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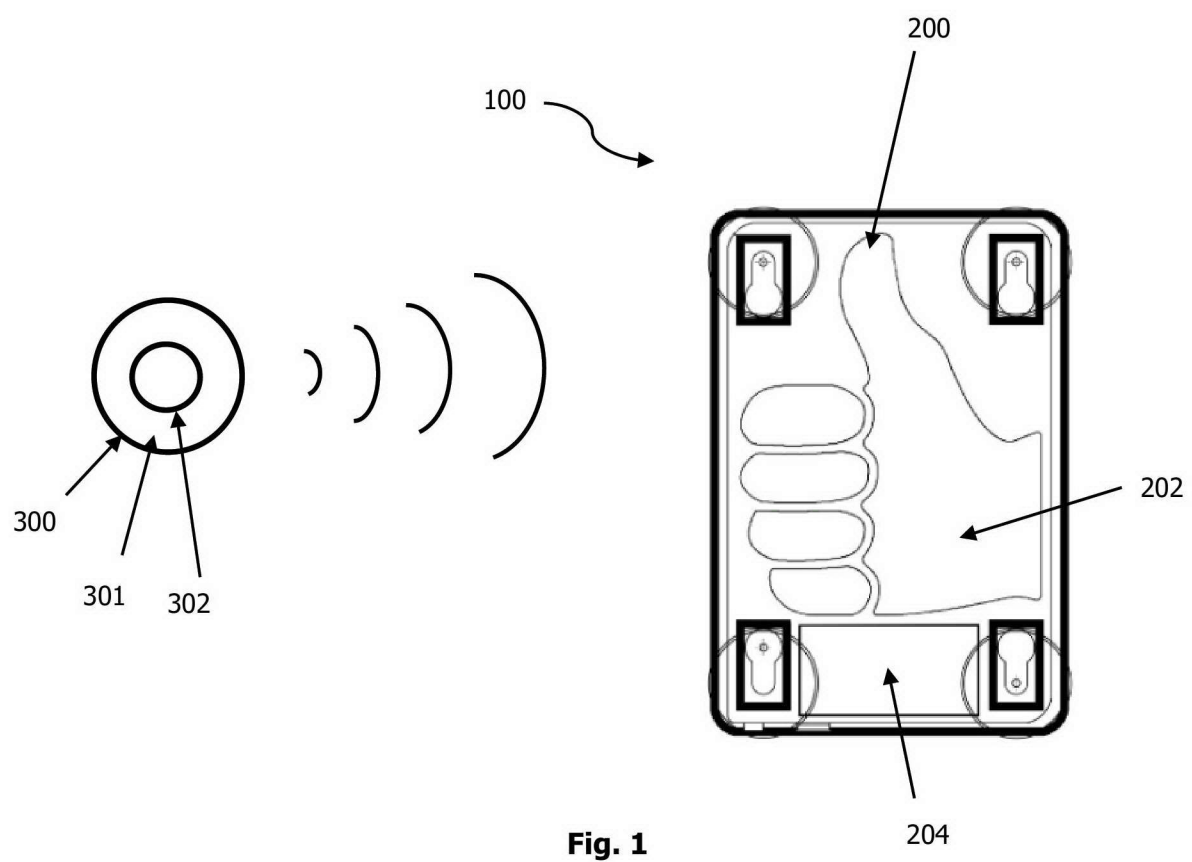
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Signalling device and method

Abstract

A signalling device (100) comprising a transmitter (300) having a button (302); and
a remote display panel (200) in communication with the transmitter (300);
wherein the transmitter button (302) is selectively operable to send a signal to the
remote display panel (200);
further wherein the display panel (200) is adapted to display a visual graphic object
(202) in response to the signal.



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Standard Patent Specification

Title: Signalling device and method

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The following is a full description of the invention which sets forth the best method known to the applicant of performing it.

Signalling device and method

Technical Field

[0001] The present disclosure relates to a signalling device and method. In particular, the invention is directed to automotive signalling. However, it will be appreciated by those skilled in the art that the invention may be applied to other applications.

Background of the Invention

[0002] Road rage has become increasingly common in recent years. With increased traffic in our major cities, drivers are forced to spend more time in congested conditions. Traffic jams and other such delays result in some drivers having reduced tolerance with respect to those around them.

[0003] Other factors such as busy day to day lives and high stress levels result in drivers having reduced patience. Incidents of road rage are increasingly prevalent in the media.

[0004] During driving in congested conditions, drivers often need to make a lane change. For example, this can occur when there is a merge of lanes resulting from a reduction of the number of available lanes. Alternatively, other situations and driving scenarios will necessitate that a person changes from one lane to another.

[0005] When the traffic conditions are light, making a lane change is straight forward, and the driver can simply indicate and veer from one lane to the next. However, when the traffic conditions are more congested, it can be more difficult to make the lane change, as it often requires that a driver in the intended lane permits entry by slowing down.

[0006] However, the act of merging/lane changing can irritate some drivers, especially when traffic conditions are already challenging.

[0007] If the driver in the intended, adjacent lane does not permit entry, this can cause a driver to miss their intended turn-off. Alternatively, in a merge situation, a driver may be forced to stop or dramatically slow their speed and wait for a suitable break in the traffic, or alternatively wait for another driver to permit ingress into the lane.

[0008] A recent trend involves drivers using the vehicle hazard lights and/or indicators as a way of thanking another driver for permitting entry. Whilst this practice provides a means of expressing gratitude to another driver, it is not an ideal driving practice. For one, hazard lights are strictly speaking intended for use in emergency situations, such as when a car is

experiencing a mechanic fault or breakdown, or when a dangerous situation is occurring, such as animals on the road.

[0009] Accordingly, the use of the hazard lights or indicators in a gratitude scenario can be confusing. For example, another driver who is not aware that the hazard lights have been deployed as a sign of gratitude may assume that some kind of dangerous event is unfolding. As such, the use of hazard lights in non-hazard situations is not advisable, and may be against the law in many states and countries.

[0010] Another common signalling method is to wave to drivers in other vehicles as a means to gesture thanks. This practice can be dangerous, as it is common for a driver to take their attention and focus away from the road, especially during the process of looking in their rear view mirror to ensure the driver in the follow car notices the waving gesture. Similarly, it is common for drivers to wind down the window to make such waving gestures. This practice suffers from the same inherent drawbacks of taking the driver's mind and field of vision away from the road in front of the vehicle.

Object of the Invention

[0011] It is an object of the present invention to substantially overcome or at least ameliorate one or more of the above disadvantages, or to provide a useful alternative.

Summary of the Invention

[0012] In a first aspect, the present invention provides a signalling device comprising:
a transmitter having a button; and
a remote display panel in communication with the transmitter;
wherein the transmitter button is selectively operable to send a signal to the remote display panel;
further wherein the display panel is adapted to display at least one visual graphic object in response to the signal.

[0013] The display panel preferably includes a first array of light emitting diodes (LEDs) which is adapted to display the visual graphic.

[0014] The graphic object preferably includes a diffuser located in front of the first array of light emitting diodes (LEDs).

[0015] The display panel preferably includes a second array of light emitting diodes (LEDs), and the display panel is adapted to toggle between the first and second arrays of light emitting diodes (LEDs) to display alternating graphic objects.

[0016] The signalling device further preferably comprises a first layer of transparent thermoplastic or glass located adjacent to a surface of the display panel, the signalling device further comprising a first array of light emitting diodes (LEDs) adapted to illuminate the thermoplastic or glass.

[0017] The signalling device further preferably comprises a second layer of transparent thermoplastic or glass located adjacent to the first layer of transparent thermoplastic or glass, the signalling device further comprising a second array of light emitting diodes (LEDs) adapted to illuminate the second layer of thermoplastic or glass.

[0018] The first and second layers of transparent thermoplastic or glass are preferably edge lit.

[0019] The thermoplastic or glass is preferably coloured.

[0020] The display panel preferably has a digital screen.

[0021] The display panel is preferably adapted to be internet connected to download alternative visual graphic objects in the form of icons and/or text.

[0022] The visual graphic object is preferably selected from one or more of a "thumbs up" image, a smiley face, a waving hand, THANKS, or THANK YOU or a downloadable graphic.

[0023] The remote display panel preferably includes at least one suction cup mount.

[0024] The transmitter button is preferably back lit and adapted to light up after pressing to confirm to a user that a signal has been sent to the remote display panel.

[0025] In a second aspect, the present invention provides a method of signalling including the steps of:

installing a transmitter having a button on or near the steering wheel of a vehicle;
and

installing a remote display panel on or near a rear windshield of the vehicle, the display panel being in communication with the transmitter;

pressing the button to send a signal to the remote display panel to display at least one visual graphic object.

[0026] In a further aspect, the present invention provides a signalling device comprising:
a transmitter having a button; and
a remote display panel in communication with the transmitter;
wherein the transmitter button is selectively operable to send a signal to the remote display panel;

further wherein the display panel is adapted to display at least one visual graphic object in response to the signal;

further wherein the transmitter button is back lit and adapted to light up after pressing to confirm to a user that a signal has been sent to the remote display panel;

further wherein the display panel includes an internal tilt switch that it configured to switch the display panel off if the display panel is upside down.

[0027] In a yet further aspect, the present invention provides a method of signalling including the steps of:

installing a transmitter having a button on or near the steering wheel of a vehicle;
and

installing a remote display panel on or near a rear windshield of the vehicle, the display panel being in communication with the transmitter;

pressing the button to send a signal to the remote display panel to display at least one visual graphic object, wherein the button is back lit and adapted to light up after pressing to confirm to a user that a signal has been sent to the remote display panel, and wherein the display panel includes an internal tilt switch that it configured to switch the display panel off if the display panel is upside down.

Brief Description of the Drawings

[0028] A preferred embodiment of the invention will now be described by way of specific example with reference to the accompanying drawings, in which:

[0029] Fig. 1 is a schematic view depicting a signalling system according to the invention;

[0030] Fig. 2 is a side view of the signalling system of Fig. 1;

[0031] Fig. 3 is a rear view of the signalling system of Fig. 1;

[0032] Fig. 4 is a bottom view of the signalling system of Fig. 1;

[0033] Figs. 5A to 5C are circuit diagrams for the signalling system of Fig. 1;

[0034] Figs. 6A to 6F are circuit diagrams for the signalling system of Fig. 1;

[0035] Fig 7 is a circuit diagram of an LED arrangement for the signalling system of Fig. 1; and

[0036] Figs. 8A to 8D are circuit diagrams for the signalling system of Fig. 1;

[0037] Fig. 9 is a flow chart of the display panel operation of the signalling device;

[0038] Fig. 10 is a flow chart of the signalling device; and

[0039] Fig. 11 is a flow chart of a transmitter of the signalling device.

Detailed Description of the Preferred Embodiments

[0040] There is disclosed herein a signalling device 100 intended generally for automotive use, and in particular for use with cars and trucks. However, it will be appreciated by those skilled in the art that it may also be used with other vehicles such as motorcycles or bicycles.

[0041] The signalling device 100 includes a display panel 200 and a remotely positioned actuator or transmitter 300.

[0042] The signalling device 100 is primarily used to provide a mechanism to gesture gratitude to other drivers, and as such it may be deployed in various driving scenarios, such as when a merge or lane change is permitted, or just when thanks is needed.

[0043] In practice, the display panel 200 is intended to be positioned inside the rear windscreen of a car or truck. The display panel 200 may be secured to the window with suction caps (for example four suction cups) as depicted in Figs. 1, 2 and 4. Alternatively, double sided tape or another suitable fastening means may be used. Alternatively, the display panel 200 may be located on a surface, such as the parcel tray behind the rear seats, where it is visible through the rear window.

[0044] The display panel 200 is preferably positioned on the inside rear windscreen where it does not significantly obstruct the driver's vision. A good location is on the driver's side in the bottom right hand corner. This placement minimises obstruction of the driver's view, and is also located in front of the driver to which gratitude is being expressed. The display panel 200 is generally rectangular in shape, and is about 150mm x 85mm x 20mm. However, it will be appreciated by those skilled in the art that the display panel 200 may be made in different sizes.

[0045] When used with trucks, the display panel 200 may be mounted to a rear portion of the rear most trailer, for example on a rear cargo door. If placed external to the vehicle, the

display panel 200 may be secured with tamper proof screws or some other fastening means to reduce the risk of theft. It may also be housed in a protective transparent casing.

[0046] The display panel 200 may be provided in a waterproof casing to ensure it can be used safely and continuously outside the vehicle.

[0047] In one embodiment, on the rear surface of the display panel 200 there is a battery compartment for holding batteries such as 3 x AA batteries.

[0048] In another embodiment, there is an internal rechargeable battery which is connected to a solar panel 204. The display panel 200 may also have a port to receive a low voltage charging cable, such as a 5 volt cable.

[0049] The display panel 200 is adapted to display one or more graphic objects 202 in the form of images, icons or text, of a suitable size to be noticeable by the drivers of other vehicles. In a preferred embodiment, the graphic object 202 presents a depiction of a "thumbs up" image. However, it will be appreciated by those skilled in the art that the graphic object 202 could be text such as "THANKS" or "THANK YOU". The intention of the graphic object 202 is to convey a positive, laudatory message to other drivers.

[0050] In one embodiment, the display panel 100 includes an internal tilt switch. The tilt switch switches the display panel 200 off if the display panel 200 is upside down. This prevents the message on the panel 202 being upside down, and hence prevent the use from displaying a thumbs down message, which has negative connotations.

[0051] In a preferred embodiment, there is a small green LED located on the back top right corner which when activated will flash in time with the main, front graphic object 202. This indicates to the driver that the batteries are charged and operational.

[0052] In an alternative embodiment, the display panel 200 includes a speaker which generates an audible beep or other sound to alert the user to a low batter scenario.

[0053] In a preferred embodiment, the graphic object 202 is defined by a lighting element, such as an array of LED lights. However, it will be appreciated that the graphic object 202 may be made in other ways, such as using neon lights or a digital screen.

[0054] The graphic object 202 may be provided as a single colour, for example, a green light, or an array of green lights. However, it will be appreciated by those skilled in the art that other colours or combinations of colours may be utilised.

[0055] There are several graphic objects 202 which may be used. For example, the "thumbs up logo". Alternatively, the graphic objects 202 may be provided in the form of an illuminated hand that waves back and forth, the text "THANK YOU", or a stylised smiley face.

[0056] When the user wishes to activate the display panel 200, the user pushes a button 302 located on the transmitter 300. The transmitter 300 is positioned in readily accessible location, such as on the steering wheel, or somewhere on the console or nearby, such that the driver can readily access the button 302. Importantly, the button 302 is located in a position where it does not interfere with the vehicle airbags. For example, if there are airbags located at the centre of the steering wheel, the button 302 is not to be positioned in the same region of the wheel.

[0057] The button 302 is back lit, so that after a user presses the button 302, it lights up to prove that it has correctly functioned. This obviates the need for the driver to look in the rear view mirror to ensure the driver of the following vehicle noticed the signal. As such, there is little if any need for the driver to take their attention away from the road.

[0058] The transmitter 300 may be battery powered. Alternatively, it may be powered by an alternative power supply, such as connection to the vehicle battery system, or utilising a solar panel. Similarly, the display panel 200 may be battery powered or powered by an alternative power supply, such as connection to the vehicle battery system, or utilising a solar panel. The vehicle's electric system can be used to power both the transmitter 300 and/or the display panel 200.

[0059] The communication between the transmitter 300 and the display panel 200 may be wireless, for example using infrared signalling or radio frequency signalling. Alternatively, a cable may physically extend between and connect the transmitter 300 and the display panel 200. The cable can be routed through the chassis of the car, similar to the aerial cable of the vehicles antennae, such that the cabling is not visible within the cabin.

[0060] The transmitter 300 is placed in an easy to reach location for the driver, it can be placed on the dashboard or on a safe location on the steering wheel (away from airbags). The transmitter 300 may be secured with double sided tape. Alternatively, it may be unattached and free in the console. In one embodiment of the transmitter 300, it has a generally round casing 301 and a central button 302. The casing 301 is about 25mm in diameter. There is a thumb logo formed on the button 302. The thumb logo becomes back lit once the button 302 is pressed, so the driver can keep their attention direction forward.

[0061] Inside the casing 301 there is a printed circuit board and a battery (for example CR2025 3 volts). Once the button 302 is pressed, it activates the battery which powers the printed circuit board. The printed circuit board is a transmitter. This transmits on a single frequency on the band 433.050-434.790 MHz ISM LPD433 (70-centimeter band) for Australia and most countries, or 863-870 MHz SRD860 EU (860 Mhz band) with a unique serial code to a distance of about 10 meters to the receiver. This means that each individual transmitter 300 is paired to the corresponding display panel 200, meaning that the activation of the button is unlikely to have an unintended effect on other nearby similar signalling devices 100, or unrelated devices.

[0062] An example of the operation of the signalling device 100 will now be described. The flow chart provided in Fig. 11 depicts the operational steps of using the signalling device 100. Fig. 9 provides a flow chart regarding the display panel operation of the signalling device 200 and Fig. 11 is a flow chart depicting the transmitter 300 of the signalling device 100.

[0063] During driving, if a driver is permitted to merge into an adjacent lane due to the actions of a courteous driver in the intended lane, the driver presses the button 302. As will be appreciated, the device 100 may be deployed in numerous other driving scenarios, such as exiting a parking place.

[0064] When the transmitter is activated, it sends a signal with an individual code, which is decoded in the receiver circuitry of the display panel 200. Every transmitter 300 and display panel 200 are paired together, with their own unique code. Once the receiver confirms the unique code is from its paired transmitter 300, the display panel 200 begins to display the graphic object 202.

[0065] The graphic object 202 may light up for a prolonged period of time, for example 5 - 10 seconds. Alternatively, the graphic object 202 may flash between on and off states for a period of time, for example 5 – 10 seconds. Alternatively, the graphic object 202 may only be illuminated during the period of time that the user presses the button 302. As such, the user can readily control the illumination time period.

[0066] Three embodiments of the display panel 200 are described below:

- In a first embodiment, a cut-out is located on a front surface of the display panel 200. There is a green diffuser that is fitted over the cut-out. Behind the diffuser are LEDs which flash 4 times rapidly (similar to indicators) when activated. In the

embodiment where the image is intended to appear to be moving (for example a hand waving) there are two sets of LED lights, representing first and second images.

- In a second embodiment there is piece of transparent thermoplastic or glass (such as Perspex) located over the cut-out. The Perspex may be coloured, for example having a transparent, green colouring. The Perspex is side lit with LEDs which flashes 3 times rapidly (similar to indicators) when activated. In the embodiment where the image is intended to appear to be moving (for example a hand waving) there are two layers of Perspex, representing first and second images.
- In a third embodiment, the display panel 200 has is a full colour digital screen. In this embodiment the display panel 200 may be internet connectable such that the user may select downloadable icons. In this embodiment, the user can customise and change the icons or text to suit their own preferences over time.

[0067] Advantageously, the device 100 obviates the need to use the hazard lights or indicators, or physically waving which can be confusing, and even illegal in some jurisdictions when used to gesture thanks.

[0068] In one embodiment, the graphic object 202 may depict a symbol or text intended to convey a negative sentiment to a discourteous or dangerous driver.

[0069] In one embodiment, the display panel 200 may have separate positive and negative graphic objects 202. In this embodiment, there are separate buttons, such that the driver can select the desired graphic object 202 for a given situation.

[0070] Advantageously the signalling device 100 promotes healthier driving habits and increases the likelihood of drivers acting courteously, whilst at the same time reducing road rage.

[0071] Although the invention has been described with reference to specific examples, it will be appreciated by those skilled in the art that the invention may be embodied in many other forms.

The claims defining the invention are as follows:

1. A signalling device comprising:
a transmitter having a button; and
a remote display panel in communication with the transmitter;
wherein the transmitter button is selectively operable to send a signal to the remote display panel;
further wherein the display panel is adapted to display at least one visual graphic object in response to the signal;
further wherein the transmitter button is back lit and adapted to light up after pressing to confirm to a user that a signal has been sent to the remote display panel;
further wherein the display panel includes an internal tilt switch that it configured to switch the display panel off if the display panel is upside down.
2. The signalling device of claim 1, wherein the display panel includes a first array of light emitting diodes (LEDs) which is adapted to display the visual graphic.
3. The signalling device of claim 2, wherein the display panel includes a diffuser located in front of the first array of light emitting diodes (LEDs).
4. The signalling device of claim 3, wherein the display panel includes a second array of light emitting diodes (LEDs), and the display panel is adapted to toggle between the first and second arrays of light emitting diodes (LEDs) to display alternating graphic objects.
5. The signalling device of claim 1, further comprising a first layer of transparent thermoplastic or glass located adjacent to a surface of the display panel, the signalling device further comprising a first array of light emitting diodes (LEDs) adapted to illuminate the thermoplastic or glass.
6. The signalling device of claim 5, further comprising a second layer of transparent thermoplastic or glass located adjacent to the first layer of transparent thermoplastic or glass, the signalling device further comprising a second array of light emitting diodes (LEDs) adapted to illuminate the second layer of thermoplastic or glass.

7. The signalling device of claim 6, wherein the first and second layers of transparent thermoplastic or glass are edge lit.
8. The signalling device of any one of claims 5 to 7, wherein the thermoplastic or glass is coloured.
9. The signalling device of claim 1 wherein the display panel has a digital screen.
10. The signalling device of claim 9, wherein the display panel is adapted to be internet connected to download alternative visual graphic objects in the form of icons and/or text.
11. The signalling device of any one of the preceding claims, wherein the visual graphic object is selected from one or more of a "thumbs up" image, a smiley face, a waving hand, THANKS, THANK YOU or a downloadable graphic.
12. The signalling device of any one of the preceding claims, wherein the remote display panel includes at least one suction cup mount.
13. The signalling device of any one of the preceding claims, wherein the remote display panel includes a solar panel adapted to charge an internal battery.
14. The signalling device of claim 13, wherein the remote display panel includes a low voltage input port adapted to charge the battery.
15. A method of signalling including the steps of:
 - installing a transmitter having a button on or near the steering wheel of a vehicle; and
 - installing a remote display panel on or near a rear windshield of the vehicle, the display panel being in communication with the transmitter;
 - pressing the button to send a signal to the remote display panel to display at least one visual graphic object, wherein the button is back lit and adapted to light up after pressing to confirm to a user that a signal has been sent to the remote display panel, and wherein the

display panel includes an internal tilt switch that it configured to switch the display panel off if the display panel is upside down.

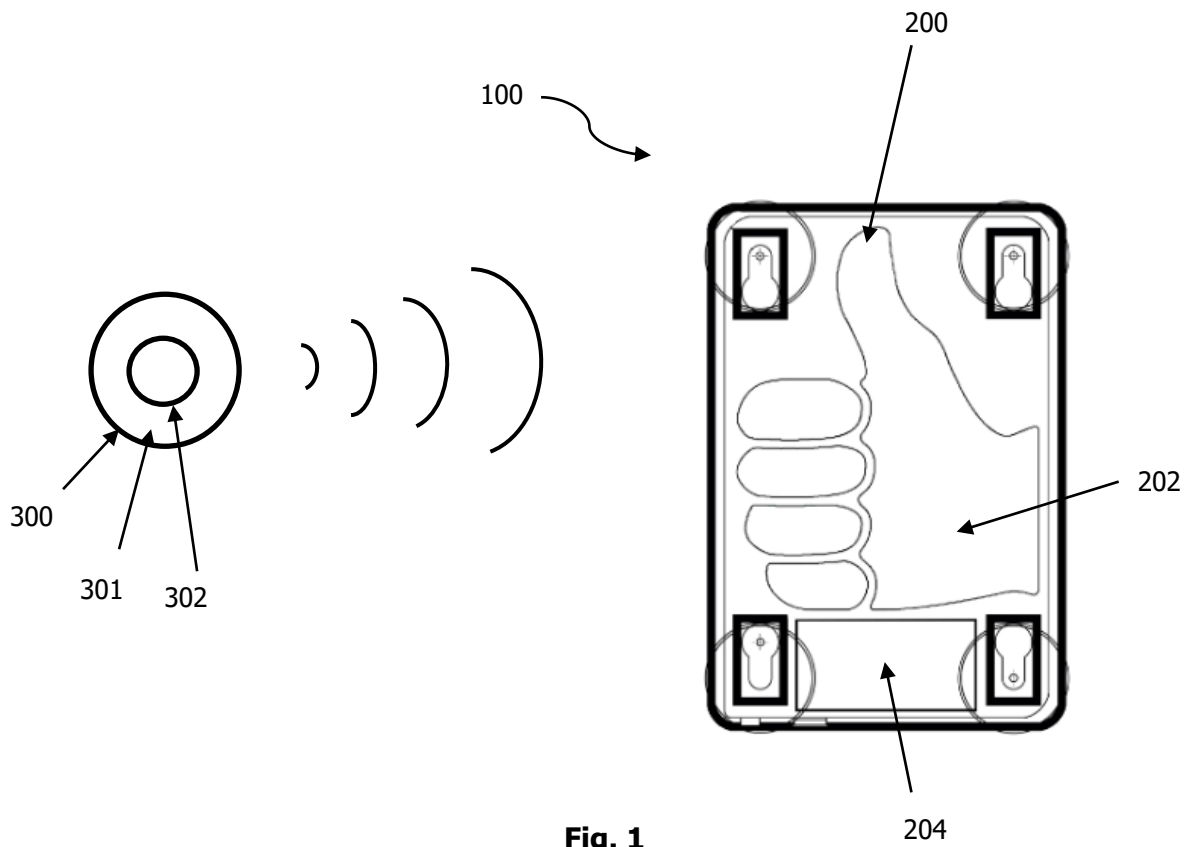


Fig. 1

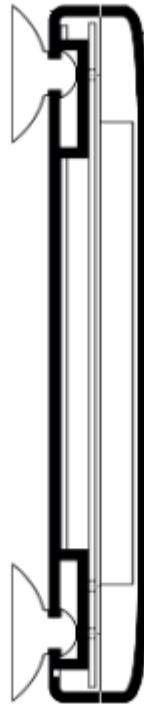


Fig. 2



Fig. 3



Fig. 4

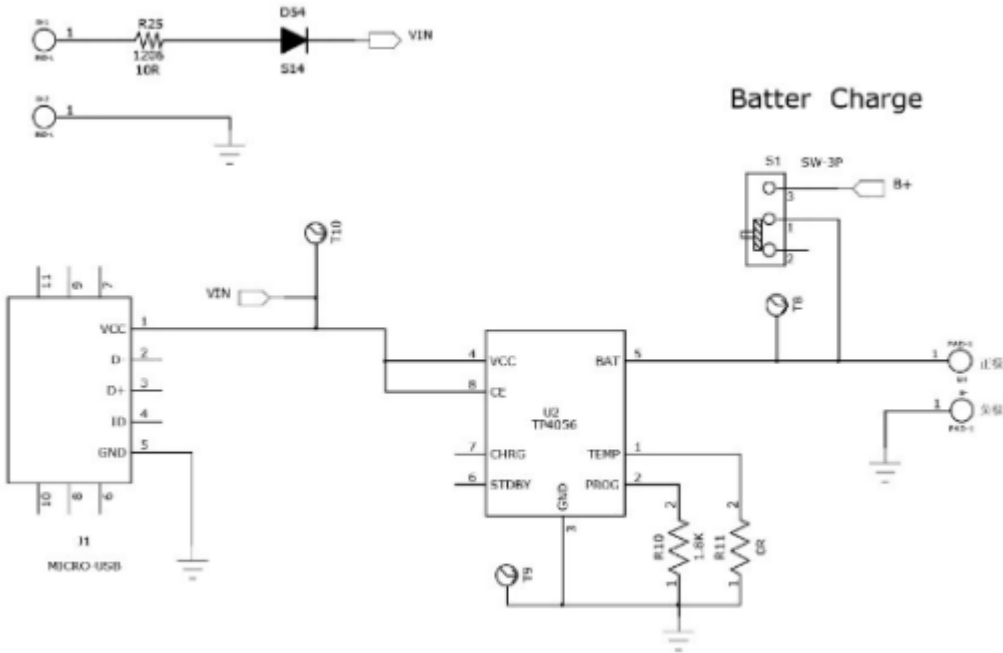


Fig. 5A

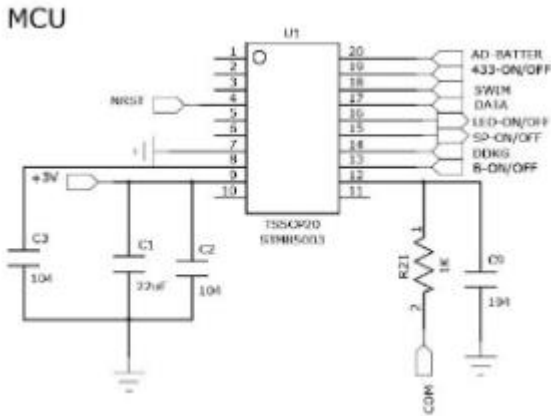


Fig. 5B

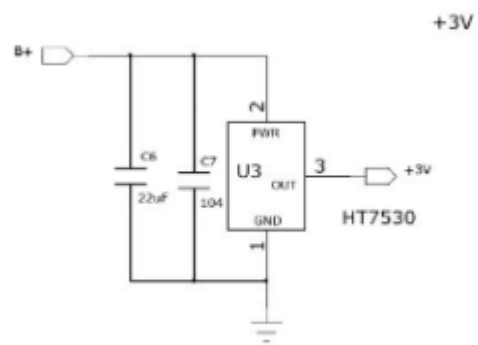


Fig. 5C

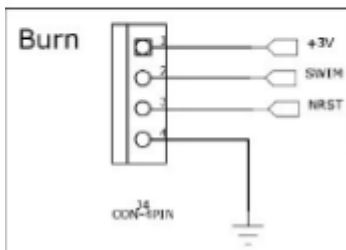
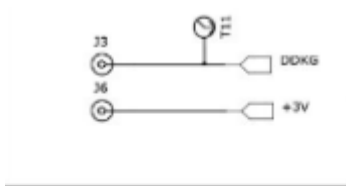


Fig. 6A

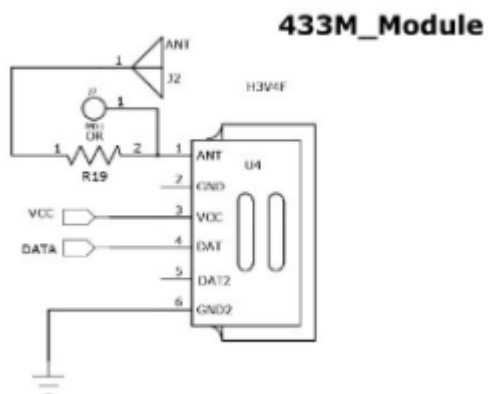


Fig. 6B

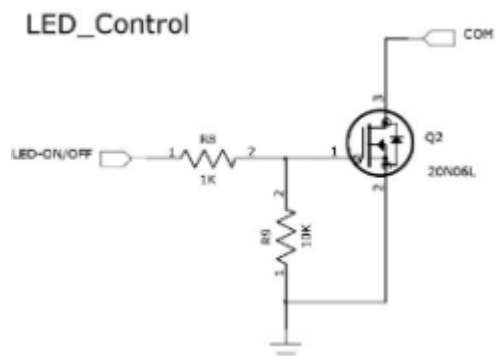


FIG. 6C

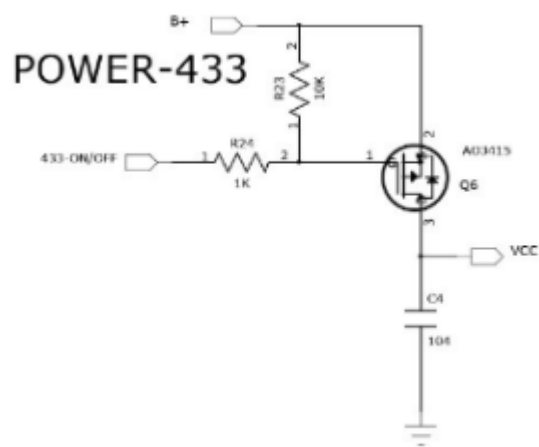


Fig. 6D

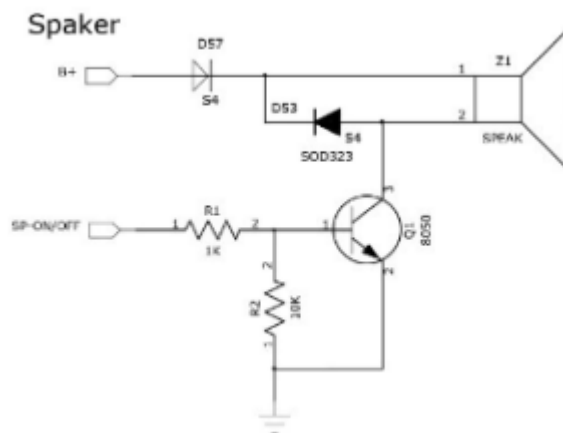


Fig. 6E

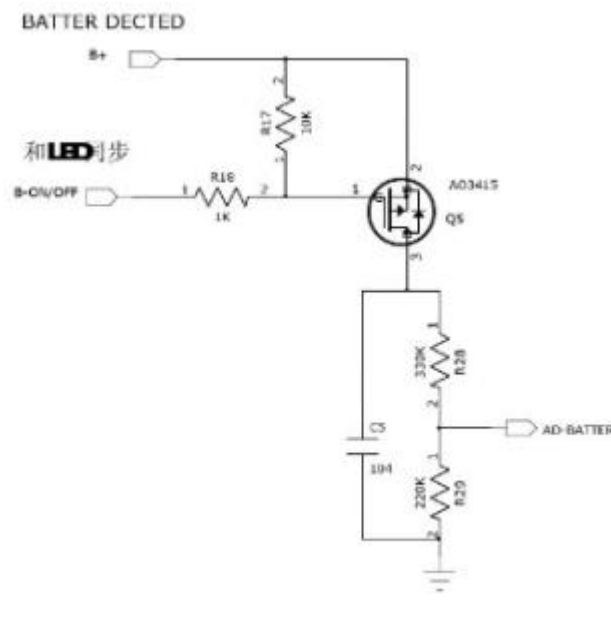


Fig. 6F

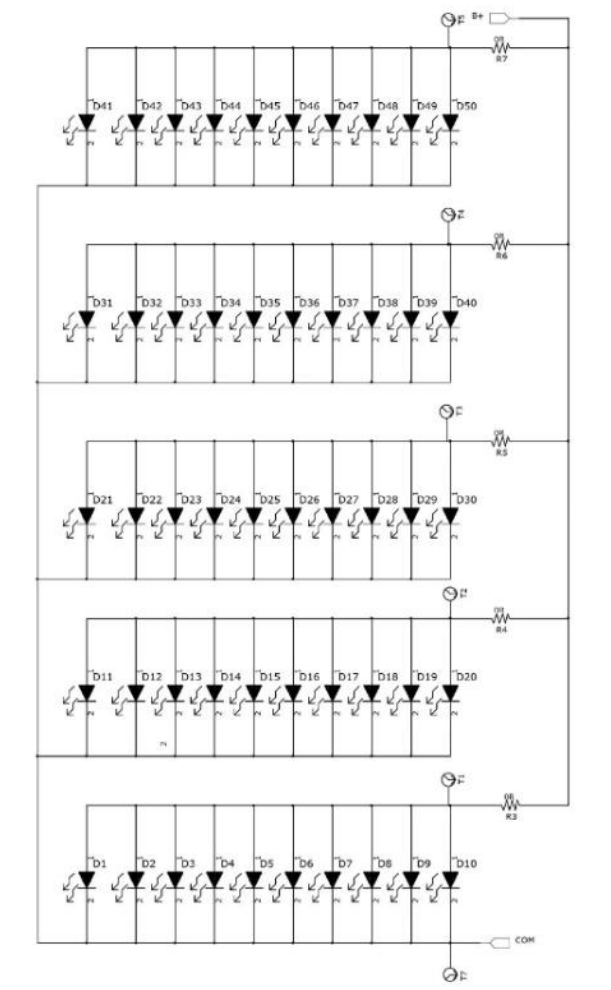


Fig. 7

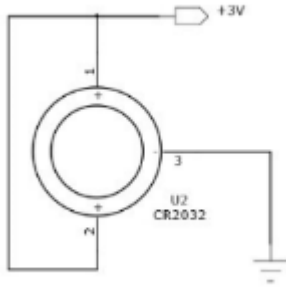


Fig. 8A

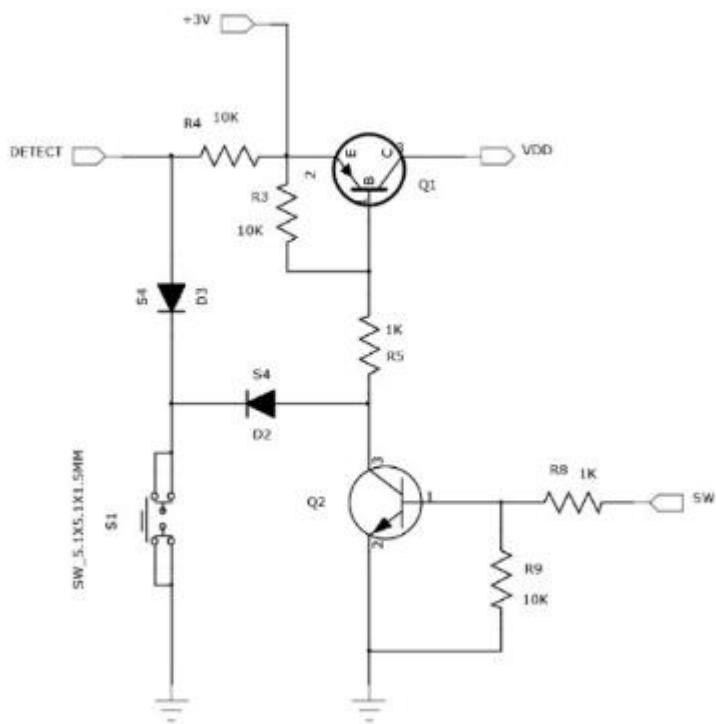


Fig. 8B

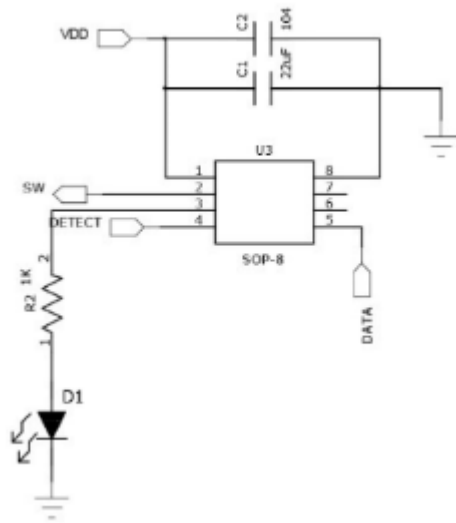


Fig. 8C

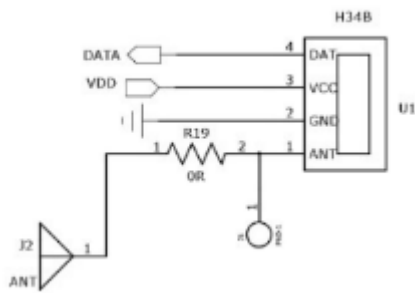


Fig. 8D

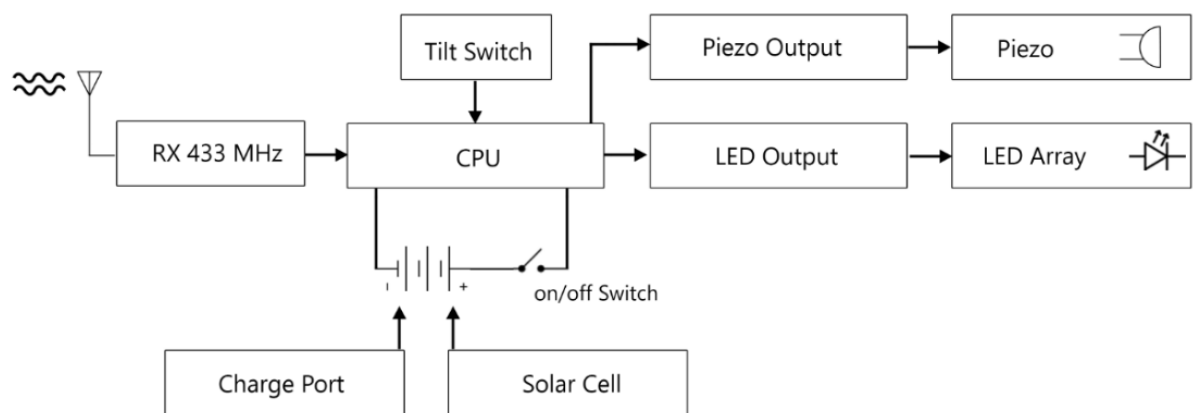


Fig. 9

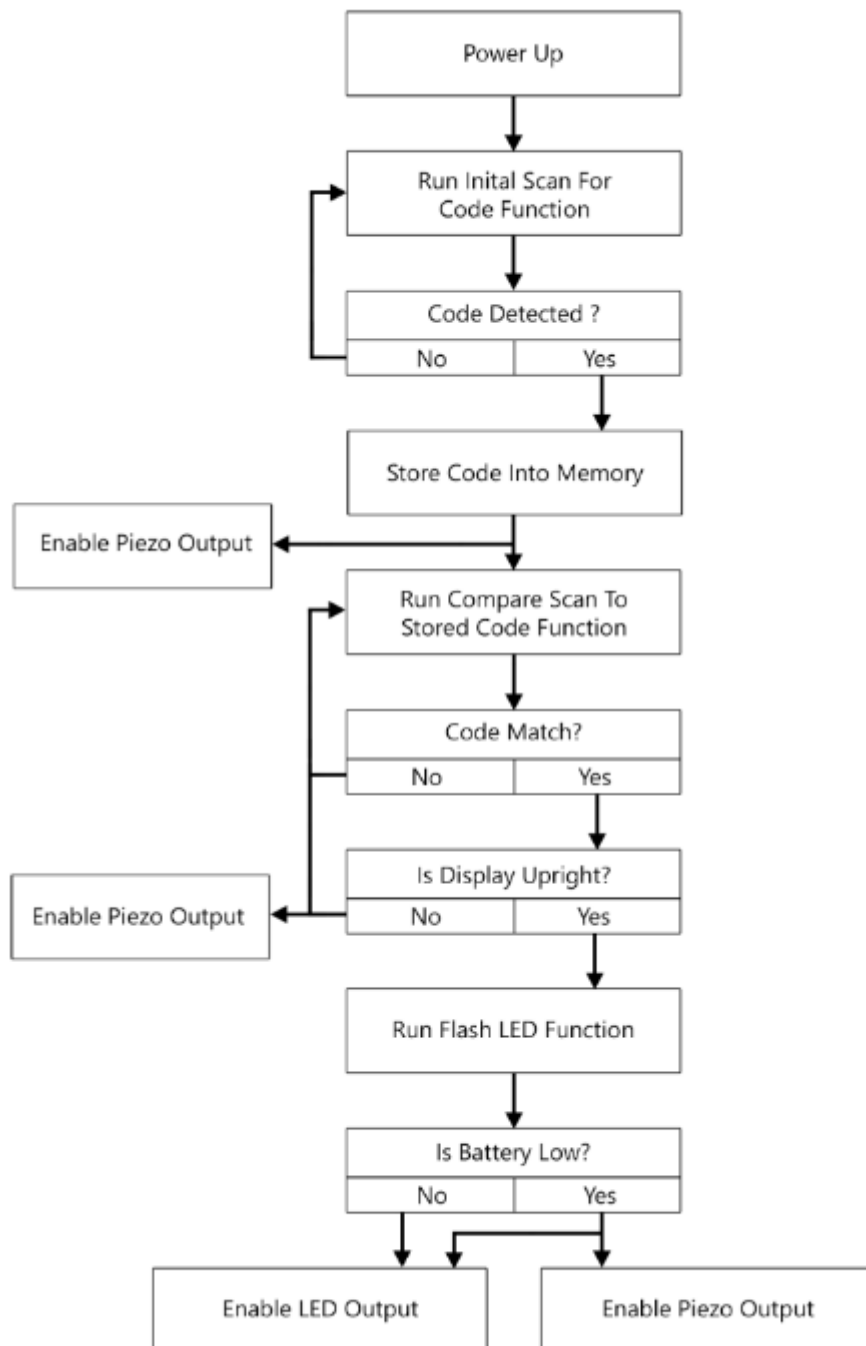


Fig. 10

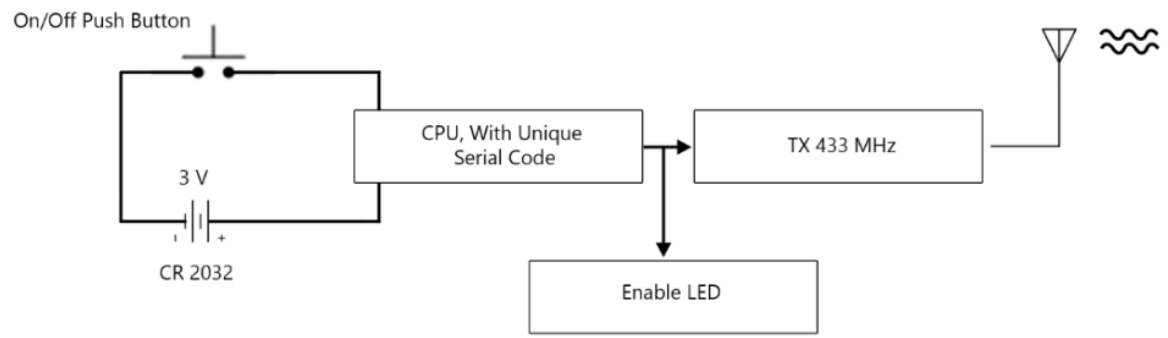


Fig. 11