STRUCTURE FOR CHANGING BODIES OF MOTORCYCLES

Technical Field

The present invention relates generally to the field of motorcycle structure for body switching.

Background Art

Up to now in Thailand, transportation by motorcycles has been an important al-ternative because motorcycles are not expensive and allow riders to travel in and out of various areas quickly. At present electric motorcycles are gaining popularity, decreasing travel expenses and helping protect the environment.

In addition, the domestic moto cycle market has grown steadily over the years. The number of motorcycles per capita in Thailand is about 1/4. This is a rapid increase from the ratio of 1/8 about 10 years ago. (Kasikom Research Center: 2010)

In all structural designs of conventional moto cycles at present, the body frame is always firmly fixed to the motorcycle's body. It follows that a change in the body of the motorcycle for any reason would necessitate a replacement in the body frame as well, thus creating substantial industrial waste. Furthermore, in case either the motorcycle body or the body frame suffers irreparable damage, removal and replacing just the damaged part would be unduly difficult.

The inventors have been inspired to conceptualize solutions to these problems by automobiles with separate car frames and body assembly such that both parts are replaceable. After much experimentation with motorcycles, the inventors finally came up with practical solutions on the design of motorcycle body frame that would allow easy swapping out the motorcycle body. In case a new body design is introduced, it would save both time and cost to the manufacturer, and to the consumer as well, since one can simply replace the old body on the existing frame.

Summary of the Invention

It is an objective of the present invention to provide a structural design that allows a lay person to change the body of a motorcycle in a short time without the help of an expert technician.

One aspect of the disclosed in-vention is directed towards a structure of ~~the~~ a frame and a body of a motorcycle that allows removal~~ing~~ or switching the body from the frame of the motorcycle. This structure comprises three gr-oups of mounting points on the frame between the motor-cycle's frame and body. One group of mounting points is located substantially ~~on~~ along a~~the~~ sagittal plane (110), which passes the axial length (passing the centers of the two wheels) of the motorcycle. Another group of mounting points comprises a single pair of mounting points, each member of the pair being spaced apart from each other and located either side of the sagittal plane and substantially along a vertical ~~(111) is located substantially on the~~ plane perpendicular (111) to the

axial length of, and at a front portion of the motorcycle and preferably~~entially~~ above the center of the front wheel. Another group of mounting points (112) is located substantially on ~~the~~ a vertical plane perpendicular to the axial length of the motorcycle and ~~preferentially~~ above or in front and above the center of the rear wheel.

Examples of mounting points that are located substantially on the sagittal plane (110), which passes the axial length (passing the centers of the two wheels) of the motorcycle comprises mounting point one (200), mounting point two (201), mounting point three (202), mounting point four (203), and mounting point eleven (210).

Examples of mounting points that are located substantially on the plane perpendicular to the axial length of the motorcycle and preferentially above the center of the front wheel (111) comprises mounting point five (204) and mounting point six (205).

Examples of mounting points that are located substantially on the plan perpendicular to the axial length of the motorcycle and preferentially above or in front and above the center of the rear wheel. (112) comprises mounting point seven (206), mounting point eight (207), mounting point nine (208), and mounting point ten (209).

There must be least one mounting point between the motorcycle's frame and the motorcycle's body in each of the three groups of mounting points mentioned above.

Each mounting point in the above examples is the point where the motorcycle body is fastened to the frame structure. If the body is bolted to the frame, the bolt size must be between 5 mm to 12 mm or 1/2 to 1 inch. In case the 5 mm mounting bolt are used, they must have a minimum proof load ofless than or equal to 225x106 Pascal and must withstand a minimum tensile strength of at least 400x106 Pascal. The bolt size can be larger than 5 mm, with corresponding changes in the minimum proof load and the minimum tensile strength. Alternatively, the motorcycle body can be fastened to the structural frame at each mounting point by any secure means other than bolts. The disclosed invention is applicable to ordinary motorcycles (with internal combustion engines) as well as electric and hybrid motorcycles.

The use of the word "a" or "an" when used in conjunction with the term "comprising" in the claims and/or the specification may mean "one," but it is also consistent with the meaning of "one or more," "at least one," and "one or more than one."

The various purposes and characteristics of these and other aspects of this invention will be more apparent when considered together with th-e attached drawings and the details of the invention in the best form which will be further described.

Brief Description of Drawings

The following drawings form part of the present specification and are included to further demonstrate certain aspects of the present invention. The present invention may be better

Claims

1. A structure of a~~the~~ frame and a body of a motorcycle that allows removal~~ing~~ or switching the body from the frame characterized in that the frame~~by~~ comprises~~ing~~ three groups of mounting points between the motorcycle's frame and body: one group of mounting points ~~is~~ being located substantially ~~on~~ along a~~the~~ sagittal plane (110), which passes the axial length (pas~~-~~sing the centers of the two wheels) of th~~-~~e motorcycle; one group of mounting points ~~(111)~~ comprising a single pair of mounting points, each member of the pair being spaced apart from each other and ~~is~~ located either side of the sagittal plane and substantially ~~on~~ along ~~the~~ a vertical plane perpendicular (111) to the axial length of, and at a front portion of the motorcycle and preferably~~entially~~ above the center of the fron~~-~~t wheel; one group of mounting points (112) ~~is~~ being located substantially on ~~the~~ a vertical plane perpendicular to the axial length of the motorcycle and ~~prefere tially~~ above or in front and above the center of the rear wheel.

2. The structure according to claim 1, wherein the group of mounting points located substantially on the sagit~~-~~tal plane (110), ~~which passes the axial length (passing the two centers of the wheels) of the motorcycle~~ comprises mounting point one (200), mounting point two (201), mounting point three (202), mounting point four (203), and mounting point eleven (210).

3. The structure according to claim 1, wherein the group of mounting points located substantially on the vertical plane perpendicular to the axial length of the motorcycle and preferably~~entially~~ above the center of the front wheel ~~(111)~~ comprises mounting poin~~-~~t five (204) and mounting point six (205).

4. The structure according to claim 1, wherein the group of mounting points located substantially on the vertical plane perpendicular to the axial length of the motorcycle and preferably~~entially~~ above or in front and above the cen~~-~~ter of the rear wheel~~.~~, ~~(112)~~ comprises mounting point seven (206), mounting point eight (207), mounting point nine (208), and mounting point ten (209).

5. The structure according to any one of claims 2 - 4, inclusive, wherein there must be at least one mounting point between the motorcycle's frame and the motorcycle's body in each of the three groups of mounting points.

6. The structure according to any one of claims 2 - 4, inclusive, wherein each mounting point is bolted to fasten th~~-~~e motorcycle body to the frame structure.

7. The structure according to claim 6, wherein the bolt size must be between 5 mm to 12 mm or 1/2 to

1 inch, which is equivalent to 1.27 cm to 2.54 cm.

~~8. The structure according to any one of claims 2 – 4, inclusive, wherein the motorcycle body is fastened to the structural frame at each mounting point by any secure means other than bolts.~~

8~~9~~. The structure according to any one of claims 6 - 7, inclusive, wherein the 5 mm, the smallest size, mounting bolt must have a minimum proof load of less than or equal to 225x106 Pascal and must withstand a minimum tensile strength of at least 400x106 Pascal.

9~~10~~. The structure according to claim 8~~9~~, wherein the bolt size can be larger than 5 mm, with corresponding changes in the minimum proof l~~-~~oad and the minimum tensile strength.

10~~11~~. The structure according to claim 1, wherein the motorcycle comprises ordinary motorcycles (with internal combustion engines), electric motorcycles and hybrid motorcycles.

11. The structure as claimed in any one of the preceding claims, wherein the total number of mounting points located on the frame is 11.