(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
6 April 2017 (06.04.2017)

WIPO | PCT

(10) International Publication Number
WO 2017/054740 A1

(51) **International Patent Classification**:
B60R 11/02 (2006.01)

(21) **International Application Number**:
PCT/CN2016/100650

(22) **International Filing Date**:
28 September 2016 (28.09.2016)

(25) **Filing Language**: English

(26) **Publication Language**: English

(30) **Priority Data**:
201510631772.X
29 September 2015 (29.09.2015) CN

(71) **Applicant**: **BYD COMPANY LIMITED** [CN/CN]; No. 3009 BYD Road, Pingshan, Shenzhen, Guangdong 518118 (CN).

(72) **Inventors**: **DU, Zhengqiang**; No. 3009 BYD Road, Pingshan, Shenzhen, Guangdong 518118 (CN). **LI, Yingjiu**; No. 3009 BYD Road, Pingshan, Shenzhen, Guangdong 518118 (CN). **ZHANG, Xiaoru**; No. 3009 BYD Road, Pingshan, Shenzhen, Guangdong 518118 (CN). **DU, Juhua**; No. 3009 D Road, Pingshan, Shenzhen, Guangdong 518118 (CN).

(74) **Agent**: **TSINGYIHUA INTELLECTUAL PROPERTY LLC**; Room 301 Trade Building, Zhaolanyuan, Tsinghua University, Qinghuayuan 100084 (CN).

(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, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, 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, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE,

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(54) **Title**: FIXING SYSTEM FOR VEHICLE-MOUNTED ELECTRONIC DEVICE AND VEHICLE HAVING THE SAME

(57) **Abstract**: A fixing system for a vehicle-mounted electronic device and a vehicle having the same. The fixing system (100) includes a base (1); an electromagnetic positioning component (4) disposed on the base (1) and configured to attract the vehicle-mounted electronic device to the base (1); and an electric control device (3) configured to regulate an attraction force of the electromagnetic positioning component (4) by controlling an electric current of the electromagnetic positioning component (4) according to a running state of a vehicle.

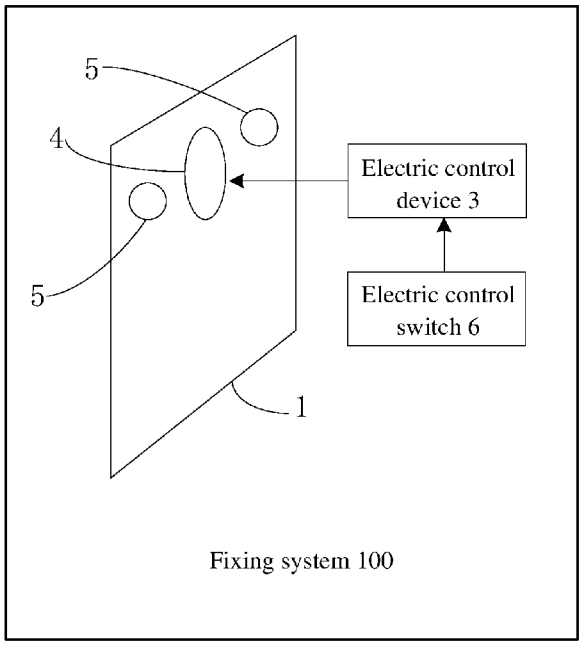

Fig. 6

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DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*

FIXING SYSTEM FOR VEHICLE-MOUNTED ELECTRONIC DEVICE AND VEHICLE HAVING THE SAME

TECHNICAL FIELD

The present invention relates generally to a field of vehicle, more particularly relates to a fixing system for a vehicle-mounted electronic device and a vehicle having the same.

BACKGROND

In the related art, an electronic device, such as a tablet computer, is disposed on a central control desk of some vehicles, and a screen size of the tablet computer is becoming larger and larger, even reaches more than 10 inches. However, since the vehicle may present vibrations of various degrees during the process of driving, it is difficult to ensure that the tablet computer is kept in a locked state, and even the tablet computer may be shaken to drop. In addition, when the screen size of the tablet computer is larger than 10 inches, it is more difficult to keep the tablet computer in the locked state during the course of driving, because a fitting surface between the tablet computer and a base of the central control desk is small, and an edge of the screen may be scratched easily when the tablet computer is locked on the base.

SUMMARY

The present invention aims to solve at least one of the technical problems existing in the prior art. Accordingly, the present invention provides a fixing system for a vehicle-mounted electronic device, which can regulate a locking degree of the vehicle-mounted electronic device according to a running state of the vehicle, thus ensuring the vehicle-mounted electronic device to be locked tightly and removed safely.

The present invention also provides a vehicle including the above fixing system for the vehicle-mounted electronic device.

According to a first aspect of embodiments of the present invention, the fixing system for the vehicle-mounted electronic device includes: a base; an electromagnetic positioning component disposed on the base and configured to attract the vehicle-mounted electronic device to the base; and an electric control device configured to regulate an attraction force of the electromagnetic positioning component by controlling an electric current of the electromagnetic

positioning component according to a running state of a vehicle.

With the fixing system for the vehicle-mounted electronic device according to embodiments of the present invention, the electromagnetic positioning component is disposed on the base, the electric control device can control the electric current of the electromagnetic positioning component according to the running state of the vehicle, such that the locking degree of the vehicle-mounted electronic device can be regulated, and the vehicle-mounted electronic device can be prevented from shaking, being loosened and even dropping off from the base due to the vibration of the vehicle, thus improving the connection stability between the vehicle-mounted electronic device and the base. Moreover, the vehicle-mounted electronic device can also be easily removed so as to fully meet requirements of users.

According to an embodiment of the present invention, the electric control device is configured to: control the electric current of the electromagnetic positioning component to attract the vehicle-mounted electronic device to the base, if a speed of the vehicle is equal to a first threshold, when the vehicle accelerates; and control the electric current of the electromagnetic positioning component to weaken or eliminate the attraction force to the vehicle-mounted electronic device, if the speed of the vehicle is equal to a second threshold, when the vehicle decelerates, in which the second threshold is smaller than the first threshold.

In addition, the electric control device is configured to control the electric current of the electromagnetic positioning component to attract the vehicle-mounted electronic device to the base, when the speed of the vehicle is reduced to zero and the vehicle is stalled.

According to an embodiment of the present invention, the fixing system for the vehicle-mounted electronic device further includes an electric control switch, in which the electric control switch is configured to output a trigger signal to the electric control device when triggered, the electric control device controls the electric current of the electromagnetic positioning component according to the trigger signal, so as to attract the vehicle-mounted electronic device to the base or to weaken or eliminate the attraction force to the vehicle-mounted electronic device.

In some embodiments of the present invention, the electromagnetic positioning component is an electro-permanent magnetic positioning component.

The electro-permanent magnetic positioning component includes an electro-permanent magnetic sucker, the electro-permanent magnetic sucker is configured to carry out a positive excitation under control of the electric control device to attract the vehicle-mounted electronic device to the base, or to carry out a negative excitation under control of the electric control device

to weaken or eliminate the attraction force to the vehicle-mounted electronic device.

According to an embodiment of the present invention, the fixing system for the vehicle-mounted electronic device further includes at least one magnetic positioning component disposed on the base.

The magnetic positioning component is used to position the vehicle-mounted electronic device and reduce an impact when the vehicle-mounted electronic device is attracted, so as to prevent the vehicle-mounted electronic device from being scratched. When the vehicle-mounted electronic device is unlocked by the electromagnetic positioning component, the magnetic positioning component is also used to prevent the vehicle-mounted electronic device from dropping off directly so as to ensure the safety and reliability of using the vehicle-mounted electronic device.

According to an embodiment of the present invention, each of the at least one magnetic positioning component includes a permanent magnet.

In some embodiments of the present invention, the vehicle-mounted electronic device is a tablet computer.

According to a second aspect of embodiments of the present invention, a vehicle is provided, including the fixing system for the vehicle-mounted electronic device according to above embodiments of the present invention.

With the vehicle according to embodiments of the present invention by providing the above fixing system for the vehicle-mounted electronic device, the locking degree of the vehicle-mounted electronic device can be regulated, and the vehicle-mounted electronic device can be prevented from shaking, being loosened and even dropping off from the base due to the vibration of the vehicle, thus improving the connection stability between the vehicle-mounted electronic device and the base. Moreover, the vehicle-mounted electronic device can also be easily removed so as to fully meet the requirements of users, bring about great convenience to the users and ensure the safety of driving.

Additional aspects and advantages of embodiments of present invention will be given in part in the following descriptions, become apparent in part from the following descriptions, or be learned from the practice of the embodiments of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings are provided to facilitate further understanding of the present invention, constitute a part of the specification, and are used to interpret the present invention

together with the following specific embodiments, but do not constitute a limitation to the present invention. In the accompanying drawings:

Fig. 1 is a perspective view showing a base of a fixing system for a vehicle-mounted electronic device according to an embodiment of the present invention;

Fig. 2 is a front view showing the base of the fixing system for the vehicle-mounted electronic device as shown in Fig. 1;

Fig. 3 is a top view showing the base of the fixing system for the vehicle-mounted electronic device as shown in Fig. 1;

Fig. 4 is a left view showing the base of the fixing system for the vehicle-mounted electronic device as shown in Fig. 1;

Fig. 5 is an enlarged view of part A in Fig. 4; and

Fig. 6 is a block diagram of a fixing system for a vehicle-mounted electronic device according to an embodiment of the present invention.

Reference numerals:

100 fixing system;

1 base, 11 permanent magnet, 12 electro-permanent magnetic sucker, 13 arc positioning sheet;

3 electric control device, 4 electromagnetic positioning component, 5 magnetic positioning component, 6 electric control switch.

DETAILED DESCRIPTION

Reference will be made in detail to embodiments of the present invention. The embodiments described herein with reference to drawings are explanatory, illustrative, and used to generally understand the present invention. The embodiments shall not be construed to limit the present invention. The same or similar elements and the elements having same or similar functions are denoted by like reference numerals throughout the descriptions.

In the specification, unless specified or limited otherwise, relative terms such as “central”, “longitudinal”, “lateral”, “front”, “rear”, “right”, “left”, “inner”, “outer”, “lower”, “upper”, “horizontal”, “vertical”, “above”, “below”, “up”, “top”, “bottom” as well as derivative thereof (e.g., “horizontally”, “downwardly”, “upwardly”, etc.) should be construed to refer to the orientation as then described or as shown in the drawings under discussion. These relative terms are for convenience of description and do not require that the present invention be constructed or operated in a particular orientation.

In addition, terms such as “first” and “second” are used herein for purposes of description and are not intended to indicate or imply relative importance or significance. Thus, the feature defined with “first” and “second” may comprise one or more this feature. In the description of the present invention, “a plurality of” means two or more than two, unless specified otherwise.

In the description of the present invention, it should be understood that, unless specified or limited otherwise, the terms “mounted”, “connected” and “coupled” and variations thereof are used broadly and encompass such as mechanical or electrical mountings, connections and couplings, also can be inner mountings, connections and couplings of two components, and further can be direct and indirect mountings, connections, and couplings, which can be understood by those skilled in the art according to the detail embodiment of the present invention.

With reference to Fig. 1-Fig. 6, a fixing system 100 for a vehicle-mounted electronic device according to a first aspect of embodiments of the present invention is described in the following. The fixing system 100 for the vehicle-mounted electronic device may be applied to a center console of a vehicle, so that it is convenient for users to use the vehicle-mounted electronic device. The vehicle-mounted electronic device may be a tablet computer.

As shown in Fig. 1-Fig. 6, the fixing system 100 for the vehicle-mounted electronic device includes a base 1, an electric control device 3 and an electromagnetic positioning component 4.

The electromagnetic positioning component 4 is disposed on the base 1, and the electromagnetic positioning component 4 is used to attract the vehicle-mounted electronic device (e.g. the tablet computer) to the base 1, so that a connection stability between the vehicle-mounted electronic device (e.g. the tablet computer) and the base 1 can be improved. The electric control device 3 is used to control an electric current of the electromagnetic positioning component 4 according to a running state of the vehicle, so as to regulate an attraction force of the electromagnetic positioning component 4, such that it is possible to regulate a locking degree of the vehicle-mounted electronic device, and thus it is convenient to fasten or remove the vehicle-mounted electronic device, e.g. the tablet computer.

It should be noted that, in the embodiments of the present invention, when the vehicle-mounted electronic device (e.g. the tablet computer) has a metal shell or a metal rear cover, a magnetic force may be produced between the electromagnetic positioning component 4 and the vehicle-mounted electronic device, so that the vehicle-mounted electronic device can be attracted to the base 1 by the electromagnetic positioning component 4. When the shell of the vehicle-mounted electronic device is not made of metal materials, the vehicle-mounted electronic device (e.g. the tablet computer) may be fixed on a metal plate or a metal plate may be arranged

in the shell of the tablet computer firstly, and then a magnetic force can be produced between the electromagnetic positioning component 4 and the vehicle-mounted electronic device, e.g. the tablet computer, so that the vehicle-mounted electronic device can be attracted to the base by the electromagnetic positioning component 4.

Further, as shown in Fig. 6, according to an embodiment of the present invention, the fixing system 100 for the vehicle-mounted electronic device also includes at least one magnetic positioning component 5. The at least one magnetic positioning component 5 is disposed on the base 1 and used to ensure that a certain attraction force always exists between the vehicle-mounted electronic device (e.g. the tablet computer) and the base 1. Thus, even if a magnetic force of the electromagnetic positioning component 4 disappears, the vehicle-mounted electronic device will not slip off.

It can be understood that the present invention does not have a special limitation to amounts of the magnetic positioning components 5 and the electromagnetic positioning components 4, as long as the vehicle-mounted electronic device (such as the tablet computer) can be reliably attracted to the base 1. As shown in Fig. 1 to Fig. 5, the tablet computer may be attracted to the base 1 by two magnetic positioning components 5 and one electromagnetic positioning component 4. Of course, the tablet computer may also be attracted to the base 1 by multiple magnetic positioning components 5 and multiple electromagnetic positioning components 4, so that the tablet computer can be more firmly connected to the base 1.

When the vehicle-mounted electronic device is configured as the tablet computer, an upper part of the tablet computer is closed towards the base 1 after a bottom of the tablet computer is inserted into the base 1, and then the magnetic force generated by the magnetic positioning component 5 can attract the tablet computer to the base 1, so as to position the tablet computer and relax an impact on the tablet computer when the tablet computer is attracted, thus avoiding scratching the tablet computer.

In an embodiment of the present invention, the electric control device 3 is used to control the electric current of the electromagnetic positioning component 4 according to the running state of the vehicle. When the vehicle accelerates, if the speed of the vehicle is increased to a first threshold, such as 10km/h, the electric control device 3 controls the electric current of the electromagnetic positioning component 4 so as to attract the vehicle-mounted electronic device to the base 1. When the vehicle decelerates, if the speed of the vehicle is reduced to a second threshold, such as 0 km/h, the electric control device 3 controls the electric current of the electromagnetic positioning component 4 so as to weaken or eliminate the attraction force to the

vehicle-mounted electronic device, i.e. loosen the vehicle-mounted electronic device from the base 1, so that it is convenient for users to remove the tablet computer. The second threshold is smaller than the first threshold.

In addition, when the speed of the vehicle is reduced to zero and the vehicle is stalled, the electric control device 3 controls the electric current of the electromagnetic positioning component 4 so as to attract the vehicle-mounted electronic device (such as the tablet computer) to the base 1, so that after a driver leaves the vehicle which has been stalled, the tablet computer can be prevented from being removed by someone else, thus improving the security.

In other words, when the vehicle is driving at a high speed, the tablet computer needs to be locked tightly so as to make sure that the tablet computer cannot shake or slip off due to the vibration of the vehicle. At this time, the electric control device 3 controls the electric current of the electromagnetic positioning component 4 to strengthen the magnetic force of the electromagnetic positioning component 4, so that the tablet computer can be firmly attracted to the base 1. When the vehicle is stalled, the vehicle will not vibrate, and users may need to take the tablet computer down, so the tablet computer needs to be unlocked. At this time, the electric control device 3 controls the electric current of the electromagnetic positioning component 4 to weaken or eliminate the magnetic force of the electromagnetic positioning component 4, and thus the attraction force between the tablet computer and the base 1 is reduced, so that the attraction force to the vehicle-mounted electronic device can be weakened or eliminated, i.e., the tablet computer can be loosened from the base 1. In this case, the tablet computer can be easily removed from the base 1 when the users turn the tablet computer in a direction running away from the base 1.

Because of the magnetic force generated by the magnetic positioning component 5, when the magnetic force of the electromagnetic positioning component 4 is eliminated, the tablet computer still can be attracted to the base 1, so that the tablet computer can be prevented from dropping off directly, thus ensuring a safety of using the tablet computer.

With the fixing system 100 for the vehicle-mounted electronic device according to embodiments of the present invention, the tablet computer can be disposed on the base 1 by the magnetic positioning component 5 and the electromagnetic positioning component 4, and the electric control device 3 can control the electric current of the electromagnetic positioning component 4 to regulate the attraction force thereof, so that the locking degree of the tablet computer can be regulated. Therefore, no matter the vehicle is stalled or drives, the tablet computer can be firmly attracted to the base 1 if the tablet computer needs to be locked, such that

the tablet computer can be prevented from shaking, being loosened and even dropping off from the base 1 due to the vibration of the vehicle, and thus the connection stability between the vehicle-mounted electronic device and the base 1 is improved. If the tablet computer needs to be unlocked, the magnetic force of the electromagnetic positioning component 4 is weakened or eliminated, so that the tablet computer can be taken down easily. In addition, the magnetic positioning component 5 can position the tablet computer and relax an impact on the tablet computer when the tablet computer is attracted, so as to avoid scratching the tablet computer. The magnetic positioning component 5 can also prevent the tablet computer from dropping off when the magnetic force of the electromagnetic positioning component 4 disappears.

As shown in Fig. 1 to Fig. 5, according to an embodiment of the present invention, each magnetic positioning component 5 includes a permanent magnet 11. The permanent magnet 11 may be disposed on a side of the base 1 adjacent to the tablet computer, so that it is convenient to position and mount the tablet computer. For example, the permanent magnet 11 may be arranged on a front surface of the base 1. A connection manner of the permanent magnet 11 and the base 1 is not specially limited herein. For example, the permanent magnet 11 may be integrally molded with the base 1, to reduce assembling steps of the base 1 and improve the production efficiency. For another instance, the permanent magnet 11 may also be detachably arranged on the base 1, so that it is convenient to replace the permanent magnet 11.

It can be understood that as long as the tablet computer can be attracted to the base 1 by the permanent magnet 11, the present invention does not make a special limitation to a specific shape of the permanent magnet 11. For example, the permanent magnet 11 may have a circular shape as shown in Figs. 1- 5.

Optionally, a plurality of magnetic positioning components 5 may be provided and arranged in the same line, so that the attraction force between the tablet computer and the base 1 can be enhanced, and the tablet computer is stressed uniformly. Thus, the tablet computer can be positioned on the base 1 stably and reliably. Each of the plurality of magnetic positioning components 5 includes the permanent magnet 11. For example, as shown in Fig. 1 to Fig. 5, two magnetic positioning components 5 are provided, and two permanent magnets 11 of the two magnetic positioning components 5 are located on left and right sides of the electromagnetic positioning component 4 respectively, and are positioned in a same straight line in a left and right direction with the electromagnetic positioning component 4, such that the tablet computer can be attracted to the base 1 steadily.

It can be understood that as long as the tablet computer can be positioned and attracted to the

base 1, an arrangement manner of the plurality of magnetic positioning components 5 is not limited to this. For example, the permanent magnets 11 of the plurality of magnetic positioning components 5 may be arranged and spaced apart from one another in an upper and lower direction (i.e., an upper and lower direction shown in Fig. 1 to Fig. 5), or the permanent magnets 11 of the plurality of magnetic positioning components 5 may also be arranged and spaced apart from one another along a circumferential direction.

According to some embodiments of the present invention, the electromagnetic positioning component 4 may be an electro-permanent magnetic positioning component, so that the electromagnetic positioning component only needs to be energized when being magnetized, and the electromagnetic positioning component can still have a magnetic force after being deenergized.

As shown in Fig. 1 to Fig. 5, the electro-permanent magnetic positioning component includes an electro-permanent magnetic sucker 12 which may be disposed on the base 1. The electro-permanent magnetic sucker 12 may carry out a positive excitation under control of electric control device 3, so as to attract the vehicle-mounted electronic device (such as the tablet computer) to the base 1. The electro-permanent magnetic sucker 12 may also carry out a negative excitation under control of electric control device 3, so as to weaken or eliminate the attraction force to the vehicle-mounted electronic device, i.e. loosen the vehicle-mounted electronic device (such as the tablet computer) from the base 1. In other words, the electric control device 3 controls a current direction of the electro-permanent magnetic sucker 12 so as to perform the positive excitation on the electro-permanent magnetic sucker 12, i.e., the electro-permanent magnetic sucker 12 is magnetized, and thus the magnetic force of the electro-permanent magnetic sucker 12 is enhanced; the electric control device 3 controls the current direction of the electro-permanent magnetic sucker 12 so as to perform the negative excitation on the electro-permanent magnetic sucker 12, i.e., the electro-permanent magnetic sucker 12 is demagnetized, and thus the magnetic force of the electro-permanent magnetic sucker 12 is weakened and even eliminated.

In other words, the magnetic force of the permanent magnet sucker 12 is enhanced when the permanent magnet sucker 12 is energized and is given the positive excitation, such as a positive current, so that the attraction force between the tablet computer and the base 1 is enhanced, and the tablet computer can be firmly attracted to the base 1. At this time, the tablet computer is in a locked state, such that the tablet computer not only can be prevented from shaking and even dropping off from the base 1, but also can be protected from being stolen. The magnetic force of

the electro-permanent magnetic sucker 12 is weakened when the permanent magnet sucker 12 is energized and is given the negative excitation, such as a negative current, so that the attraction force between the tablet computer and the base 1 is reduced. At this time, the tablet computer is in an unlocked state, such that the tablet computer can be removed conveniently from the base 1.

In conclusion, with the fixing system for the vehicle-mounted electronic device according to the embodiment of the present invention, the electric control device controls the electromagnetic positioning component to lock by magnetizing and unlock by demagnetizing so as to regulate the locking degree of the vehicle-mounted electronic device (such as the tablet computer), such that the tablet computer and the base can be closely fitted with each other, thus solving a problem that the tablet computer may be loosened due to its own structural gap and may shake, even drop off due to the high frequency vibration in the vehicle driving process.

When the vehicle accelerates, for example the vehicle has just started and the speed of the vehicle is increasing, if the speed of the vehicle increases to the first threshold, such as 10km/h, the electric control device 3 controls the electro-permanent magnetic sucker 12 to be energized and to carry out the positive excitation, so as to enhance the magnetic force between the tablet computer and the base. When the vehicle decelerates, for example the speed of the vehicle is decreasing, the electric control device 3 may not carry out any action, however, if the speed of the vehicle drops to the second threshold, such as 0 km/h, the electric control device 3 controls the electro-permanent magnetic sucker 12 to be energized and to carry out the negative excitation, so as to weaken the magnetic force between the tablet computer and the base.

In other words, when the tablet computer is inserted into the base and is closed to the base, the back of the tablet computer is closely fitted to the base because of the attraction of the permanent magnet. When the vehicle starts and the speed of the vehicle increases, if a speed sensor monitors that the speed of the vehicle is greater than 10km/h, the speed sensor transmits a signal to the electric control device, and the electric control device controls the electric current of the electro-permanent magnetic sucker so as to perform the positive excitation on the electro-permanent magnetic sucker, so that the attraction force is enhanced, and the tablet computer can be locked completely. When the speed of the vehicle decreases and even becomes lower than 10km/h, the electric control device does not carry out any action, so as to prevent the tablet computer from dropping off due to a sharp speed decrease or the vehicle's bumping at a low speed.

In addition, when the vehicle slows down and the speed of the vehicle drops to the second threshold, for example 0 km/h, the electric control device controls the electro-permanent

magnetic sucker 12 to carry out the negative excitation, so that the attraction force is weakened and the tablet computer is unlocked, and thus it is convenient for users to remove the tablet computer.

Therefore, the electric control device can control the electric current of the electromagnetic positioning component according to the running state of the vehicle so as to regulate the attraction force of the electromagnetic positioning component, and thus the locking degree of the tablet computer can be regulated.

According to an embodiment of the present invention, as shown in Fig. 6, the fixing system 100 for the vehicle-mounted electronic device further includes an electric control switch 6. The electric control switch 6 outputs a trigger signal to the electric control device 3 when triggered, and the electric control device 3 controls the electric current of the electromagnetic positioning component according to the trigger signal, so as to attract the vehicle-mounted electronic device to the base 1 or to weaken or eliminate the attraction force to the vehicle-mounted electronic device. That is, the electric control device 3 controls the electro-permanent magnetic sucker 12 according to the trigger signal so as to perform the positive or negative excitation on the electro-permanent magnetic sucker 12.

Specifically, when the vehicle runs on a bumpy mountain road at a low speed, the fixing system cannot determine whether the tablet computer needs to be locked or not, and at this time, the driver can manually operate the electric control switch 6 to make the electric control device 3 perform the positive excitation on the electro-permanent magnetic sucker 12, so as to increase the attraction force and lock the tablet computer. Or, in the running process of the vehicle, if the tablet computer needs to be taken down, the driver can manually operate the electric control switch 6 to make the electric control device 3 perform the negative excitation on the electro-permanent magnetic sucker 12, so as to weaken or even eliminate the attraction force of the electro-permanent magnetic sucker 12, and thus only the attraction force generated by the permanent magnet 11 of the magnetic positioning component 5 is left. In this case, the tablet computer can be removed easily by pulling the upper part of the tablet computer directly.

Moreover, when the vehicle is stalled, for example a key of the vehicle is pulled out and the driver leaves the vehicle, the electric control device 3 controls the electro-permanent magnetic sucker 12 to carry out the positive excitation so as to increase the attraction force and lock the tablet computer. At this time, a triggering to the electric control switch 6 is invalid, such that a person in the vehicle can be prevented from taking down the tablet computer, and also, the tablet computer can be prevented from being stolen when nobody is in the vehicle, thus improving the

security.

With the fixing system 100 for the vehicle-mounted electronic device according to embodiments of the present invention, the electromagnetic positioning component is disposed on the base, and the electric control device can control the electric current of the electromagnetic positioning component according to the running state of the vehicle so as to regulate the attraction force of the electromagnetic positioning component, and thus the locking degree of the vehicle-mounted electronic device can be regulated. In the driving process of the vehicle, when the vehicle accelerates and the speed of the vehicle increases to the first threshold, the vehicle-mounted electronic device can be firmly attracted to the base, and also be prevented from shaking, being loosened and even dropping off from the base due to the vibration of the vehicle, thus improving the connection stability between the vehicle-mounted electronic device and the base. When the vehicle decelerates and the speed of the vehicle drops to the second threshold, the vehicle-mounted electronic device can be taken down conveniently by weakening or eliminating the attraction force of the electromagnetic positioning components, so as to fully meet requirements of the users.

According to an embodiment of the present invention, as shown in Fig. 1 to Fig. 4, the fixing system 100 for the vehicle-mounted electronic device further includes at least one arc positioning sheet 13. The arc positioning sheet 13 may be disposed at a bottom of the base 1 to support a lower end of the tablet computer. When the tablet computer is closed towards the base 1 or is taken down from the base 1, a smooth transition connection can be formed between the lower end of the tablet computer and the arc positioning sheet 13, so that the tablet computer can be smoothly attracted to the base 1 or taken down from the base 1, and thus the wear of the tablet computer can be reduced. For example, as shown in Fig. 1 to Fig. 3, two arc positioning sheets 13 are respectively arranged at left and right sides of the bottom of the base 1, so that an impact force can be reduced when the tablet computer is attracted to the base 1, thus facilitating mounting the tablet computer smoothly and taking down the tablet computer conveniently.

In addition, embodiments of the present invention further provide a vehicle including the fixing system 100 for the vehicle-mounted electronic device according to above embodiments of the present invention.

With the vehicle according to embodiments of the present invention, the above fixing system for the vehicle-mounted electronic device is provided to regulate the locking degree of the vehicle-mounted electronic device. Thus, in the driving process of the vehicle, when the vehicle accelerates and the speed of the vehicle increases to the first threshold, the vehicle-mounted

electronic device can be firmly attracted to the base, and also be prevented from shaking, being loosened and even dropping off from the base due to the vibration of the vehicle, thus improving the connection stability between the vehicle-mounted electronic device and the base. When the vehicle decelerates and the speed of the vehicle drops to the second threshold, the vehicle-mounted electronic device can be taken down conveniently by weakening or eliminating the attraction force of the electromagnetic positioning components, so as to fully meet requirements of the users, bring about great convenience to the users and ensure the driving safety.

Reference throughout this specification to “an embodiment”, “some embodiments”, “one embodiment”, “another example”, “an example”, “a specific examples” or “some examples” means that a particular feature, structure, material, or characteristic described in connection with the embodiment or example is included in at least one embodiment or example of the present invention. Thus, the appearances of the phrases such as “in some embodiments”, “in one embodiment”, “in an embodiment”, “in another example”, “in an example”, “in a specific examples” or “in some examples” in various places throughout this specification are not necessarily referring to the same embodiment or example of the present invention. Furthermore, the particular features, structures, materials, or characteristics may be combined in any suitable manner in one or more embodiments or examples.

Although explanatory embodiments have been shown and described, it would be appreciated by those skilled in the art that the above embodiments cannot be construed to limit the present invention, and changes, alternatives, and modifications can be made in the embodiments without departing from spirit, principles and scope of the present invention.

CLAIMS

What is claimed is:

1. A fixing system for a vehicle-mounted electronic device, comprising:

a base;

an electromagnetic positioning component disposed on the base and configured to attract the vehicle-mounted electronic device to the base; and

an electric control device configured to regulate an attraction force of the electromagnetic positioning component by controlling an electric current of the electromagnetic positioning component according to a running state of a vehicle.

2. The fixing system according to claim 1, wherein the electric control device is configured to:

control the electric current of the electromagnetic positioning component to attract the vehicle-mounted electronic device to the base, if a speed of the vehicle is equal to a first threshold, when the vehicle accelerates; and

control the electric current of the electromagnetic positioning component to weaken or eliminate the attraction force to the vehicle-mounted electronic device, if the speed of the vehicle is equal to a second threshold, when the vehicle decelerates,

wherein the second threshold is smaller than the first threshold.

3. The fixing system according to claim 2, wherein the electric control device is configured to control the electric current of the electromagnetic positioning component to attract the vehicle-mounted electronic device to the base, when the speed of the vehicle is reduced to zero and the vehicle is stalled.

4. The fixing system according to claim 1, further comprising an electric control switch, wherein the electric control switch is configured to output a trigger signal to the electric control device when triggered, and the electric control device controls the electric current of the electromagnetic positioning component according to the trigger signal, so as to attract the vehicle-mounted electronic device to the base or to weaken or eliminate the attraction force to the vehicle-mounted electronic device.

5. The fixing system according to any one of claims 1 to 4, wherein the electromagnetic positioning component is an electro-permanent magnetic positioning component.

6. The fixing system according to claim 5, wherein the electro-permanent magnetic positioning component comprises an electro-permanent magnetic sucker, and the

electro-permanent magnetic sucker is configured to carry out a positive excitation under control of the electric control device to attract the vehicle-mounted electronic device to the base, or to carry out a negative excitation under control of the electric control device to weaken or eliminate the attraction force to the vehicle-mounted electronic device.

7. The fixing system according to claim 1, further comprising at least one magnetic positioning component disposed on the base.

8. The fixing system according to claim 7, wherein each of the at least one magnetic positioning component comprises a permanent magnet.

9. The fixing system according to any one of claims 1-8, wherein the vehicle-mounted electronic device is a tablet computer.

10. A vehicle, comprising a fixing system for a vehicle-mounted electronic device according to any one of claims 1-9.

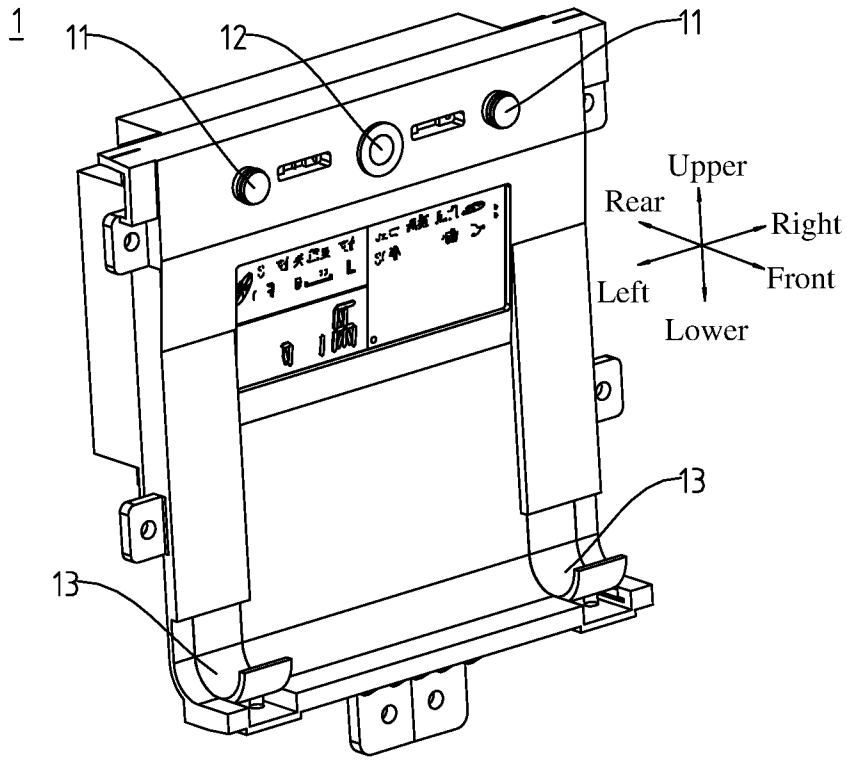
1
11
12
11
Upper
Rear
Right
Front
Left
Lower
13
13

Fig. 1

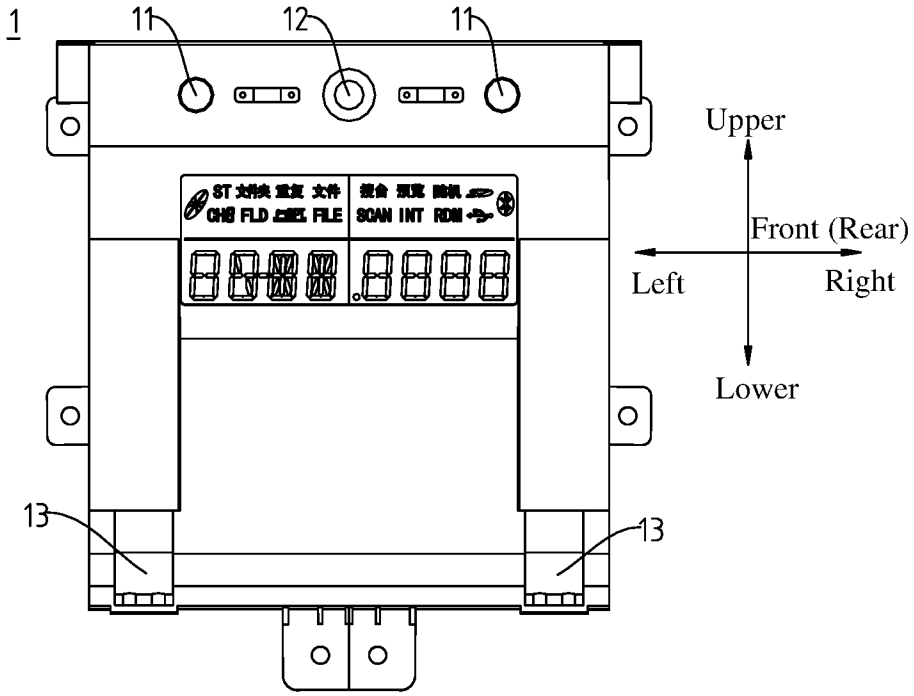
1
11
12
11
Upper
Front (Rear)
Left
Right
Lower
13
13

Fig. 2

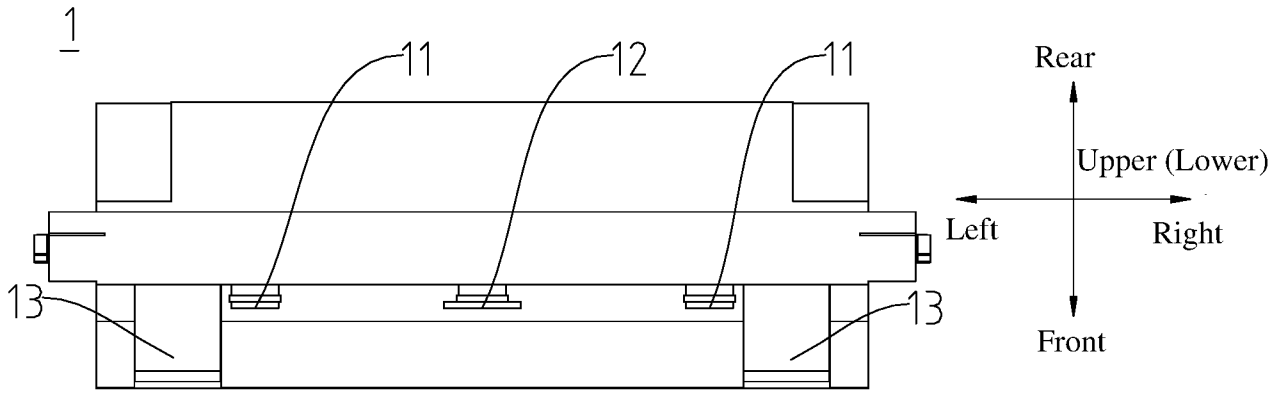
1
11
12
11
13
13
Rear
Upper (Lower)
Left
Right
Front

Fig. 3

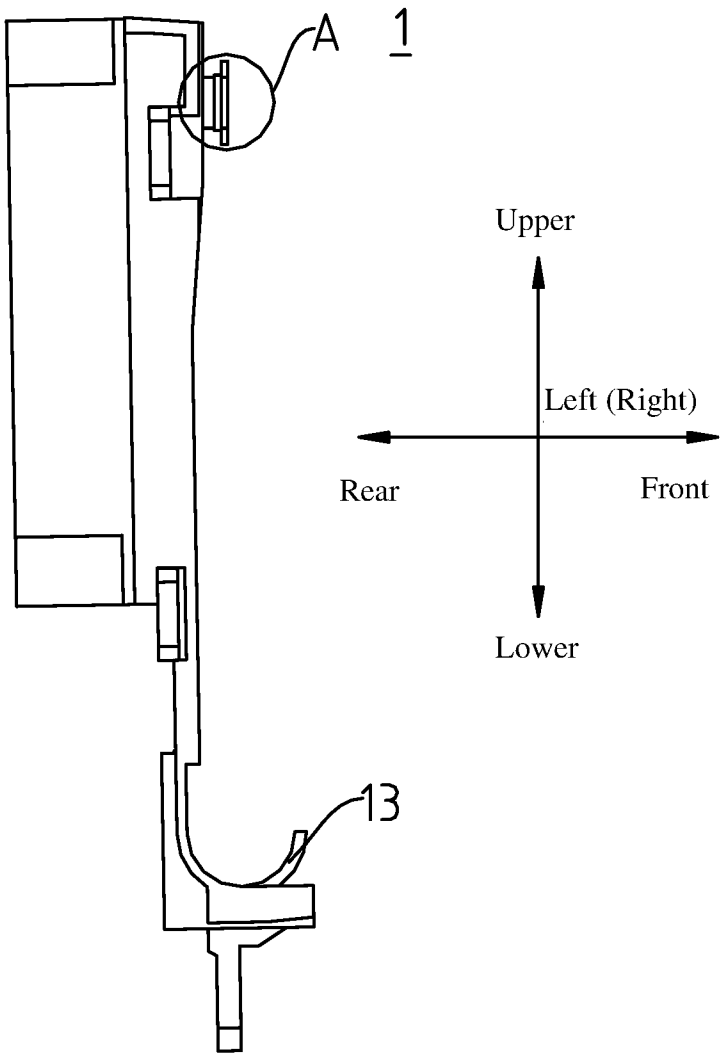
A
1
Upper
Left (Right)
Rear
Front
Lower
13

Fig. 4

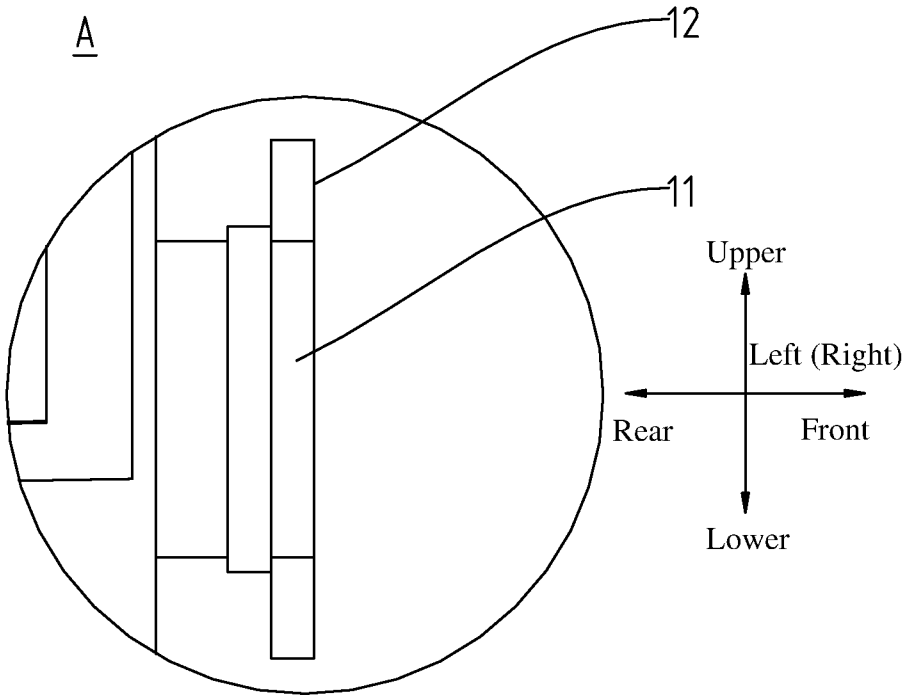
A
12
11
Upper
Left (Right)
Rear
Front
Lower

Fig. 5

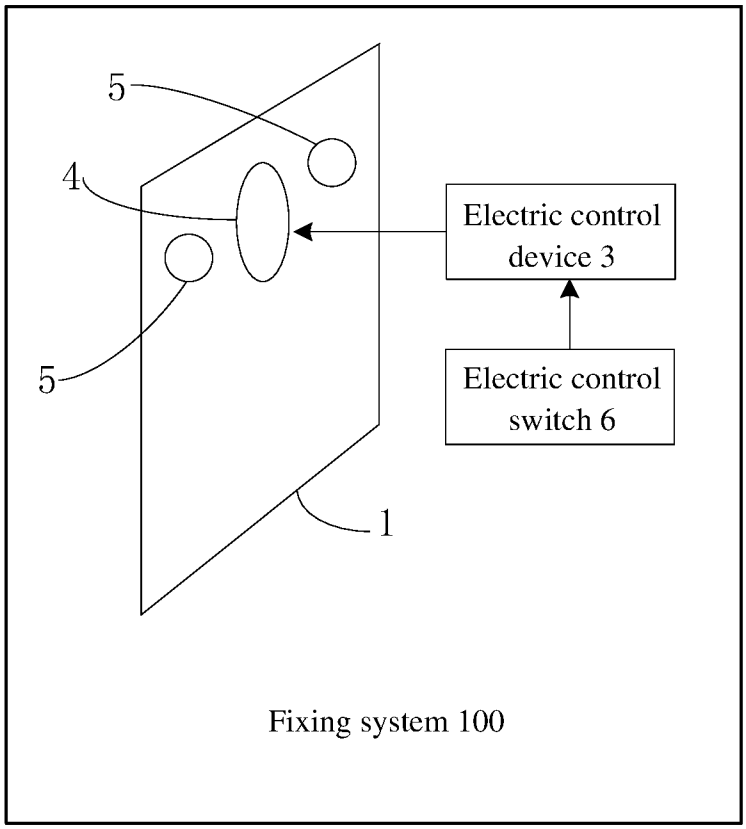
5
4
5
Electric control device 3
Electric control switch 6
1
Fixing system 100

Fig. 6

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2016/100650

A. CLASSIFICATION OF SUBJECT MATTER

B60R 11/02(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)

B60R

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

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

CNABS;SIPOABS;VEN: fix, mount, electr+, magnetic+, position, base, attract, force, increas+, eliminat+, weaken+, adjust, vehicle, control+, velocity

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2009256665 A1 (MITAC INT CORP) 15 October 2009 (2009-10-15) description, paragraphs [0017]-[0028] and figures 1-3	1-10
A	US 3860300 A (CAMBRIDGE THERMIONIC CORP) 14 January 1975 (1975-01-14) the whole document	1-10
A	CN 202992581 U (YANG SHUWEI) 12 June 2013 (2013-06-12) the whole document	1-10
A	DE 102007040159 A1 (DAIMLER AG) 26 February 2009 (2009-02-26) the whole document	1-10
A	JP 2015121245 A (PIONEER ELECTRONIC CORP) 02 July 2015 (2015-07-02) the whole document	1-10

☐ Further documents are listed in the continuation of Box C.

☑ See patent family annex.

* Special categories of cited documents:

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

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"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	Date of mailing of the international search report
12 December 2016	**22 December 2016**

Name and mailing address of the ISA/CN	Authorized officer
STATE INTELLECTUAL PROPERTY OFFICE OF THE P.R.CHINA **6, Xitucheng Rd., Jimen Bridge, Haidian District, Beijing 100088** **China**	**LI,Weiwei**
Facsimile No. **(86-10)62019451**	Telephone No. **(86-10)62085325**

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2016/100650

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
US 2009256665 A1	15 October 2009	TW 200942712 A	16 October 2009
US 3860300 A	14 January 1975	None	
CN 202992581 U	12 June 2013	None	
DE 102007040159 A1	26 February 2009	None	
JP 2015121245 A	02 July 2015	None	