



(51) International Patent Classification:
B62J 17/06 (2006.01)

(21) International Application Number:
PCT/IN2010/000319

(22) International Filing Date:
19 May 2010 (19.05.2010)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
1187/CHE/2009 25 May 2009 (25.05.2009) IN

(71) Applicant (for all designated States except US): **TVS MOTOR COMPANY LIMITED** [IN/IN]; No. 29, Haddows Road, Chennai 600 006, Tamilnadu (IN).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **BASHA SHAIK, Mohammed** [IN/IN]; Research & Development, Tvs Motor Company Limited, "Jayalakshmi Estates", No. 24 (old No.8), Haddows Road Chennai 600 006 Tamilnadu (IN). **THANIKACHALAM, Gunalan** [IN/IN]; Research & Development, Tvs Motor Company Limited, "Jayalakshmi Estates", No. 24 (old No.8), Haddows Road Chennai 600 006 Tamilnadu (IN). **RAJWADE, Amit** [IN/IN]; Research & Development, Tvs Motor Company Limited, "Jayalakshmi Estates", No. 24 (old No.8), Haddows Road Chennai 600 006 Tamilnadu (IN). **GURAVIAH, Anu-malasetty** [IN/IN]; Research & Development, Tvs Motor Company Limited, "Jayalakshmi Estates", No. 24 (old No.8), Haddows Road, Chennai 600 006 Tamilnadu (IN). **NAGENDRASWAMY, Mahadevaswamy** [IN/IN]; Advanced Engineering Group, Tvs Motor Company Limited,

"Jayalakshmi Estates", No. 24 (old No.8), Haddows Road Chennai 600 006 Tamilnadu (IN).

(74) Agents: **VAIDYANATHAN, Alamelu** et al.; 451, 2nd Cross, 3rd Block, 3rd Stage, Basaveshwaranagar, Bangalore 560 079, Karnataka (IN).

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

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

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

[Continued on next page]

(54) Title: AUDIO SYSTEM ARRANGEMENT IN A TWO WHEELER

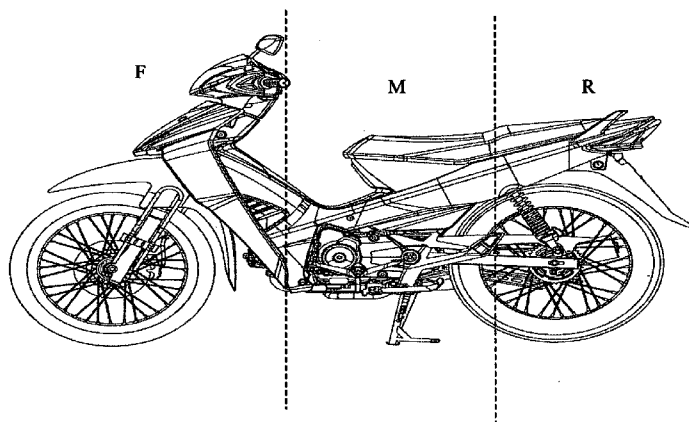


Fig.1

(57) Abstract: The present invention relates to an 'Audio system arrangement in a two-wheeler' and more particularly to an audio system arrangement for a step through type motorcycle. The current invention relates to an arrangement containing an audio system, speakers and control panel along with an input device mounted on a vehicle, especially on a motorcycle.



— *of inventorship (Rule 4.17(iv))*

Published:

— *without international search report and to be republished
upon receipt of that report (Rule 48.2(g))*

AUDIO SYSTEM ARRANGEMENT IN A TWO WHEELER

FIELD OF THE INVENTION

The present invention relates to an 'Audio system arrangement in a two-wheeler' and more particularly to an audio system arrangement for a step through type motorcycle. The current invention relates to an arrangement containing an audio system, speakers and control panel along with an input device mounted on a vehicle, especially on a motorcycle.

DISCUSSION OF PRIOR ART

10 In recent years, automotive vehicles are equipped with various electronic gadgets for user's convenience and entertainment purpose like FM receiver, Cassette player, Compact Disc (CD) player on the vehicle. These parts were mounted on the user's convenience place based on the individual choices, as it is used to be an accessory.

15 In installing such devices, it is necessary to keep high operability of those devices without impairing the robustness and the drivability of the motorcycle per se. Protection of those devices from environmental conditions, to ensure the operation of the system with all vehicle running conditions like vibration, electrical noises, mechanical shocks and no security against theft.

With the advent of digital music players, many holders and docking stations are also proposed. For example, US application published under no. 20050147951 proposes an apparatus that can secure an electronic device and be inserted into a conventional cup holder is described. The cup holder, for example, is inside of an automobile.

25 In two wheelers especially, it is difficult to place the music player itself or have specialized mounting devices. Further the operation of device becomes difficult during driving. In addition, it is desirable to obtain high quality of characteristics of the sound and reliability of entire system with motorcycle.

Conventionally, it is well known to provide a motorcycle with an audio system, in which there is, an amplifier and FM receiver with all controls on the panel of the music player unit. The locations of the player unit to arrange a player unit of the system in front of a seat and, at the same time, to arrange speakers at left and right sides of an instrument panel display portion, which performs a display of a speed and the like on a front central portion of a vehicle body. Japanese Publication
5 No. JP2002145154 describes one such arrangement wherein the tuner unit will be placed under the seat.

In the above-mentioned known audio system, in view of the relationship between the player unit and a mounting space of the player unit, a pair of speakers, and switch cluster is integrally
10 incorporated in the player unit. Audio input data, which is read from a media such as a cassette tape or compact disc (CD), is decoded and amplified by the player unit and output is fed to speakers, thereafter, output sounds from speakers.

In order to permit a rider to enjoy sophisticated music while touring or in remote place with a motorcycle (preferably when parked), it is necessary to provide an audio system, on the
15 motorcycle, which can exhibit at least a predetermined level of performance. However, in the conventional audio system, which integrally incorporates the speakers, and switch cluster in the player unit, the main drawback is to provide exact location for tuner unit to ensure its predetermined function with all vehicle and environmental conditions.

The main draw back of this system is mounting of the speakers near handle bar, making speakers' water and dust proof, as water and dust entry to the speaker which result in functionally failure of
20 speaker which results in high cost of replacement.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention to provide an audio system arrangement for a
25 motorcycle overcoming the above problems.

It is a further object of the present invention to provide a tuner unit located in cover which covers the main pipe upper of a step thru' motorcycle, which provides the user to have the convenience of using the audio system to his benefit in an effective way without using cassette or compact disc (CD).

- 5 More particularly, the present invention relates to an audio system arrangement structure in which a pair of speakers, USB socket, Ear phone sockets and switch cluster is located at a portion of a motorcycle which is separate and spaced apart from a main player unit or control unit, which has been powered by the vehicle battery itself when the vehicle is in the parked condition. The music player is placed below the cover which covers the main pipe and the accessories like speakers,
- 10 USB sockets, Earphone sockets and switch cluster are provided on the openings provided on the Cover Main Pipe.

The audio system is upgraded for adopting the automotive requirements. The player unit, switch cluster and speakers are made water and dust proof. The tuner unit designed to work with 12V DC system. Which is predominantly used voltage

15

BRIEF DESCRIPTION OF DRAWINGS

Fig. 1 illustrates a conventional step through motorcycle;

Fig. 2 illustrates the perspective view of the cover main pipe structure with tuner unit arrangement of the present invention;

- 20 Fig. 3 illustrates the inside view of the cover main pipe structure with the tuner unit arrangement of the present invention;

Fig. 4 illustrates the top view of the cover main pipe structure;

Fig. 5 illustrates the left side view of the cover main pipe structure;

Fig. 6 illustrates the mounting/housing for the switch cluster used in the tuner unit arrangement;

- 25 Figs. 7a and 7b illustrate USB and jack housing top and cross sectional views;

Fig. 8 illustrates the speaker unit;

Fig. 9 illustrates the switch cluster; and

Fig. 10 illustrates the sectional view of the switch cluster housing illustrated in Fig. 6.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

- 5 Any known motorcycle, as illustrated in fig. 1, can be divided into three major portions, the front portion **F**, the middle portion **M** and the rear/tail portion **R**. The front portion **F** comprises of the steering, front wheel with necessary brakes, front suspension and fender, the middle portion **M** comprises of the step through portion, rider seat, foot rest for both the rider and the pillion member, engine, gear shift lever stand etc and the rear/tail portion **R** comprises of petrol tank,
10 swinging arm, back wheel and suspension and rear fender.

The embodiment of the present invention will now be described with reference to Figs. 2 through 10.

- The triangular shaped cover main pipe structural member (1) of the step through motorcycle is provided with a switch cluster housing (2) wherein the switch cluster (3) is housed. The cover
15 main pipe structural member (1) is provided with three mounting holes (4, 5 and 6), of which two (4 and 5) are placed on the top and one (6) in the bottom of the said structural member (1). The ignition cum steering lock (14) is placed on the right side of the said structural member. The left side carries a provision to house a mobile charger (7) and a housing for the USB port and Jacks of the ear phone (8). Two types of jacks are provided one for the pillion rider and the other with a
20 provision to cut off sound to independent speakers.

Below the mobile charger on one side and the ignition cum steering lock on the other side, provision is made to house two speakers (9 and 10). A mounting bracket (11) is fastened on the inner side along with a housing for the switch cluster (2) and the tuner unit (15).

- 25 The frame mounting bracket (11), which is U shaped is fitted on to the structural member extending forward with two arms and welded with a weld nut to be fitted on to the frame. Reference numerals (9A) and (10A) are circular openings formed in the structural member and positioned above the switch cluster, one on either side of the switch cluster wherein the speakers

(9) and (10) are housed. Reference numeral (7A) is a circular opening formed in the structural member and positioned on the top left corner and above the left speaker opening (9A) so as to house a mobile charger. Reference numeral (8A) is a rectangular opening formed in the structural member positioned on top left corner and by the side of the (7A). Reference numeral (2A) is a circular opening formed in the structural member and positioned between (9A) and (10A) at the mid point.

The housing for USB port and jacks of the ear phone, illustrated in Fig 7, is a rectangular shaped housing placed next to the mobile charger opening (7A) and located on the top left portion of the structural member. The housing is in a shape of parallelogram with three openings (21,22,23) with two circular openings at the bottom with a rectangular opening at the top. Top surface is a curved surface and rectangular walls are integrally projected to make bottom surface flat. A boss is projecting beyond flat surface that is provided with a bore to receive the screw. A cover or a flap is placed over the USB housing to make it open and close or accessible.

Housing for speakers (9) and (10), illustrated in Fig. 8 is circular/cylindrical shaped housing with two longer and shorter projections wherein the longer arms are placed approximately 150 degrees apart and shorter arms placed 180 degrees apart. Top portion of the housing is provided with concentric ribs to form a grille shaped structure. The opposite side of the grille is open to allow the speakers to fit in. The longer and shorter arms are provided with openings at the end to allow fastening members to pass through.

The switch cluster (3) illustrated in Fig. 9, is what is commonly used in any tuner unit, is provided with buttons for selecting FM or MP3, forward or backward, increase or decrease volume etc.

The switch cluster housing (2) as shown in Fig. 10 has a locating pip (24) and a drain hole (25) to drain water. A mounting boss (26) is provided to mount the structural member in place.

The FM/MP3 tuner unit (15) is mounted using the tuner mounting bracket (16) and the mounting hole (17) is screwed on the main frame. Necessary provision such a screw opening is provided on the bracket (16) to place the tuner unit (15). The frame mounting bracket (11) is used to fasten

the cover on to the side covers (not shown in the drawings).

Fig. 10 illustrates the sectional view of the switch cluster housing illustrated in Fig. 6. Back side of the structural member and just below the switch cluster, two flat projections (17A) as shown in Fig. 5 are formed integrally. Mounting hole is provided on end of the projection a square. A square shaped flat bracket (17) with two perpendicular projections on either ends are formed. Two holes are provided on the projections. The structural member is made of steel. Another pair of holes is provided at bottom left and right corners respectively to mount the tuner unit.

The tuner unit here is suitable for automotive requirements. It is energized by vehicle battery and is designed to work with 12V DC system. The audio system is provided with auto power cut off to avoid complete draining of the vehicle battery when the battery voltage goes below predetermined threshold value.

The system includes provisions for using MP3 and FM receiver. The system does not have any in-built memory, but it takes the input from USB2.0, which is a known memory device and decodes the songs, which are in either MP3 or in WMA format. The control switch cluster for operating the system is separately located on the Cover main pipe structure. The said control switch gets the user input and the same is given to player unit. Based on the input received, the player unit gives the signal to other output devices. The system is having an amplifier of 20W RMS. Two speakers of 5W are provided in this system. The speakers also have audio frequency range and protected against water ingress.

Features of the system are that the player can play the songs from USB 2.0 in the MP3 format, this player contains FM Radio with auto tuning facility, auto power cutoff feature, inbuilt 20W RMS stereo amplifier, water and dust proof speakers, upgraded player unit to adopt automotive requirements, water and dust protected player unit and switch cluster, soft feel control switches for ease and convenience, with the options of volume Up and down, fast forward and reverse (Previous and Next), mode selection (MP3 and FM), dual earphone sockets for both rider and pillion rider and it can be adaptable with mobile phones with additional card (Jack)

The audio system assembly is located in Cover main pipe structure, which is placed between the seat and handle bar assembly of a step thru' motorcycle. The said cover main pipe structure covers the main frame of the motorcycle. The audio system assembly includes a player unit, control switch cluster, speakers, USB and Earphone sockets.

- 5 The switch cluster is having control buttons to perform the various functions of tuner unit. Like volume up and down, next and previous, power ON/OFF. And Play/Pause etc. The supply for the switch cluster is being from player unit. The switch output is fed to player unit and player unit in turn controls the function. The location of this unit is on the middle part of the said Cover main pipe structure.
- 10 The audio output from the player unit is fed to the speakers to produce sound of certain frequencies. The location of this unit is on the left and right upper part of the said Cover main pipe structure.
- 15 : USB is a storage device and the player unit does not have inbuilt memory. Hence USB drive is required to play songs from MP3 player. Earphone sockets are provided for additional convenience. From the said earphone sockets, user can use earphones to listen to the music. The USB socket and earphone sockets need a Holder for holding the sockets. The location of Holder unit is on the left / right top most part of the said Cover main pipe structure.

20

25

30

35

Claims:

1. A retrofittable top cover main pipe structural member for a two wheeler located below the handle bar covers, said structural member having provision for mounting audio system accessories comprising, a switch cluster housing having a switch cluster, said switch cluster housing fastened to the middle portion of the said structural member, a pair of openings for housing speakers on both left and right side of the said structural member, an opening for housing a mobile charger on the top left of the said structural member along with an opening for housing two jacks for ear phone and a USB port, said structural member being provided with three mounting holes (4, 5,6) of which two are placed on the top and one in the bottom of the said structural member.
2. The retrofittable top cover main pipe structural member as claimed in claim 1 includes a tuner-mounting bracket (16) with a mounting hole.
3. The retrofittable top cover main pipe structural member as claimed in claim 1 where each of the audio system accessories is water and dust proof.
4. The retrofittable top cover main pipe structural member as claimed in claim 1 where the switch cluster housing comprises of a locating pip, drain hole and a mounting boss.
5. A two wheeler including a retrofittable top cover main pipe structural member for a two wheeler located below the handle bar covers, having provision for mounting audio system accessories comprising, a switch cluster housing having a switch cluster, said switch cluster housing fastened to the middle portion of the said structural member, a pair of openings for housing speakers on both left and right side of the said structural member, an opening for housing a mobile charger on the top left of the said structural member along with an opening for housing two jacks for ear phone and a USB port, said structural member being provided with three mounting holes (4, 5,6) of which two are placed on the top and one in the bottom of the said structural member.

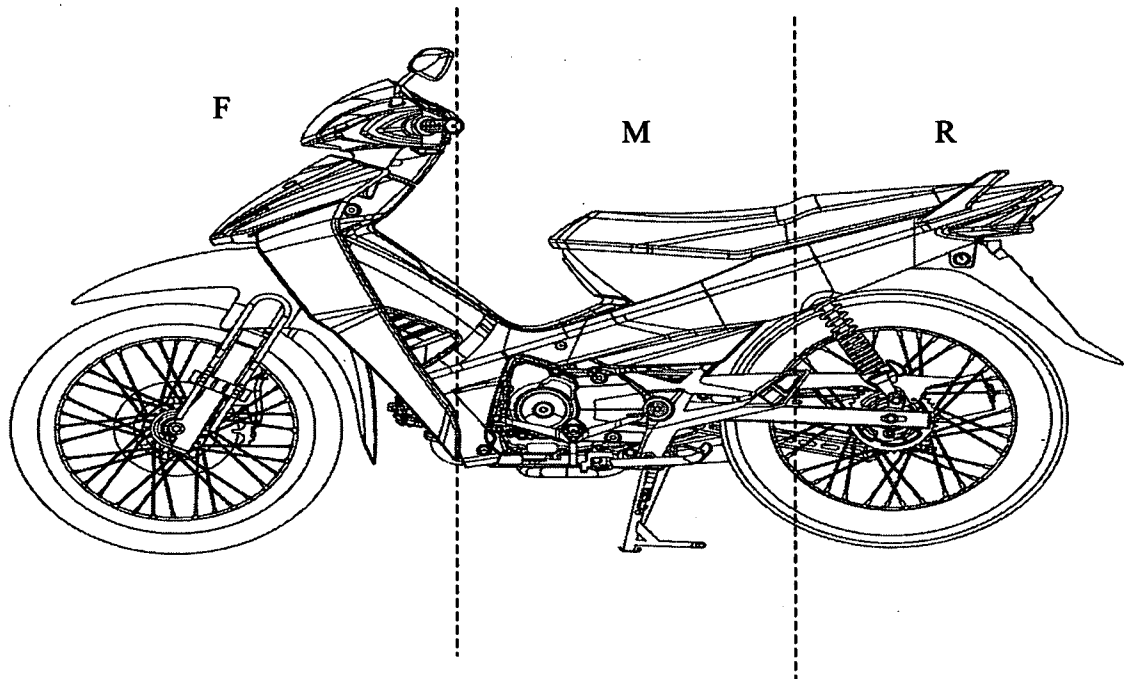


Fig. 1

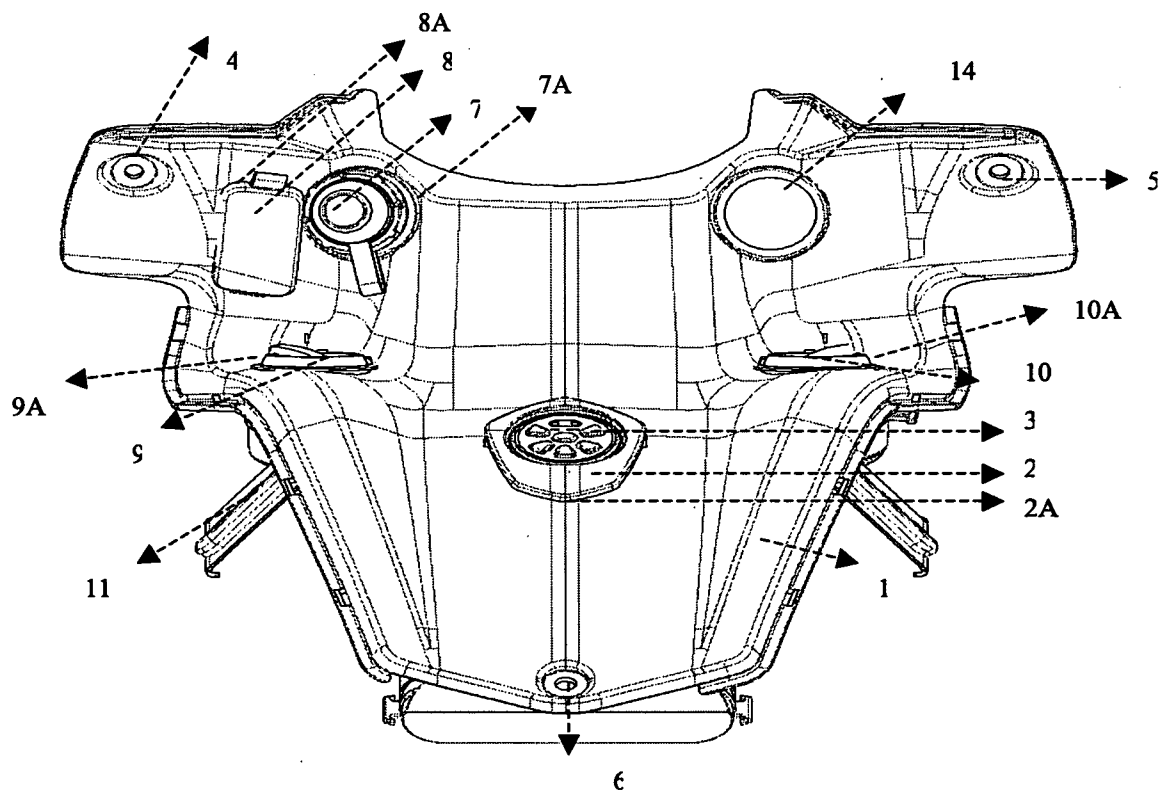


Fig. 2

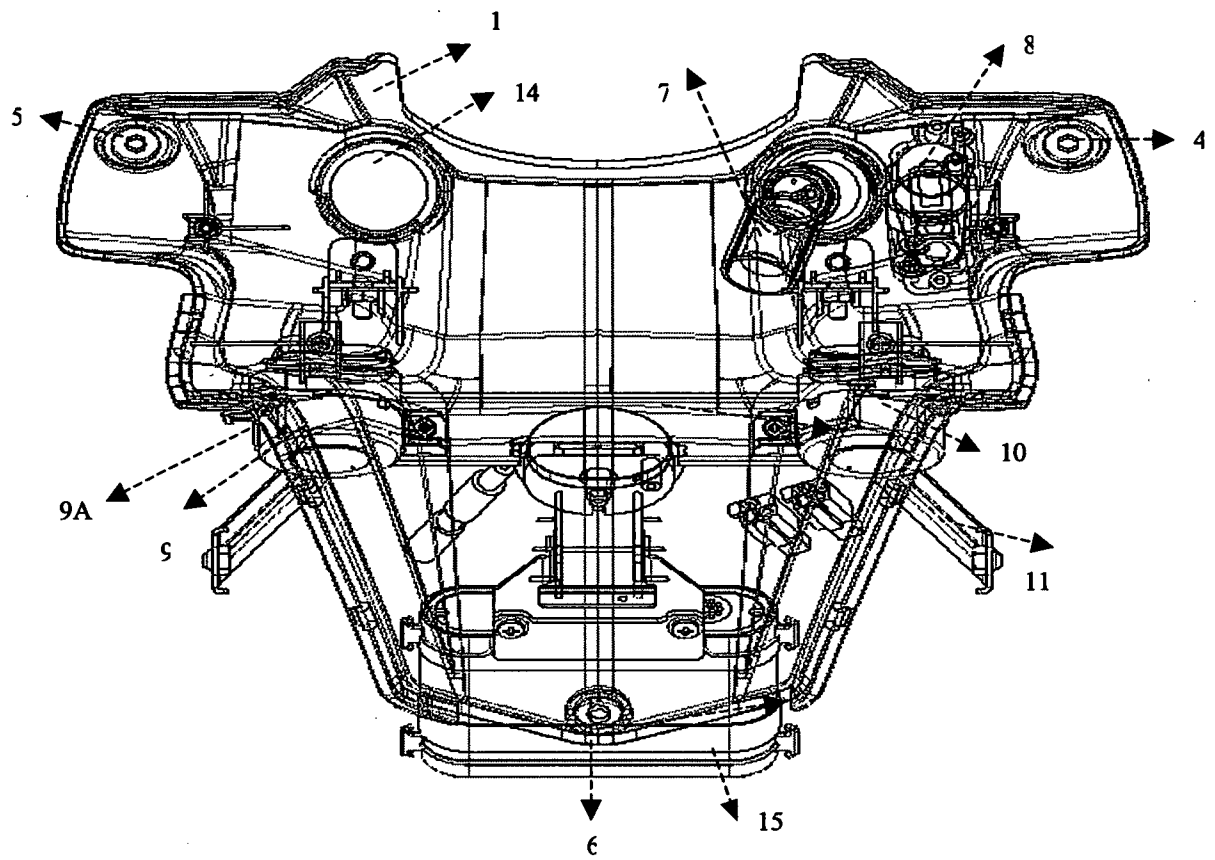


Fig. 3

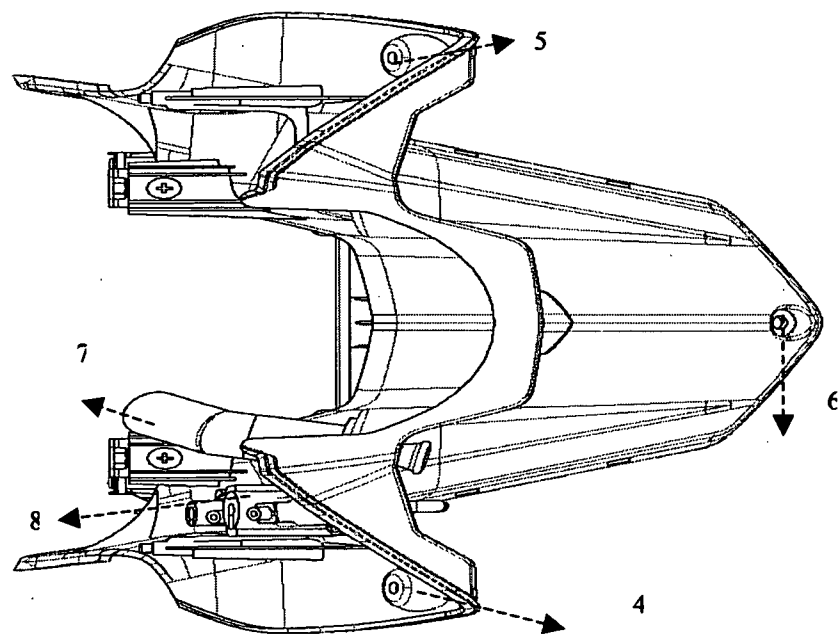


Fig. 4

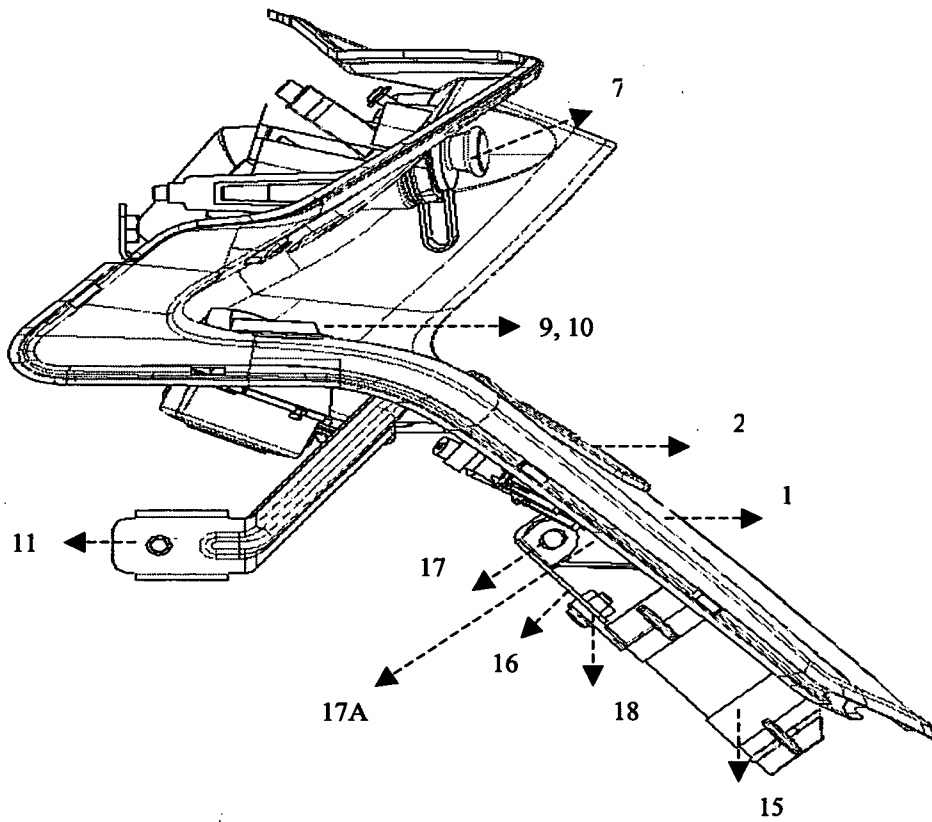


Fig. 5

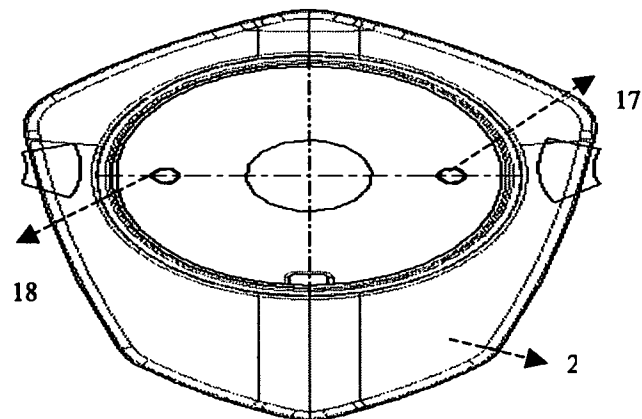
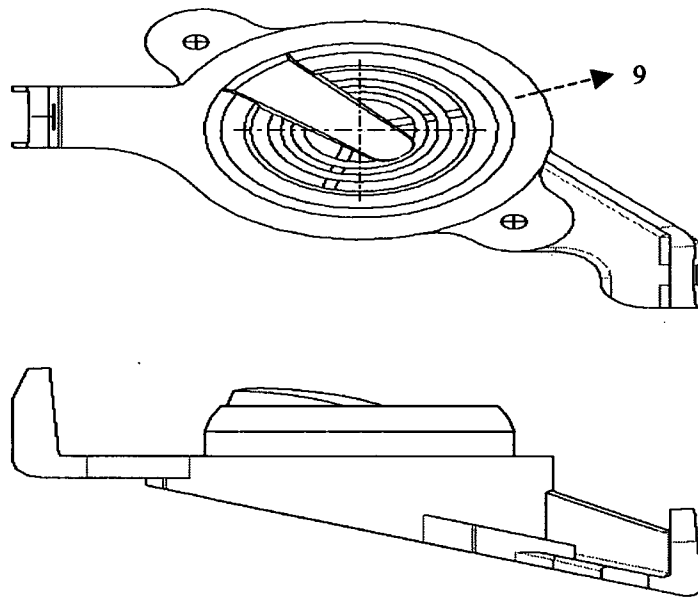
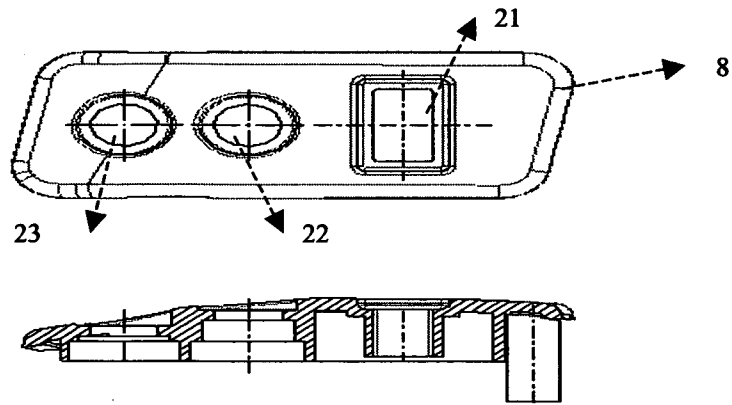


Fig. 6



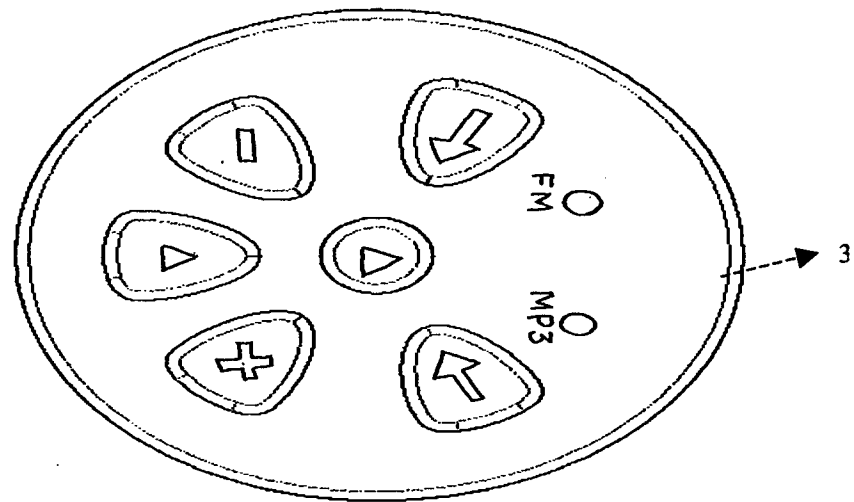


Fig. 9

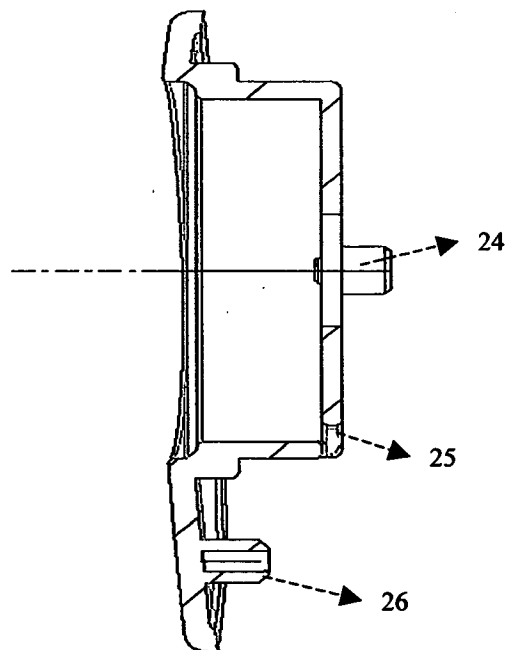


Fig.10