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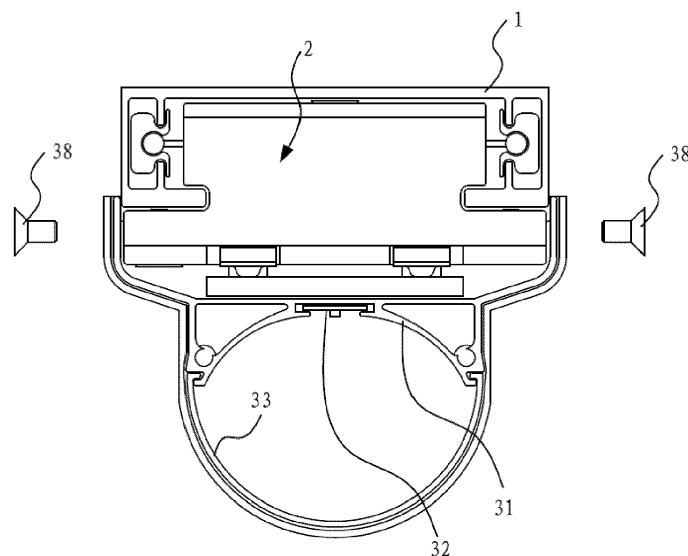
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(54) **A LED LAMP WITH GUIDE RAIL**

(57) The present invention provides a LED lamp with guide rail comprising a power supply rail, a power supply unit and a lamp body. The lamp body comprises a reflective bracket, a LED light bar and a lampshade. The power supply unit is divided into an upper part and a lower part and a wrapping part is arranged on edge of the back of the reflective bracket. The wrapping part is fixed on the lower part of the power supply unit through a bolt. The lampshade is connected to the front surface of the reflective bracket and covers the LED light bar. The power supply unit transmits power to the LED light bar after taking power from the power supply rail. The beneficial effects of the present invention are that, because the

lamp body of the present invention is fixed on the power supply unit by the wrapping part at the backside of the reflective bracket and the bolt can easily be tightened and unscrewed, it is easier to perform installation operations on the lamp body and thus improve the installer's work efficiency. Meanwhile, because the power supply rail and power supply unit of the invention can be manufactured in accordance with a standard specification, lamp bodies with different sizes can be fitted through the power supply rail by only producing different specifications of the corresponding reflector brackets and lampshades, which thus can meet the different needs of different people.



**Fig. 3**

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**Description****FIELD OF THE INVENTION**

[0001] The present invention relates to lighting equipment, in particular to a LED lamp with guide rail.

**BACKGROUND OF THE INVENTION**

[0002] Nowadays, lighting products are largely needed to be used in supermarkets, shopping malls, conference halls and other large places. Currently, these places usually use ordinary fluorescent lamps. But ordinary fluorescent lamps have some disadvantages. Firstly, they cost large energy consumption because energy consumption of ordinary fluorescent lamp is four times the energy consumption of LED lamp. Secondly, they are fragile because the ordinary fluorescent lamps are made of glass and glass lamps are easily broken after being hit. Thirdly, they have environmental problem because ordinary fluorescent lamps contain mercury which can cause pollution. Fourthly, they are dangerous because ordinary fluorescent lamp use 220V AC and such a high voltage may cause harm to human life. Fifthly, their have short life and such ultralow lamp life makes frequent maintenance.

[0003] Currently, there are some products using LED illuminant as lighting source. However, these lamps did not fundamentally get rid of the model of the traditional lamp which needs to set a plurality of grooves in the ceiling and then mount the lamp into the grooves. It is inconvenient to install the lamps in the grooves and the position of the lamp is substantially fixed after the installation. Moreover, in a large place, the linear of the lamp is not enough after the installation will cause the light band bend because the light band is too long. This can impact the overall senses of the supermarket and be increasingly criticized by many customers with high demands in the pursuit of details and the perfect atmosphere.

[0004] For this problem, in the prior art, someone began to use the guide rail technology to supply power. This thus can obtain a sufficiently good linear LED lamp after the installation. But ordinary guide railed lamp has such a problem that the installation is very inconvenient due to the usually complex structure. Due to this, the market for the guide railed lamp is always not good and the cost is always very high.

[0005] Further, the conventional LED lamp with guide rail can only be installed with one shaped LED lamp body after the rail is determined because the lamp body is required to match with the guide rail. Thus, the lamp form is single and cannot meet the diverse needs of users.

**SUMMARY OF THE INVENTION**

[0006] The present invention intends to solve one or more of the above problems and thus provides a LED lamp with guide rail which can be installed easily and can allow change of the shape of the lamp body.

[0007] According to the present invention, a LED lamp with guide rail comprises a power supply rail, a power supply unit and a lamp body. The lamp body comprises a reflective bracket, a LED light bar and a lampshade;

[0008] The overall structure of the power supply rail is a groove-shaped structure and the interior of the power supply rail is a groove.

[0009] The power supply unit can be movably arranged on the power supply rail. The overall structure of a section of the power supply unit is a I-shaped structure. The power supply unit is divided into an upper part and a lower part with the upper part of the power supply unit being located in the groove and the lower part of the power supply unit being located outside the groove of the power supply rail.

a wrapping part is arranged on edge of the backside of the reflective bracket. This wrapping part is fixed on the lower part of the power supply unit through a bolt.

[0010] The LED light bar is connected onto the reflective bracket.

[0011] The lampshade is connected to the front surface of the reflective bracket and covers the LED light bar.

[0012] The power supply unit transmits power to the LED light bar after taking power from the power supply rail.

[0013] The beneficial technical effects are as follows: the lamp body of the present invention is fixed on the power supply unit by the wrapping part on the backside of the reflective bracket and the power supply unit is mounted inside the power supply rail. Because the wrapping part is fixed on the power supply unit through the bolt, the bolt can be easily tightened and unscrewed. Therefore, it's easy to perform installation operations on the lamp body which thus improves the installer's work efficiency.

[0014] Meanwhile, the power supply rail and power supply unit of the invention can be manufactured in accordance with a normal standard. The lamp body with different sizes can be fitted through the power supply rail by only producing different specifications of the corresponding reflector brackets and lampshades, which thus can meet the different needs of different people.

[0015] The lamp body according to the present invention is supplied from the power supply rail. Because the power supply rail is usually made of metal profile and metal profile is stretch-formed through a mold at the time of production, the straight effect can be achieved in a certain scope of length. Thus, at the time of installation, the technical effect of the linear straight can be achieved after the installation of the lamp.

[0016] Meanwhile, the lamp body can easily be moved along the power supply rail since it can obtain power from the entire power supply rail without needs to change the position of the rail, which is more convenient. Furthermore, the light emitted by the LED light bar, which is fully radiated and concentrated by the reflective bracket and then comes out through the lampshade, makes the lighting of the entire lamp even and soft. Meanwhile, the re-

flective bracket can be made of full aluminum. The reflective bracket made of full aluminum material can provide a greater heat dissipation area for LED light bar, which makes the power of LED lamp higher.

**[0017]** In some embodiments, the power supply rail comprises a top plate, two outer plates and two inner plates. The top of the outer plate and the inner plate are fixed onto the top plate. The bottom of inner plate and the outer plate are provided with a semi-closed groove which is formed by surround of a support plate, the top plate, the outer plate, the inner plate and the support plate. This groove is used to accommodate the upper part of the power supply unit. The beneficial effect of such a structure is that, because the upper part of the power supply unit is located within the groove, the power supply unit can be supported by the support plate and will not fall from the groove. Meanwhile, the power supply unit is allowed to easily move along the power supply rail in the longitudinal direction thereof.

**[0018]** In some embodiments, the inner plate is provided with a first slot thereon. This first slot is provided with an insulating slot strip. The opening of the insulating slot strip faces toward the groove and the insulating slot strip is provided with a conductive wire therein. The beneficial effects of this structure are as follows: it's very dangerous and unsafe for supplying power directly through the body of the power supply rail due to the body of the entire power supply rail is usually made of metal profiles. However, such a technical solution of arranging an insulating slot strip on the first slot of the inner plate and then arranging the conductive wire in the insulating slot strip can allow the power supply rail to achieve the function of power supply. At the same time, because the conductive wire is disposed in the insulating slot strip, the body of the power supply rail, i.e., the top plate, outer plate, inner plate and the support plate are electrically neutral and there will be no risk of leakage and electric shock. The insulating slot strip is a rubber slot strip usually with certain flexibility, therefore the rubber slot strip can be stuck in the first slot more convenient and more stable. Meanwhile, because the rubber slot has a large coefficient of friction, it can grip the conductive wire very tightly and prevent the conductive wire from falling out of the rubber slot.

**[0019]** In some embodiments, the section of the insulating slot strip is a "Ω" shaped structure. The insulating slot strip comprises a base, two first connecting portions and two second connecting portions. One end of two first connecting portions are connected to two ends of the base and the other end of the first connecting portion is connected to the second connecting portion. A bayonet is formed after connecting the first connecting portion and the second connecting portion. This bayonet is clamped on the inner plate of both sides of the first slot. The first connecting portion covers a side of the inner plate and the second connecting portion covers the other side of the inner plate. The beneficial effect of this arrangement is that, the conductive wire may be located

inside of the Ω-shaped structure so that the conductive wire can be fixed to the insulating rubber strip tightly. Meanwhile, a larger insulating region can be created through covering the both sides of the inner plate by the first connecting portion and the second connecting portion and thus the conductive wire certainly cannot access to the inner plate, which prevent the possibility of leakage and electric shock.

**[0020]** In some embodiments, the power supply unit comprises a top cap, a housing and a bottom cap. The interior of the housing is provided with a space for accommodating a driving power supply. The top cap is covered on the housing and the bottom cap is arranged at the bottom of the housing. An outside wall of the housing is provided with a fixed groove and this fixed groove cooperates with the support plate to enable the power supply unit to be fixed onto the power supply rail. The beneficial effects of such arrangement are that, the top cap, housing and bottom cap are made of insulating materials, which can ensure the housing of the power supply unit is isolated from the conductive wire, and at the same time, the entire power supply unit is mounted on the power supply rail with the cooperation of the fixed groove and the support plate and thus cannot fall down.

**[0021]** In some embodiments, the housing comprises a first portion and a second portion. The fixed groove is located in the junction between the first portion and the second portion. The width of the second portion is greater than a width of the first portion. A side of the second portion is provided with a fixed hole matched to the bolt. The beneficial effects from such arrangement are that: it is easier to install by fixing the wrapping part on the fixed hole via the bolt and thus it can be installed and removed easily because the second portion of the housing is located outside of the groove.

**[0022]** In some embodiments, the first portion is provided with a first notch on its two sides corresponding to a side wall of the power supply rail. The first notch is provided with a first conductive sheet with one end of the first conductive sheet being connected to the conductive wire and the other end of the first conductive sheet being connected to the driving power supply. The beneficial effects on this are such that: the first conductive sheet is sticking out from the first notch which thus ensures only the first conductive sheet can be in contact with the conductive wire and no leakage problems will be caused. Power from the conductive wire can be supplied to the driving power supply by the connection of the first conductive sheet.

**[0023]** In some embodiments, the first conductive sheet is of "Z" shaped structure. This first conductive sheet comprises a mounting portion, an elastic portion and a contact portion. The mounting portion is used to mount the conductive sheet on the housing. The elastic portion is connected onto the mounting portion and the contact portion is in contact with the conductive wire. The contact portion is connected onto the elastic portion. The housing is provided with a retaining wall cooperated with

the elastic portion. One side of the retaining wall which is facing to the elastic portion is a slope. The distance between one end of the elastic portion which is near the mounting end portion and the retaining wall is less than a distance between one end of the elastic portion which is near the contact portion and the retaining wall.

**[0024]** One end of the contact portion which is in contact with conductive wire is provided with an arcuate edge.

**[0025]** The beneficial effects of the above are such that: the first conductive sheet on both sides are pressed in the direction towards the retaining wall when installing due to the first conductive sheet has an elastic portion. Therefore, the elastic portion is deformed and then the contact portion can be inwardly recessed at the first notched. The width of the entire power supply unit becomes slightly narrower so that the first conductive sheet may be just located between the two conductive wires. Meanwhile, because the elastic portion has elastic force, the contact portion can be in contact with the conductive wire closer which ensure the conductivity effect.

**[0026]** In some embodiments, the bottom of the driving power supply is connected with a second conductive sheet. The bottom cap is provided with a second notch thereon. One end of the second conductive sheet which is away from the driving power supply cooperates with the second notch. A position of the second conductive sheet which is near the second notch is arcuate folded. One end portion of the second conductive sheet which is near the second notch is provided with a conductive contact. The beneficial effects in this regard are such that: the elasticity of the second conductive sheet can be increased after setting this arcuate fold. Therefore, the conductive contact has a greater downward pressure and the second conductive sheet can transmit the current converted through the driving power supply to the LED light bar.

**[0027]** In some embodiments, the reflective bracket further comprises a radiating back plate, two side plates and an arcuate reflective plate. The two side plates, the radiating back plate and arcuate reflective plate surround together to form a hollow space. The radiating back plate and the wrapping part is of an integrated structure. An inside surface of the arcuate reflective plate is provided with a second slot with the LED light bar being stuck in the second slot. Two sides of the arcuate reflective plate are provided with a third slot and two sides of the lampshade are provided with an edge and this edge is stuck in the third slot.

**[0028]** The beneficial effects of the above are such that: a hollow space is used to save material which can make the reflective bracket lighter and can facilitate the installation. The wrapping part on the entire reflective bracket further increase the area of the entire reflective bracket which thereby increases the radiating area and improve the radiating effect.

**[0029]** Each lamp body can be equipped with two power supply units and the two power supply units are located

at both ends of the lamp body respectively so that the lamp body can be interposed between the two power supply units.

**[0030]** In some embodiments, the LED lamp with guide rail further comprises an end cap. The end cap comprises a body and a support plate. The support plate is fixed to one side of the body and provided with a stopper. The stopper is corresponding to the second conductive sheet. The support plate is further provided with a through hole thereon.

**[0031]** The beneficial effects of the above are such that: the lamp body can have a more confined space by using of the end cap, which can prevent the dust falling into the lampshade and ensure a good lighting effect. Meanwhile, the power supply unit can be well supported through the support plate to maintain the stability of the power supply unit. At the same time, cooperation of the stopper with the second conductive sheet can ensure that the second conductive sheet does not have displacement. The through hole on the supporting plate can be used to have the conductive wire pass through in order to facilitate the connection of the second conductive sheet and LED light bar.

## BRIEF DESCRIPTION OF THE DRAWINGS

### [0032]

Figure 1 is a schematic diagram showing the side structure of a LED lamp with guide rail according to one embodiment of the invention;

Figure 2 is a schematic diagram showing the end face of a LED lamp with guide rail according to one embodiment of the invention;

Figure 3 is a cross-sectional structural schematic diagram of a LED lamp with guide rail according to one embodiment of the invention;

Figure 4 is a structure schematic diagram of a power supply rail of the LED lamp with guide rail according to one embodiment of the invention;

Figure 5 is a partial structural schematic diagram for part A of FIG. 4;

Figure 6 is a structural schematic diagram of an insulating slot bar of the LED lamp with guide rail according to one embodiment of the present invention;

Figure 7 is a structural schematic diagram of a power supply unit of the LED lamp with guide rail according to one embodiment of the present invention;

Figure 8 is a structural schematic diagram of a top cap of the LED lamp with guide rail according to one embodiment of the present invention;

Figure 9 is a structural schematic diagram of a housing of the LED lamp with guide rail according to one embodiment of the present invention;

Figure 10 is a structural schematic diagram of a bottom cap of the LED lamp with guide rail according to one embodiment of the present invention;

Figure 11 is a structural schematic diagram of the housing of the LED lamp with guide rail according to one embodiment of the present invention, from another point of view;

Figure 12 is a structural schematic diagram of the housing of the LED lamp with guide rail according to one embodiment of the present invention, from yet another point of view;

Figure 13 is a structural schematic diagram of a first conductive sheet of the LED lamp with guide rail according to one embodiment of the present invention;

Figure 14 is a structural schematic diagram of the first conductive sheet of the LED lamp with guide rail according to one embodiment of the present invention, from another point of view;

Figure 15 is a structural schematic diagram showing the cooperation of the housing and the first conductive sheet of the LED lamp with guide rail according to one embodiment of the present invention;

Figure 16 is a structural schematic diagram of a second conductive sheet of the LED lamp with guide rail according to one embodiment of the present invention;

Figure 17 is a structural schematic diagram of a reflective bracket of the LED lamp with guide rail according to one embodiment of the present invention;

Figure 18 is a structural schematic diagram of an end cap of the LED lamp with guide rail according to one embodiment of the present invention; and

Figure 19 is a structural schematic diagram of a lampshade of the LED lamp with guide rail according to one embodiment of the present invention.

## DETAILED DESCRIPTION

**[0033]** The LED lamp with guide rail according to the present invention will be further illustrated in conjunction with Figs. 1-19 and the specific embodiments as follows.

**[0034]** As shown in figures 1, 2 and 3, the LED lamp with guide rail comprises a power supply rail 1, a power supply unit 2 and a lamp body 3. The lamp body 3 comprises a reflective bracket 31, a LED light bar 32 and a

lampshade 33.

**[0035]** An overall structure of the power supply rail 1 is a groove-shaped structure. The interior of the power supply rail 1 forms a groove 34.

**[0036]** As shown in figures 2 and 7, the power supply unit 2 is movably arranged in the power supply rail 1. An overall structure of a section of the power supply unit 2 is a I-shaped structure. The power supply unit 2 comprises an upper part 35 and a lower part 36. The upper part 35 of the power supply unit 2 is located within the groove 34 and the lower part 36 of the power supply unit 2 is located outside the groove 34 of the power supply rail 1.

**[0037]** As shown in figures 3 and 17, a wrapping part 37 is arranged at edge of the backside of the reflective bracket 31. The wrapping part 37 is fixed on the lower part 36 of the power supply unit 2 through a bolt 38.

**[0038]** The LED light bar 32 is connected onto the reflective bracket 31.

**[0039]** The lampshade 33 is connected to the front side of the reflective bracket 31 and covers the LED light bar 32.

**[0040]** The power supply unit 2 transmits power to the LED light bar 32 after taking power from the power supply rail 1.

**[0041]** The lamp body 3 of the present invention is fixed on the power supply unit 2 by the wrapping part 37 of the backside of the reflective bracket 31 while the power supply unit 2 is mounted in the power supply rail 1. Because the wrapping part 37 is fixed on the power supply unit 2 through the bolt 38 and the bolt 38 can be easily tightened and unscrewed, it's easier to perform installation operations on the lamp body 3 and thus improve the installer's working efficiency.

**[0042]** The power supply rail 1 and power supply unit 2 of the invention can be manufactured in accordance with a standard specification. With this specification, the lamp body 3 with different sizes can be fitted through the power supply rail 1 by only producing different specifications of the corresponding reflector brackets 31 and lampshades 33, which thus can meet the different needs of different people.

**[0043]** The lamp body 3 of the present invention is power-supplied from the power supply rail 1. Because the power supply rail 1 is usually made of metal profile and such metal profile is normally stretch-formed through a mold at the time of production, the straight effect can be achieved in a certain scope of length. Thus, at the time of installation, the technical effect of the linear straight can be achieved after the installation of the lamp.

**[0044]** Meanwhile, the lamp body 3 can easily be moved along the power supply rail 1 because it can obtain power from the entire power supply rail 1 without needs for change of the position of the rail 1, which is more convenient for the installer. Furthermore, the light emitted by the LED light bar 32, which is fully radiated and concentrated by the reflective bracket 31 and then comes out through the lampshade 33, makes the lighting of the entire lamp even and soft. Moreover, the reflective brack-

et 31 can be made of full aluminum and the reflective bracket 31 made of full aluminum material can provide a better heat dissipation area for LED light bar, which makes the power of LED lamp higher.

**[0045]** As shown in figures 4, 5 and 6, the power supply rail 1 of the present invention comprises a top plate 39, two outer plates 310 and two inner plates 311. The top of the outer plate 310 and the inner plate 311 are fixed onto the top plate 39. The bottom of inner plate 311 and the outer plate 310 are provided with a support plate 312. The top plate 39, the outer plate 310, the inner plate 311 and the support plate 312 surround together to form a semi-closed groove 34. The groove 34 is used to hold the upper part 35 of the power supply unit 2. Because the upper part 35 of the power supply unit 2 is located within the groove 34, the power supply unit 2 can be supported by the support plate 312 without falling from the groove 34. Meanwhile, the power supply unit 2 is allowed to easily move along the power supply rail 1 in the longitudinal direction thereof.

**[0046]** In addition, the inner plate 311 is provided with a first slot 313. This first slot 313 is provided with an insulating slot strip 314 thereon. The opening of the insulating slot strip 314 faces toward the groove 34. The insulating slot strip 314 is provided with a conductive wire 315 therein. It's very dangerous and unsafe for supplying power directly through the body of the power supply rail 1 due to the body of the entire power supply rail 1 is usually made of metal profiles. However, by arranging an insulating slot strip 314 on the first slot 313 of the inner plate 311 and then arranging the conductive wire 315 in the insulating slot strip 314, it can allow the power supply rail 1 to achieve the function of power supply. Further, because the conductive wire 315 is disposed in the insulating slot strip 314, the body of the power supply rail 1, i.e., the top plate 39, outer plate 310, inner plate 311 and the support plate 312 are electrically neutral and there will be no risk of leakage and electric shock. The insulating slot strip 314 is a rubber slot strip usually with certain flexibility and therefore the rubber slot strip can be stuck in the first slot 313 more convenient and more stable. Meanwhile, because the rubber slot has a large coefficient of friction, it can grip the conductive wire 315 very tightly and prevent the conductive wire 315 from falling out of the rubber slot.

**[0047]** In the present invention, the cross-section of the insulating slot strip 314 is a "Ω" shaped structure. The insulating slot strip 314 comprises a base 316, two first connecting portions 317 and two second connecting portions 318. One end of two first connecting portions 317 are connected to two ends of the base 316. The other end of the first connecting portion 317 is connected to the second connecting portion 318. A bayonet 319 is formed after connection of the first connecting portion 317 and the second connecting portion 318. This bayonet 319 is clamped on the inner plate 311 of both sides of the first slot 313. The first connecting portion 317 covers a side of the inner plate 311 and the second connecting

portion 318 covers the other side of the inner plate 311. The conductive wire 315 may be located inside the Ω-shaped structure so that the conductive wire 315 can be fixed to the insulating rubber strip tightly. Meanwhile, a larger insulating region can be created through covering the both sides of the inner plate 311 by the first connecting portion 317 and the second connecting portion 318 and the conductive wire 315 certainly cannot contact the inner plate 311. This can effectively prevent the possibility of leakage and electric shock.

**[0048]** As shown in figures 7, 8, 9, 10, 11, 12, 13, 14, 15 and 16, the power supply unit 2 of the present invention comprises a top cap 21, a housing 22 and a bottom cap 23. The interior of the housing 22 is provided with a space for accommodating a driving power supply (not shown). The top cap 21 is covered on the housing 22 and the bottom cap 23 is arranged at the bottom of the housing 22. An outside wall of the housing 22 is provided with a fixed groove 24 and the fixed groove 24 cooperates with the support plate 312 to enable the power supply unit 2 to be fixed onto the power supply rail 1. The top cap 21, housing 22 and bottom cap 23 can all be made of insulating materials which can ensure the housing 22 of the power supply unit 2 is isolated from the conductive wire 315. At the same time, the entire power supply unit 2 is mounted onto the power supply rail 1 with the cooperation of the fixed groove 24 and the support plate 312 and thus cannot fall down.

**[0049]** As shown in figure 9, the housing 22 of the present invention comprises a first portion 25 and a second portion 26. The fixed groove 24 is formed in the junction between the first portion 25 and the second portion 26. The width of the second portion 26 is greater than that of the first portion 25. A side of the second portion 26 is provided with a fixed hole 27 to be matched with the bolt 38. It is very easy to make installation by fixing the wrapping part 37 with the fixed hole 27 via the bolt 38 and thus these parts can be installed and removed easily because the second portion 26 of the housing 22 is located outside of the groove 34.

**[0050]** The first portion 25 is provided with a first notch 28 on its two sides corresponding to a side wall of the power supply rail 1. The first notch 28 is provided with a first conductive sheet 29 with one end of the first conductive sheet 29 being connected to the conductive wire 315 and the other end of the first conductive sheet 29 being connected to the driving power supply. The first conductive sheet 29 is sticking out from the first notch 28 and thus it ensures that only the first conductive sheet 29 can be in contact with the conductive wire 315 and no leakage problems will be caused. Power from the conductive wire 315 can be supplied to the driving power supply by the connection of the first conductive sheet 29.

**[0051]** As shown in figures 13 and 14, the first conductive sheet 29 is of a "Z" shaped structure. This first conductive sheet comprises a mounting portion 210, an elastic portion 211 and a contact portion 212. The mounting portion 210 is used to mount the conductive sheet on the

housing 22. The elastic portion 211 is connected onto the mounting portion 210. The contact portion 212 is in contact with the conductive wire 315. The contact portion 212 is connected onto the elastic portion 211. As shown in figure 15, the housing 22 is provided with a retaining wall 213 cooperated with the elastic portion 211. One side of the retaining wall 213 which is facing to the elastic portion 211 is a slope. The distance between one end of the elastic portion 211 nearing the mounting portion 210 and the retaining wall 213 is less than the distance between one end of the elastic portion 210 nearing the contact portion 212 and the retaining wall 213. One end of the contact portion 212 which is in contact with conductive wire 315 is provided with an arcuate edge 214.

**[0052]** Because the first conductive sheet 29 has an elastic portion 211, when in installation, the first conductive sheets 29 on both sides can be pressed in the direction towards the retaining wall 213 so that the elastic portion 211 is deformed. And then the contact portion 212 can be inwardly recessed at the first notched 28. The width of the entire power supply unit 2 becomes slightly narrower so that the first conductive sheet 29 could be just located between the two conductive wires 315. Meanwhile, because the elastic portion 211 has elastic force, the contact portion 212 can be in contact with the conductive wire 315 closer, which ensures the conductivity effect.

**[0053]** Moreover, one end by which the contact portion 212 is in contact with conductive wire 315 is provided with an arcuate edge 214, which can facilitate the power supply unit 2 moving on the power supply rail 1 without suffering from blocks and therefore facilitates adjustment of the installation location of the lamp body 3 on the entire LED lamp with guide rail.

**[0054]** The bottom of the driving power supply is connected with a second conductive sheet 215. The bottom cap 23 is provided with a second notch 216. One end on which the second conductive sheet 215 is away from the drive power supply cooperates with the second notch 216. As shown in figure 16, a position of the second conductive sheet 215 nearing the second notch 216 is arcuate fold 217. One end portion of the second conductive sheet 215 nearing the second notch 216 is provided with a conductive contact 21. The elasticity of the second conductive sheet 215 can be increased after arranging this arcuate fold 217 so that the conductive contact 218 has a greater downward pressure. And the second conductive sheet 215 can transmit the current converted through the driving power supply to the LED light bar 32.

**[0055]** As shown in figure 17, in the present invention, the reflective bracket 31 further comprises a radiating back plate 320, two side plates 321 and an arcuate reflective plate 322. The two side plates 321, the radiating back plate 320 and the arcuate reflective plate 322 surround together to form a hollow space. The radiating back plate 320 and the wrapping part 37 is an integrated structure. An inside face of the arcuate reflective plate 322 is provided with a second slot 323. The LED light bar 32 is

stuck in the second slot 322. Two sides of the arcuate reflective plate 322 is provided with a third slot 324, as shown in Fig. 19, two sides of the lampshade 33 is provided with a card edge 325 and the card edge 325 is stuck in the third slot 324.

**[0056]** The hollow space formed with the reflective bracket 31 is used to save material, which makes the reflective bracket 31 lighter and easier to install. The wrapping part 37 with the entire reflective bracket 31 can further increase the area of the entire reflective bracket, thereby increases the radiating area and improve the radiating effect.

**[0057]** Each lamp body 3 can be equipped with two power supply units 2 and the two power supply units 2 are located at both ends of the lamp body 3 respectively so that the lamp body 3 can be interposed between the two power supply units 2.

**[0058]** As shown in figure 18, the LED lamp with guide rail according to the present invention further comprises an end cap 326. This end cap 326 comprises a body 327 and a support plate 328. The support plate 328 is fixed to one side of the body 327. The support plate 328 is provided with a stopper 329 thereon. The stopper 329 is corresponding to the second conductive sheet 215. The support plate 328 is further provided with a through hole 330 thereon.

**[0059]** The lamp body 3 can have a more confined space through use of the end cap 326, which can prevent dusts from falling into the lampshade 33 and ensure a good lighting effect. Meanwhile, the power supply unit 2 can be well supported through the support plate 328 to maintain the stability of the power supply unit 2. Moreover, cooperation of the stopper 329 with the second conductive sheet 215 can ensure the second conductive sheet 215 does not have displacement. The through hole 330 on the support plate 328 can be used for passing through the conductive wire in order to facilitate the connection of the second conductive sheet 215 and LED light bar 32.

**[0060]** The above are only some embodiments of the present invention. One skilled in the art will readily appreciate that various variations and modifications can be made without deviating from the scope of innovative design of the present invention, which fall within the protection scope of the present invention.

## Claims

1. A LED lamp with guide rail, comprising a power supply rail (1), a power supply unit (2) and a lamp body (3), the lamp body (3) comprising a reflective bracket (31), a LED light bar (32) and a lampshade (33); the power supply rail (1) overall presenting a groove-shaped structure and interior of the power supply rail (1) forming a groove (34); the power supply unit (2) being movably arranged in the power supply rail (1), the cross-section of the

- power supply unit (2) overall presenting a I-shaped structure, the power supply unit (2) comprising an upper part (35) and a lower part (36), the upper part (35) of the power supply unit (2) being located within the groove (34), the lower part (36) of the power supply unit (2) being located outside the groove (34) of the power supply rail (1);
- a wrapping part (37) being arranged on edge of the backside of the reflective bracket (31), the wrapping part (37) being fixed onto the lower part (36) of the power supply unit (2) through a bolt (38);
- the LED light bar (32) being connected to the reflective bracket (31);
- the lampshade (33) being connected to the front side of the reflective bracket (31) and covering the LED light bar (32); and
- the power supply unit (2) transmitting power to the LED light bar (32) after taking the power from the power supply rail (1).
2. The LED lamp with guide rail according to claim 1, wherein the power supply rail (1) comprises a top plate (39), two outer plates (310) and two inner plates (311); the top of the outer plate (310) and the inner plate (311) being fixed to the top plate (39), the bottom of inner plate (311) and the outer plate (310) being provided with a support plate (312); the top plate (39), the outer plate (310), the inner plate (311) and the support plate (312) surrounding together to form the semi-closed groove (34) and the groove (34) being used to accommodate the upper part (35) of the power supply unit (2).
  3. The LED lamp with guide rail according to claim 2, wherein the inner plate (311) is provided with a first slot (313); the first slot (313) being provided with an insulating slot strip (314), opening of the insulating slot strip (314) being facing toward the groove (34) and the insulating slot strip (314) being provided with a conductive wire (315) therein.
  4. The LED lamp with guide rail according to claim 3, wherein the cross-section of the insulating slot strip (314) presents a "Ω" shaped structure; the insulating slot strip (314) comprising a base (316), two first connecting portions (317) and two second connecting portions (318); one end of the two first connecting portions (317) being connected to two ends of the base (316) and the other end of the first connecting portions (317) being connected to the second connecting portions (318); a bayonet (319) being formed after connection of the first connecting portions (317) and the second connecting portions (318); the bayonet (319) being clamped on the inner plate (311) at both sides of the first slot (313); the first connecting portions (317) covering a side of the inner plate (311) and the second connecting portions (318) covers the other side of the inner plate (311).
  5. The LED lamp with guide rail according to claim 4, wherein the power supply unit (2) comprises a top cap (21), a housing (22) and a bottom cap (23); the interior of the housing (22) is provided with a space for accommodating a driving power supply; the top cap (21) covering on the housing (22) and the bottom cap (23) being arranged at the bottom of the housing (22); An outside wall of the housing (22) is provided with a fixing groove (24) and the fixed groove (24) cooperating with the support plate (312) to enable the power supply unit (2) to be fixed onto the power supply rail (1).
  6. The LED lamp with guide rail according to claim 5, wherein the housing (22) comprises a first portion (25) and a second portion (26); the fixing groove (24) is located at a junction between the first portion (25) and the second portion (26); the width of the second portion (26) is greater than the width of the first portion (25); a side of the second portion (26) being provided with a fixing hole (27) to be matched with the bolt (38).
  7. The LED lamp with guide rail according to claim 6, wherein the first portion (25) is provided with a first notch (28) on its two sides corresponding to a side wall of the power supply rail (1); the first notch (28) being provided with a first conductive sheet (29) with one end of the first conductive sheet (29) being connected to the conductive wire (315) and the other end of the first conductive sheet (29) being connected to the driving power supply; the first conductive sheet (29) presenting a "Z" shaped structure and comprising a mounting portion (210), an elastic portion (211) and a contact portion (212); the mounting portion (210) being used to mount the conductive sheet onto the housing (22); the elastic portion (211) being connected onto the mounting portion (210); the contact portion (212) being in contact with the conductive wire (315); the contact portion (212) being connected onto the elastic portion (211); the housing (22) is provided with a retaining wall (213) to be cooperated with the elastic portion (211), one side of the retaining wall (213) which is facing to the elastic portion (211) is a slope; the distance between one end of the elastic portion (211) which is near the mounting portion (210) and the retaining wall (213) being less than the distance between one end of the elastic portion (211) which is near the contact portion (212) and the retaining wall (213); and one end of the contact portion (212) which is in contact with conductive wire (315) being provided with an arcuate edge (214).
  8. The LED lamp with guide rail according to claim 7, wherein the bottom of the driving power supply is connected with a second conductive sheet (215); the

bottom cap (23) being provided with a second notch (216); one end of the second conductive sheet (215) which is away from the driving power supply cooperating with the second notch (216); a position of the second conductive sheet (215) which is near the second notch (216) presenting an arcuate fold (217); one end portion of the second conductive sheet (215) which is near the second notch (216) being provided with a conductive contact (218).

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9. The LED lamp with guide rail according to any one of claims 4-7, wherein the reflective bracket (31) further comprises a radiating back plate (320), two side plates (321) and an arcuate reflective plate (322); the two side plates (321), the radiating back plate (320) and arcuate reflective plate (322) surrounding together to form a hollow space; the radiating back plate (320) and the wrapping part (37) being an integrated structure; an inside surface of the arcuate reflective plate (322) being provided with a second slot (323) and the LED light bar (32) being stuck into the second slot (323); two sides of the arcuate reflective plate (322) being provided with a third slot (324) and two sides of the lampshade (33) being provided with a card edge (325); the card edge (325) being stuck in the third slot (324).

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10. The LED lamp with guide rail according to claim 8, wherein it further comprises an end cap (326) comprising a body (327) and a support plate (328); the support plate (328) being fixed to one side of the body (327), the support plate (328) being provided with a stopper (329); the stopper (329) being corresponding to the second conductive sheet (215) and the support plate (328) being further provided with a through hole (330).

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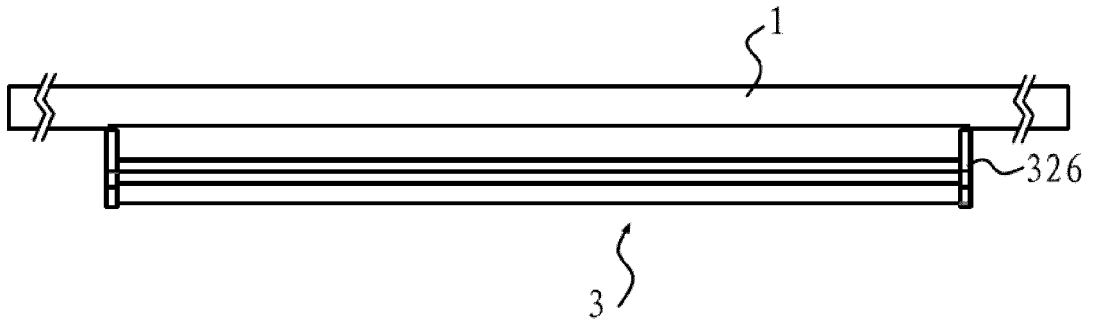


Fig. 1

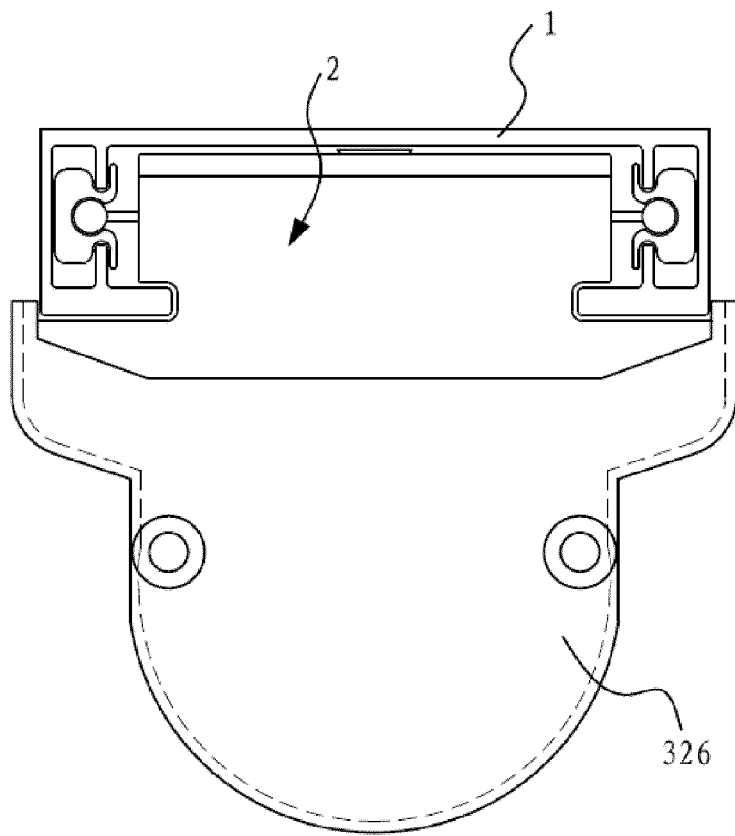


Fig. 2

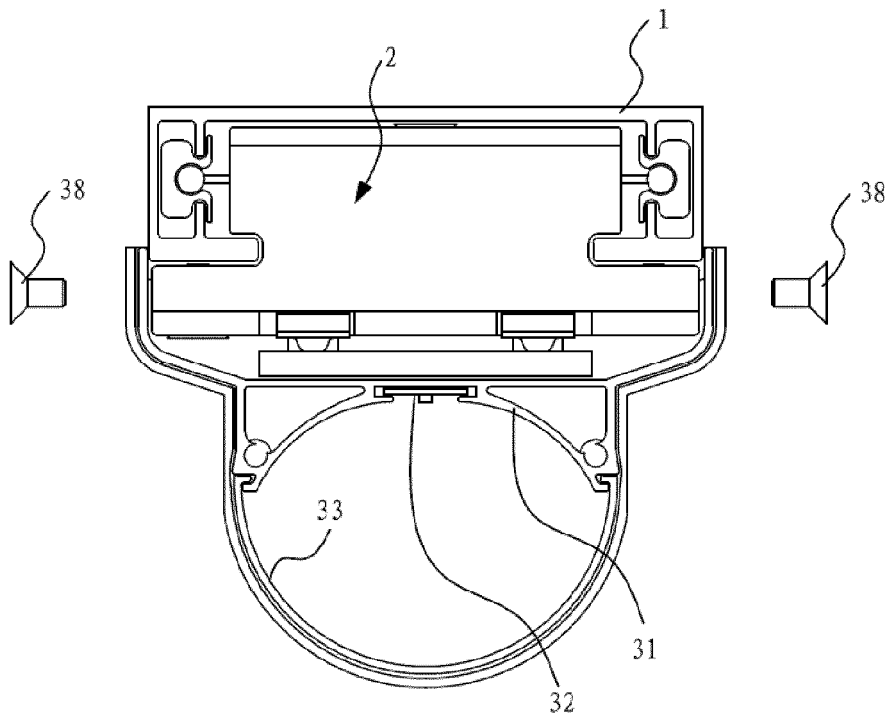


Fig. 3

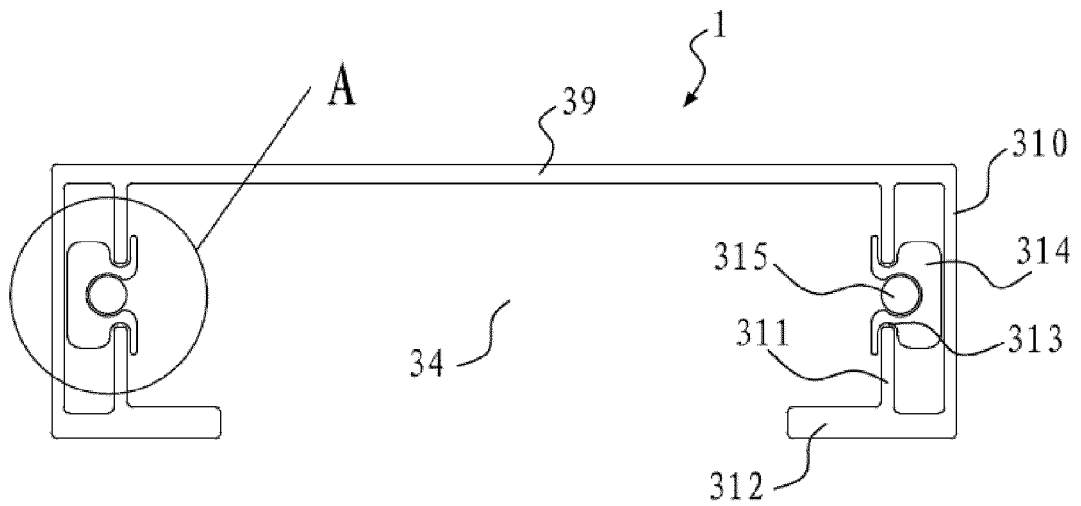
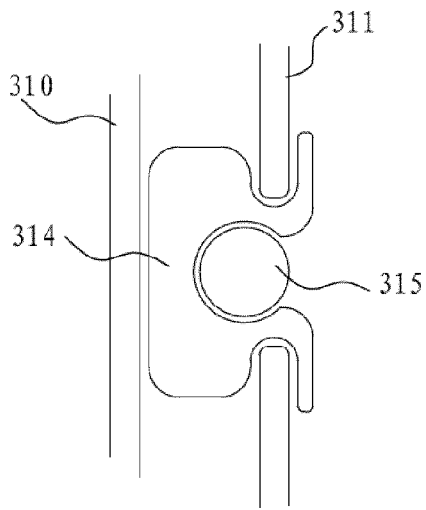
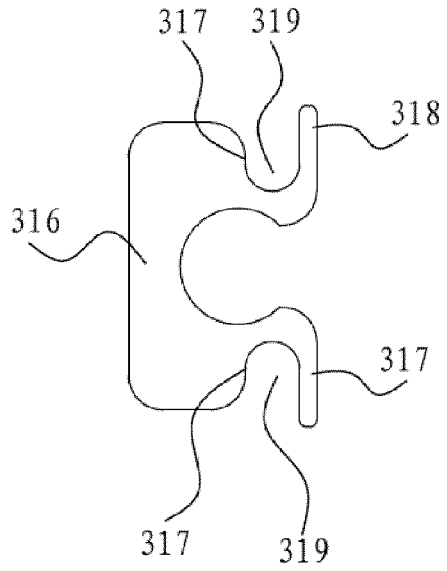


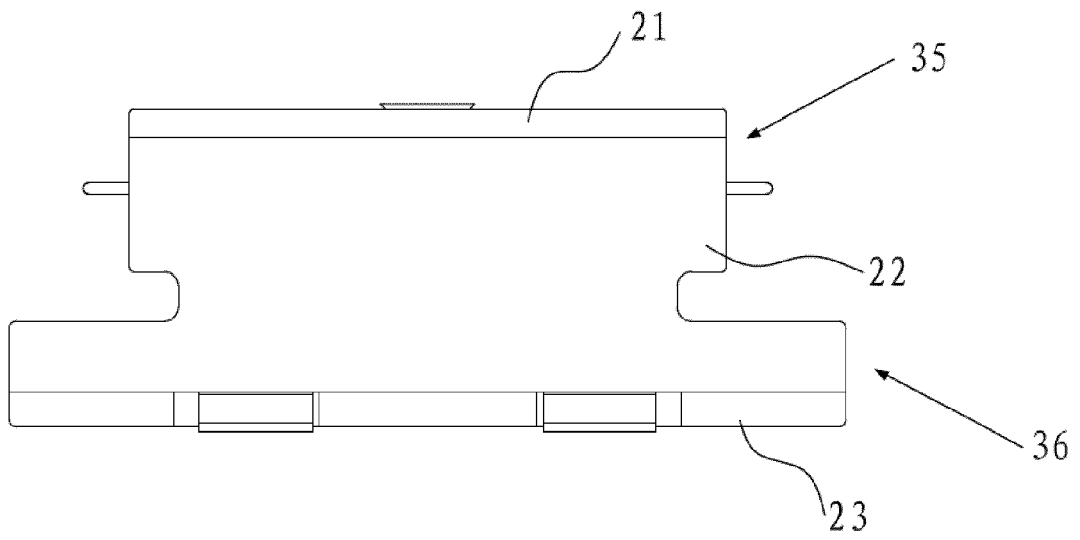
Fig. 4



**Fig. 5**



**Fig. 6**



**Fig. 7**

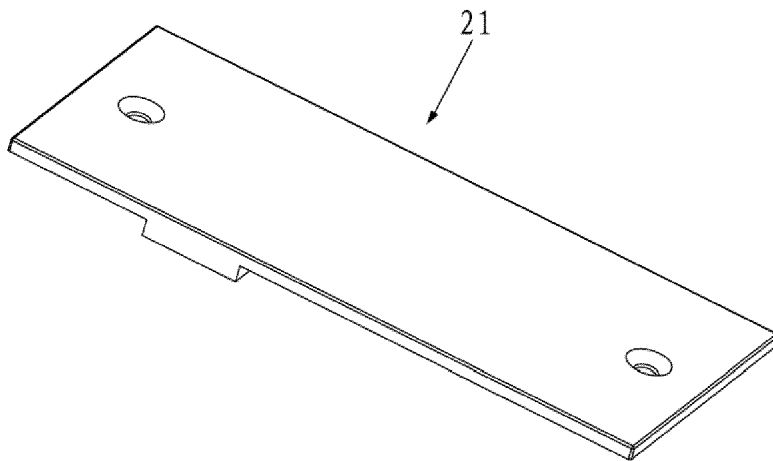


Fig. 8

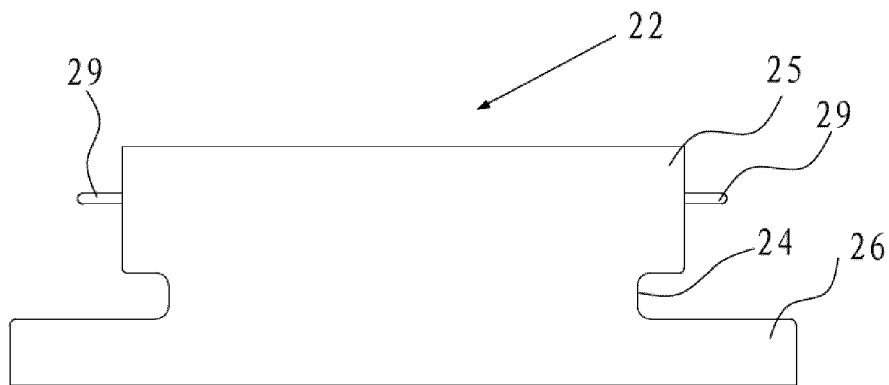


Fig. 9

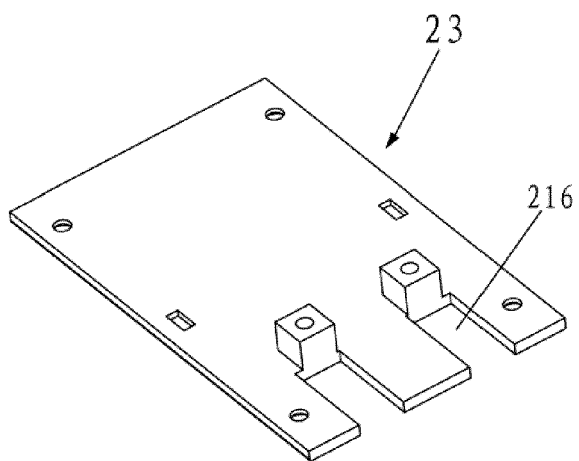


Fig. 10

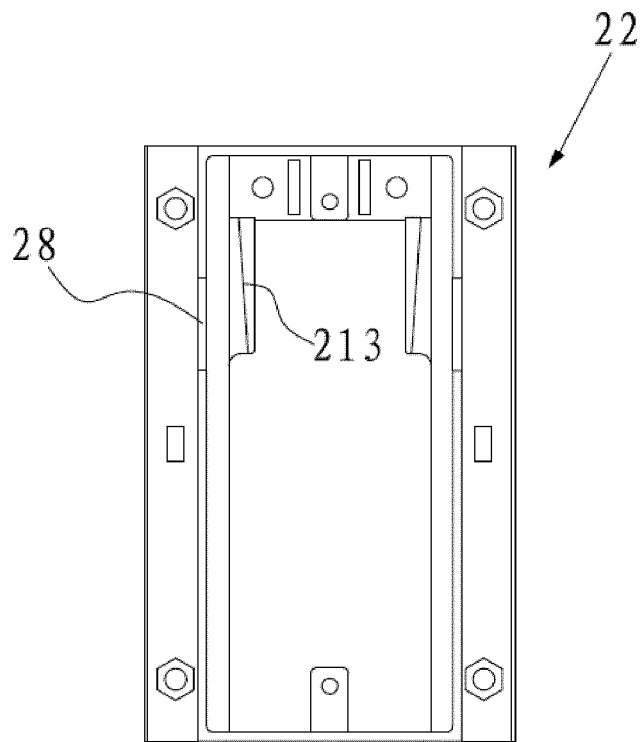


Fig. 11

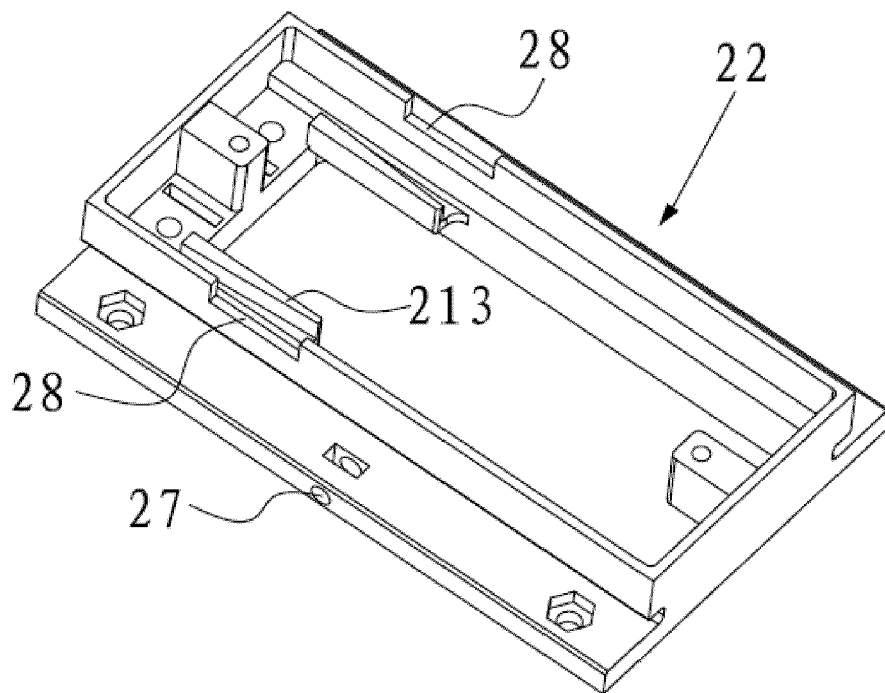
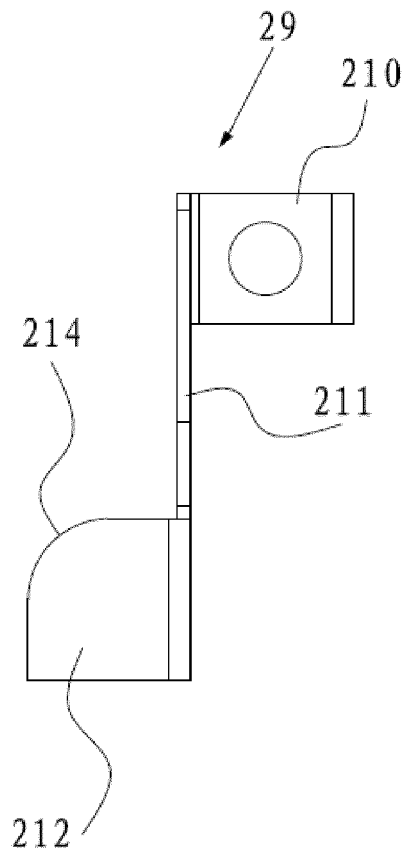
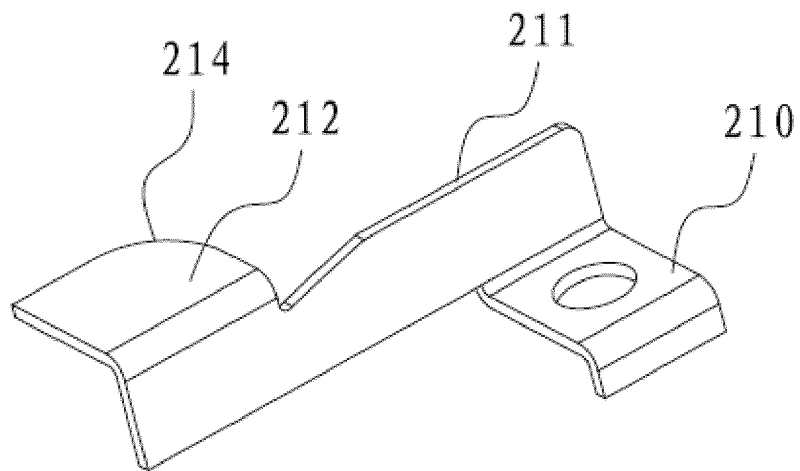


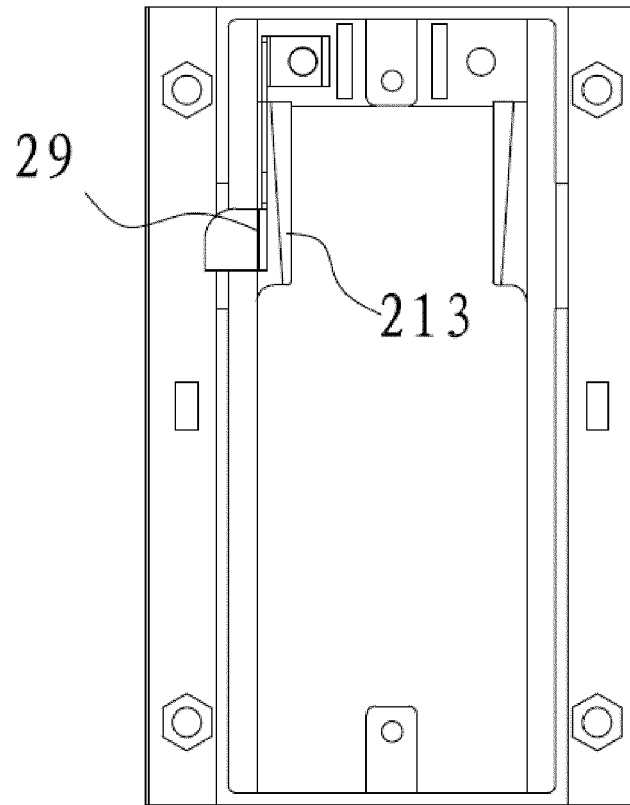
Fig. 12



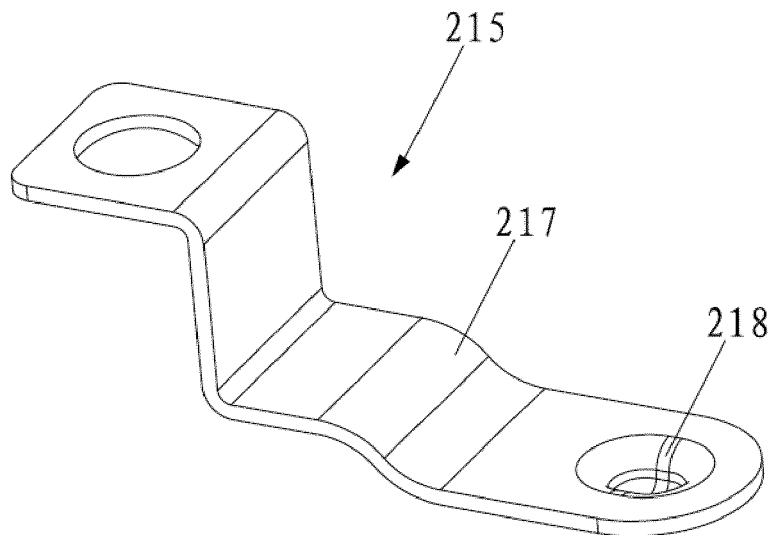
**Fig. 13**



**Fig. 14**



**Fig. 15**



**Fig. 16**

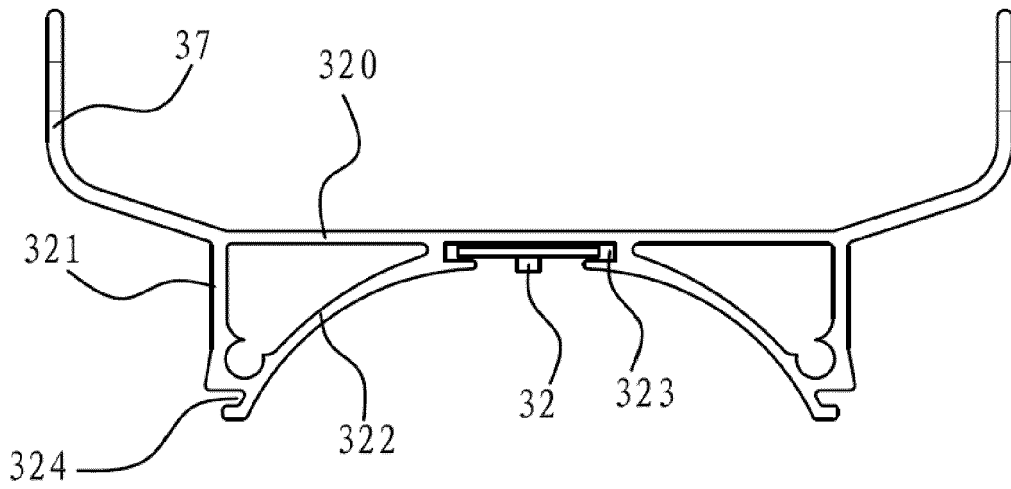


Fig. 17

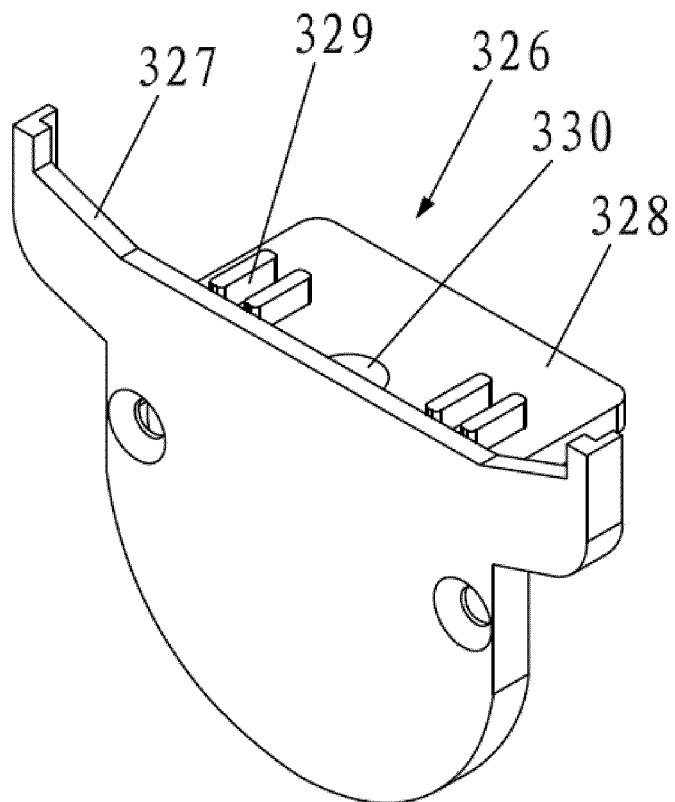
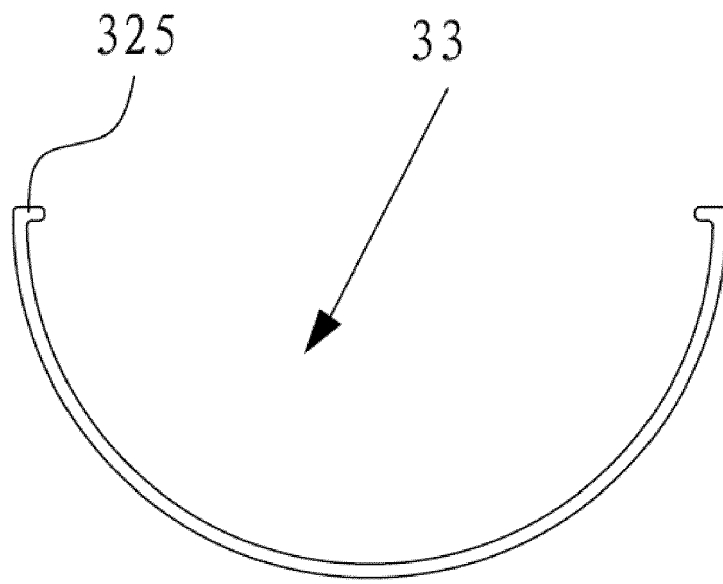


Fig. 18



**Fig. 19**



EUROPEAN SEARCH REPORT

Application Number  
EP 15 16 9573

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A	EP 2 672 177 A1 (KONINKL PHILIPS NV [NL]) 11 December 2013 (2013-12-11) * paragraph [0028] * * figure 3 * -----	1-10	ADD. F21V17/12 F21Y101/02 F21Y103/00
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			F21V F21Y F21S
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 26 November 2015	Examiner Demirel, Mehmet
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
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