

## Personal Alert Response Receiver (PARR)

This invention relates to a device for individual emergency real-time alert messaging for impending circumstances and danger, natural or man-made, via signals from satellite based alarm system, including sub-division with real-time rescue-activated feature, from anywhere in the world, taking the form of an waterproof, robust, autonomous, portable, discrete unit designed for personal attachment, for example, a band to the body such as a watch style bangle.

This invention has been developed because of the predictions concerning global climate change which will inevitably mean new-coming disaster and a need for further response in developing a wide range of personal and public satellite alarm extension devices to address the gaps and needs in respect to early warning and the issues of natural and man-made disasters.

This invention engages developments which are current, proposed and projected in space-based and non-space-based technologies, such as: the trend for new integrated applications based on integration of data generated by several systems, space-based and non-space-based; the proposed developments of the satellite systems to be combined seamlessly and used optimally with terrestrial systems to deliver potential for the benefit of society; the projected developments of global terrestrial early warning systems for disaster reduction, for example, a global end-to-end tsunami early warning system; the development of satellite systems of systems; the development of international standards; the current development of a satellite based alarm system, for example, for global alert messaging on mobile telephones, and space-based early warning systems.

The personal alert response receiver unit has several advantages as a space-based personal emergency device. Reliance on the use of satellite telemetry as an alarm system allows the lag between a disaster event and the receipt of initial data to be reduced to the order of a few seconds, thus providing more time for regional early warnings and warnings in rapid disaster situations. The importance of a personal attachment device in rapid, ongoing and unpredictable crises is intended to cover the practical issue of missing out on a warning. The personal alert response receiver unit offers specific characteristics as a satellite alarm extension device. Firstly, it is multi-capacity, offering the possibility of adaptability and flexibility of response to disaster hazard, including details such as time of day, speed and cultural sensitivity. Secondly, by offering non-earth bound capability, there is the possibility of an independent, autonomous and de-centralised personal system from ground level

resource in the event of lack of already existing communication systems, existing system destruction or disruption caused by civil or military unrest.

The personal alert response receiver unit has several advantages as a space-based personal rescue device. It is intended for a wearer who is in distress and away from normal emergency services and requires distress relief. It offers multi-redundancy in rescue signalling, including all hybrid-assisted systems: for example, transmitting on 406Mhz (COSPAS-SARSAT), Global Navigation Satellite System (GNSS), i.e. GPS, Assisted GPS (A-GPS) and radio frequencies (RF).

The personal alert response receiver unit has a receiver for signals from satellite based alarm system as part of real-time preparedness in early warning for disasters, for example, Global Navigation Satellite System (GNSS), i.e. GPS. It transmits vibration to the wearer, including visual messaging informing of types of disaster, real-time urgency and situational awareness in terms of response. A sub-division of this invention is as above, adding, a rescue signal to locate, connected also to the Global Satellite Rescue Alert and Response Technology. When activated this unit transmits an alert to the Global Search and Rescue Network, who then know the whereabouts of the wearer.

The personal response alert receiver unit contains a power source from a built in re-rechargeable battery for several years together with low battery indicator.

The unit comes as a hybrid-assisted GPS system for signal conveyance outside and inside of buildings.

The invention will now be described solely by way of example and with references to the accompanying drawings in which:

**Figure 1** shows the personal alert response receiver unit, general appearance, including display and operating features.

Figure 2 shows the personal alert response receiver unit display screen with digital message and an example of early warning details of a hazard.

Figure 3 shows the personal alert response receiver unit with display screen where code alert status of hazard is additionally in terms of colour coding for degree of urgency.

Figure 4 shows the personal alert response receiver unit with additional features of vibration indication and aural indication.

**Figure 5** shows a sub-division of the original personal alert response receiver unit (Figs. 1 – 4), indicating a personal rescue beacon activation button with external antenna, general appearance, including display and operating features.

Figure 6 shows a sub-division of the original personal alert response receiver unit (Figs. 1 – 4), indicating a personal rescue beacon activation button with external antenna, display screen with digital message and an example of early warning details of a hazard.

Figure 7 shows a sub-division of the original personal alert response receiver unit (Figs. 1 – 4), indicating a personal rescue beacon activation button with external antenna, with display screen where code alert status of hazard is additionally in terms of colour coding for degree of urgency.

Figure 8 shows a sub-division of the original personal alert response receiver unit (Figs. 1 – 4), indicating a personal rescue beacon activation button with external antenna, with additional features of vibration indication and aural indication.

Figure 9 shows a sub-division of the original personal alert response receiver unit (Figs. 1 – 4), indicating a personal rescue beacon activation button in activated status with aural transmission, with external antenna in drawn-out position.

**Figure 10** shows a sub-division of the original personal alert response receiver unit (Figs. 1 – 4), indicating a personal rescue beacon activation button with internal antenna, general appearance, including display and operating features.

Figure 11 shows a sub-division of the original personal alert response receiver unit (Figs. 1 – 4), indicating a personal rescue beacon activation button with internal antenna, display screen with digital message and an example of early warning details of a hazard.

Figure 12 shows a sub-division of the original personal alert response receiver unit (Figs. 1 – 4), indicating a personal rescue beacon activation button with internal antenna, with display screen where code alert status of hazard is additionally in terms of colour coding for degree of urgency.

Figure 13 shows a sub-division of the original personal alert response receiver unit (Figs. 1 – 4), indicating a personal rescue beacon activation button with internal antenna, with additional features of vibration indication and aural indication.

Figure 14 shows a sub-division of the original personal alert response receiver unit (Figs. 1 – 4), indicating a personal rescue beacon activation button in activated status with aural transmission.

In **figure 1**, a personal alert response receiver unit is shown as a personal body attachment, such as a watch style bangle, waterproof, flexible and of high-impact engineered casing (1), with clasp or fastening feature for opening and closing (6).

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A light feature (4) shows battery operational status as an L.E.D. The button feature (5) is for a menu activation, to set language, time and date and other additional features. Centred on this is a display feature (3) an L.E.D screen on which digital messaging appears to describe hazard warning details, whilst a light feature (2), an L.E.D, shows active signal connection to satellite based alarm system.

With the personal alert response receiver unit attached, the wearer is ready to receive the zone hazard warnings and can check the active status connection to the satellite based alarm system at any time. The hazard warnings are also experienced by other aspects built into the unit, in terms of priority and sense adjustment. There is no need to have concern over loss of function in water based hazard.

In figure 2, a personal alert response receiver unit shows how a hazard warning (7) might appear on the display screen (3). The display screen shows early warning details such as the nature of the hazard, the hazard magnitude, hazard occurrence and prediction, the hazardous field of activity and a description of the field in more detail including situational awareness in terms of response, for example, protective measures, evacuative procedures and 'all-clear'. The screen display also includes date and time feature.

In figure 3, a series of personal alert response receiver units are shown in different colour code alert status via the display screen (3) in order to represent how the priority warning of the hazard situation is relayed as quickly as possible to the wearer, in order to take appropriate action. The personal alert response receiver unit is shown in neutral status (8), with a normal screen face. However, when a digital message relaying rapid on-coming hazard is signed, this is accompanied by the screen showing the colour red (9), indicating the severity of the approaching hazard in terms of speed. A hazard occurring in a relatively short time, though not instantaneous, is signified by the colour amber (10), whilst status warning of a creeping or slow approaching hazard is signalled by messaging accompanied by the colour green (11). All alert messaging features are switched off via the menu button (5). Examples of code red hazards might include earthquake, tsunami, tornado and nuclear accidents. Amber alerts might include flooding, cyclones, fire, whilst code

green represents creeping hazards, such as drought, locust swarming and epidemics.

In figure 4, a personal alert response receiver unit shows vibration indication, also aural indication (12), when transmitting in code Red (9) and code Amber (10) for priority of hazard warning. The vibration and beep alerts at regular intervals. Vibration and aural transmission sequences are switched off manually via the menu button (5).

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Deliberately designed as multi-alert, the unit is also intended to serve people unable to read or audibly impaired, though able to understand visual symbol in zones with specific on-going disasters. Additionally, the sound and vibration features take into account wearers who are sleeping or visually and/or audibly impaired. Adjustment feature is possible via the menu button to convert the sound feature to desired beep or vocal rendition of the warning.

**Figure 5** shows a sub-division of the original personal alert response receiver unit with figures 6, 7 and 8 still showing the warning functions of the original personal alert response receiver unit and the design of figures 2, 3 and 4 remaining, However the alternative version shows a personal rescue beacon activation button (13) together with an antenna feature (14).

With the alternative personal alert response receiver unit attached, figure 9, the wearer can signal distress relief by pressing the rescue-beacon activation button on appropriately (13), in a disaster situation for self and others. The antenna is drawn out vertically (15), to transmit the rescue signal. A self-test feature to test the tracking accuracy of the personal locator beacon within the personal alert response receiver unit, is switched on manually at menu button (5). The activation of the button is indicated aurally (16) by, for example a deep beep. This reflects frequency transmission from the unit in bursts of digital information to orbiting satellites with the capability to transmit a highly-accurate GPS location within the distress message.

**Figure 10** shows a sub-division of the original personal alert response receiver unit with figures 11, 12 and 13 still showing the warning functions of the original personal alert response receiver unit and the design of figures 2, 3 and 4 remaining, However the alternative version shows a personal rescue beacon activation button (13), with the antenna is internal and invisible to the wearer. Figure 14 shows the rescue feature activated as figure 9.

The necessity to design the personal alert response receiver unit with additional rescue-activated feature concerns predicted climate changes. For example, new areas will emerge as climatic risk hotspots. These areas are perceived as high risk because of lack of experience, preparedness and warning facilities - a lack of adaption to changing climate patterns at local level. Secondly, existing areas will have increased risk levels. These areas are perceived as more vulnerable because any effective disaster reduction measures will be easily reversed leading to an increase in mortality. Unlike a traditional personal locator beacon, the personal alert response receiver with rescue-feature is designed to be developed for wide-spread use globally. The design intention focuses on inclusiveness in terms of culture, ability and impairment.

## Claims

1. A personal alert response receiver unit comprises a personal attachment to the body for early warning from impending circumstances and/or danger using real-time alert messaging as a satellite based alarm extension device, including real-time rescue-activation signal conveyance, to all satellite systems and hybrid-assisted systems, for global coverage.
2. A personal alert response receiver unit according to claim 1, such as a watch style bangle with light features, including showing battery operational status and also active signal connection to satellites, button feature for menu activation and display screen for digital messaging to describe early warning details.
3. A personal alert response receiver unit according to claim 2, where the display screen indicates preceding warning details with all necessary written information, available in all languages, concerning the nature of the impending circumstances and/or danger together with additional built in features transmitting a reflection of this warning information simultaneously in aural, vibration and colour coding.
4. A personal alert response receiver unit according to claim 2, where the display screen indicates preceding warning details with all necessary symbolic information concerning the nature of the impending circumstances and/or danger together with additional built in features transmitting a reflection of this warning information simultaneously in aural, vibration and colour coding.
5. A personal alert response receiver unit according to claim 3, where all

necessary adaptations and/or additions for people with physical, mental and educational impairments and/or disabilities are included.

6. A personal alert response receiver unit, according to preceding claim 3, where the written digital message on the display screen shows details of the impending circumstances and/or danger in terms of the nature, magnitude, occurrence, prediction, field and/or zone of activity and description of the field and/or zone in more detail, situational awareness in terms of response such as protection and/or evacuation procedures with current date and time features, including all other necessary relevant early warning information.

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7. A personal alert response receiver unit, according to preceding claims 3 and 4, where the vocal message relays details of the impending circumstances and/or danger in terms of the nature, magnitude, occurrence, prediction, field and/or zone of activity and description of the field and/or zone in more detail, situational awareness in terms of response such as protection and/or evacuation procedures with current date and time features, including all other necessary relevant early warning information.
8. A personal alert response receiver unit according to claim 2, includes a rescue-beacon activation button with external antennae feature for the wearer to signal distress relief by manual deployment of the rescue-beacon activation button and by drawing out the antenna to transmit rescue signal.
9. A personal alert response receiver unit according to claim 2, includes activation button with internal antennae feature for the wearer to signal distress relief by manual deployment of the rescue-beacon activation button to transmit rescue signal.
10. A personal alert response receiver unit according to claims 8 and 9, including a rescue-beacon activation button for the wearer to signal distress relief by vocal deployment of the rescue-beacon activation button to transmit the rescue signal.
11. A personal alert response receiver unit according to all preceding claims containing an internal power source from built in rechargeable or sustainable system for very long duration coverage.

12. A personal alert response receiver unit according to all preceding claims for signal conveyance outside and inside buildings.

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### **Abstract**

Personal alert response receiver unit

A personal alert response receiver unit includes a personal attachment to the body with casing 1, and fastening feature 6, an L.E.D light screen to display digital messaging of impending circumstances and danger together with button features 5, to activate the menu settings and personal rescue beacon activation 13 for distress signal relief and accompanying antenna drawn for activation 14, with additional L.E.D light features 4, to show battery operational status and 2, to show active signal connection to satellite system.

Figures 1 and 5 to accompany abstract



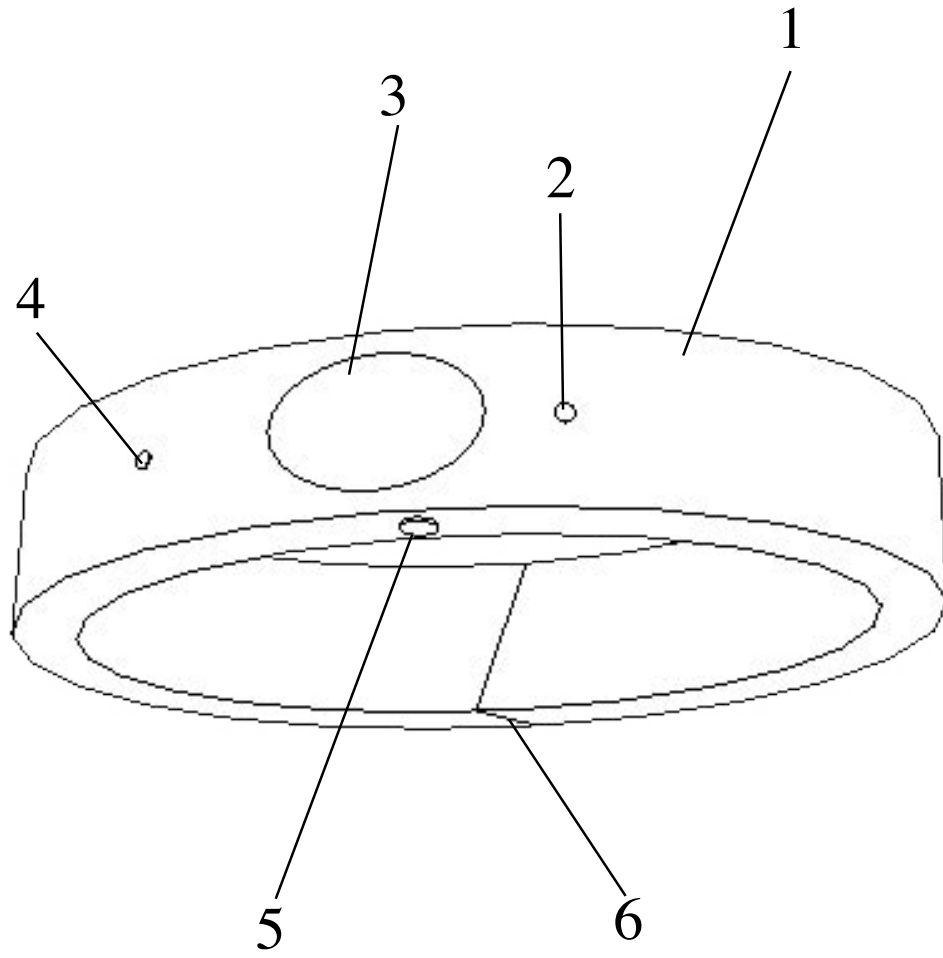


Figure 1

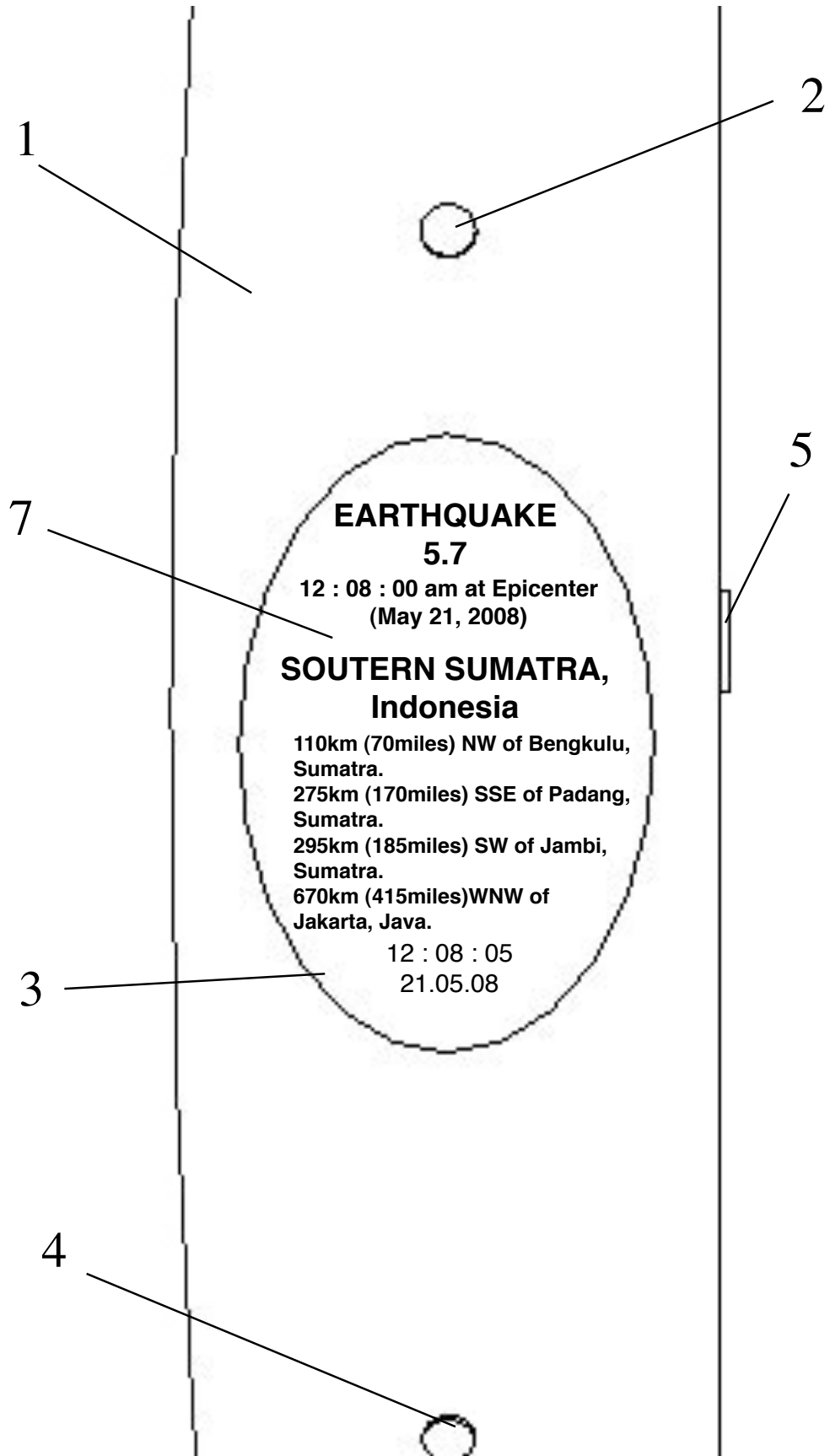


Figure 2

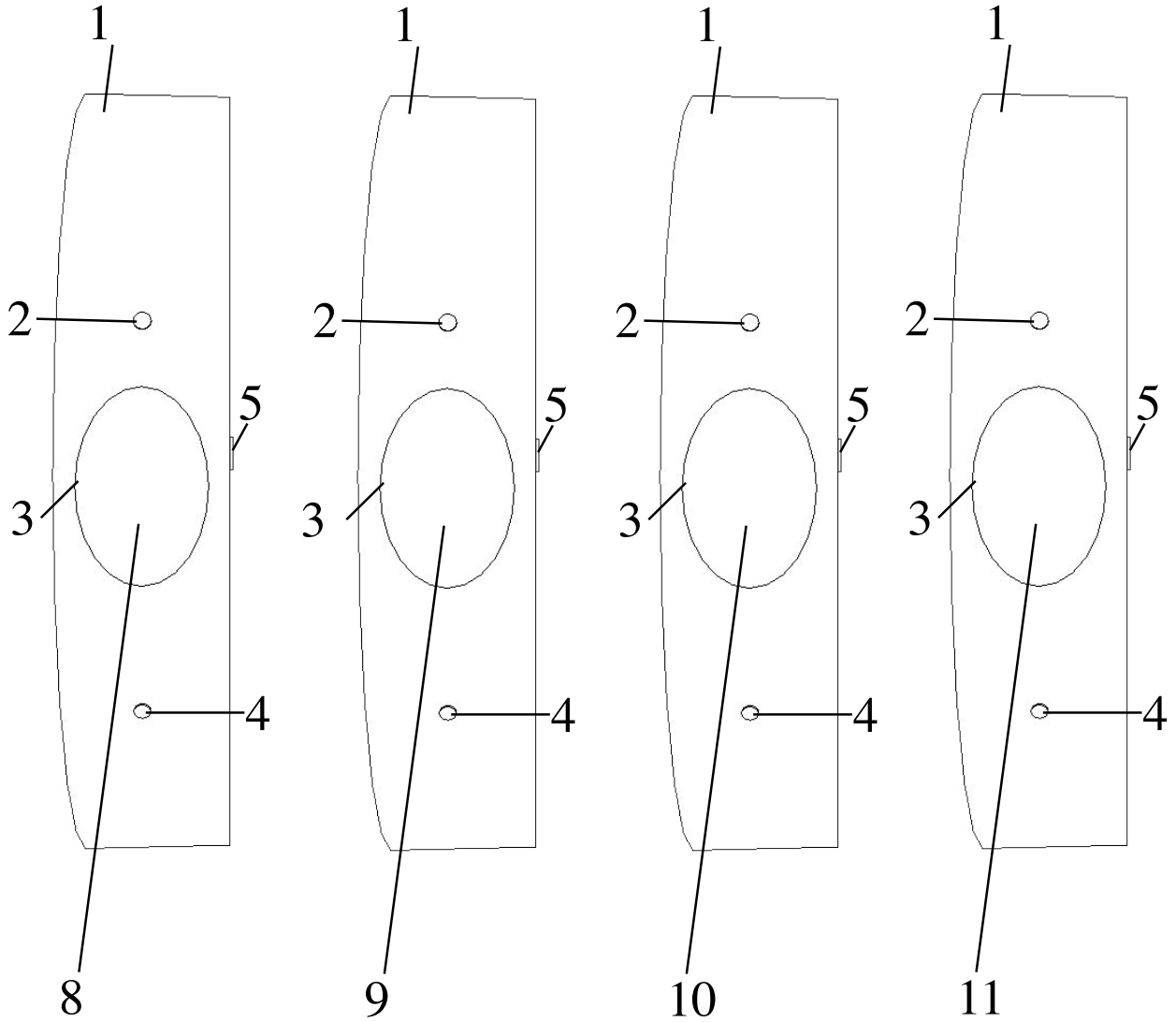


Figure 3

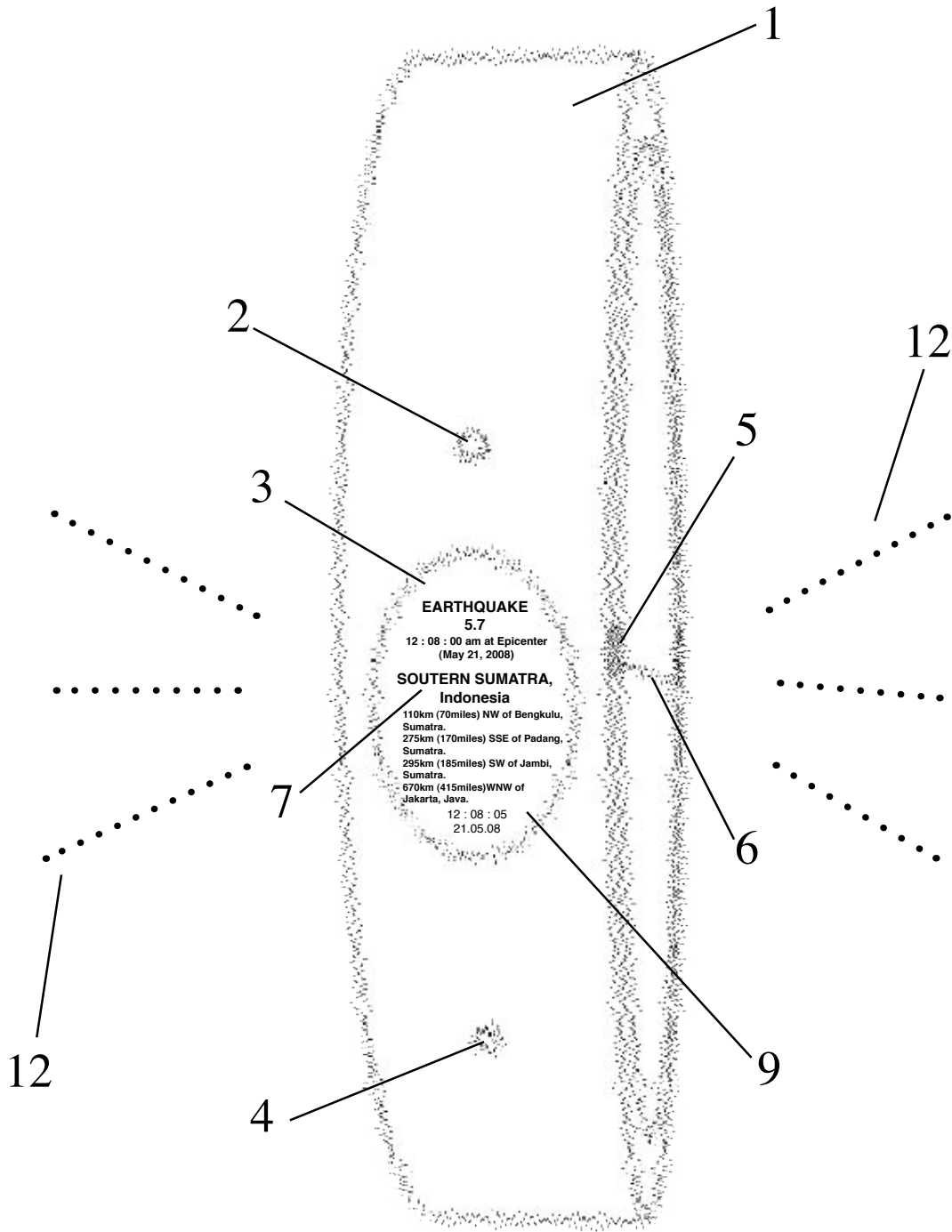


Figure 4

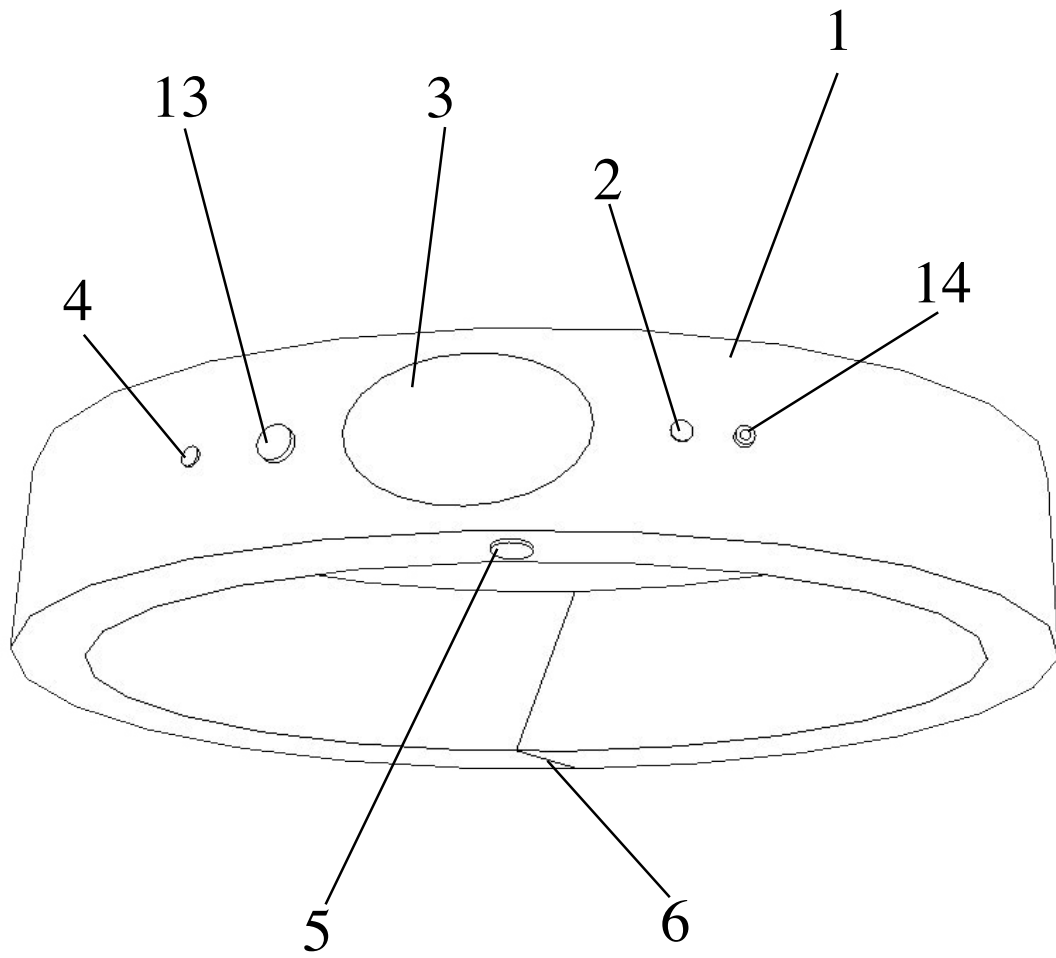


Figure 5

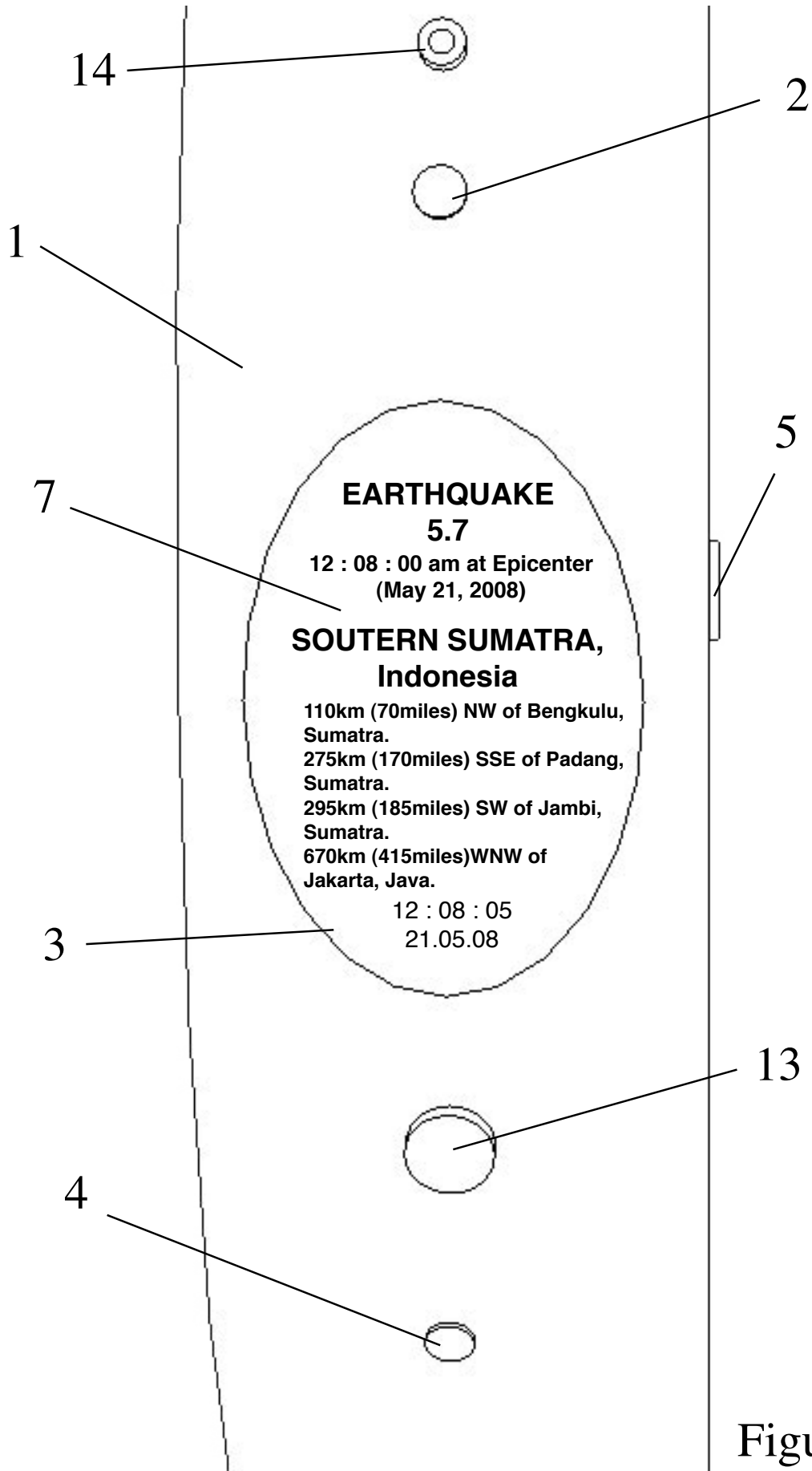


Figure 6

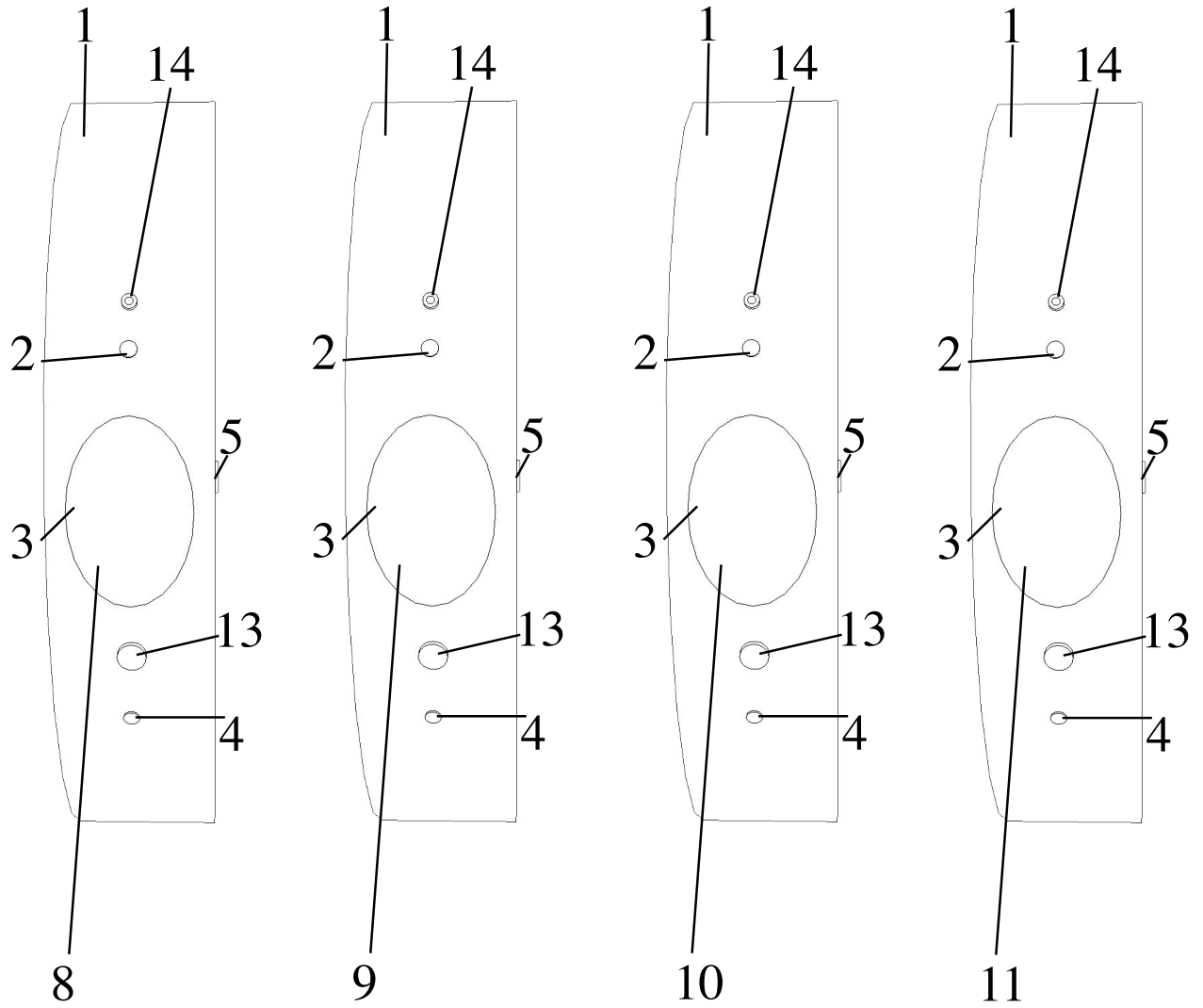


Figure 7

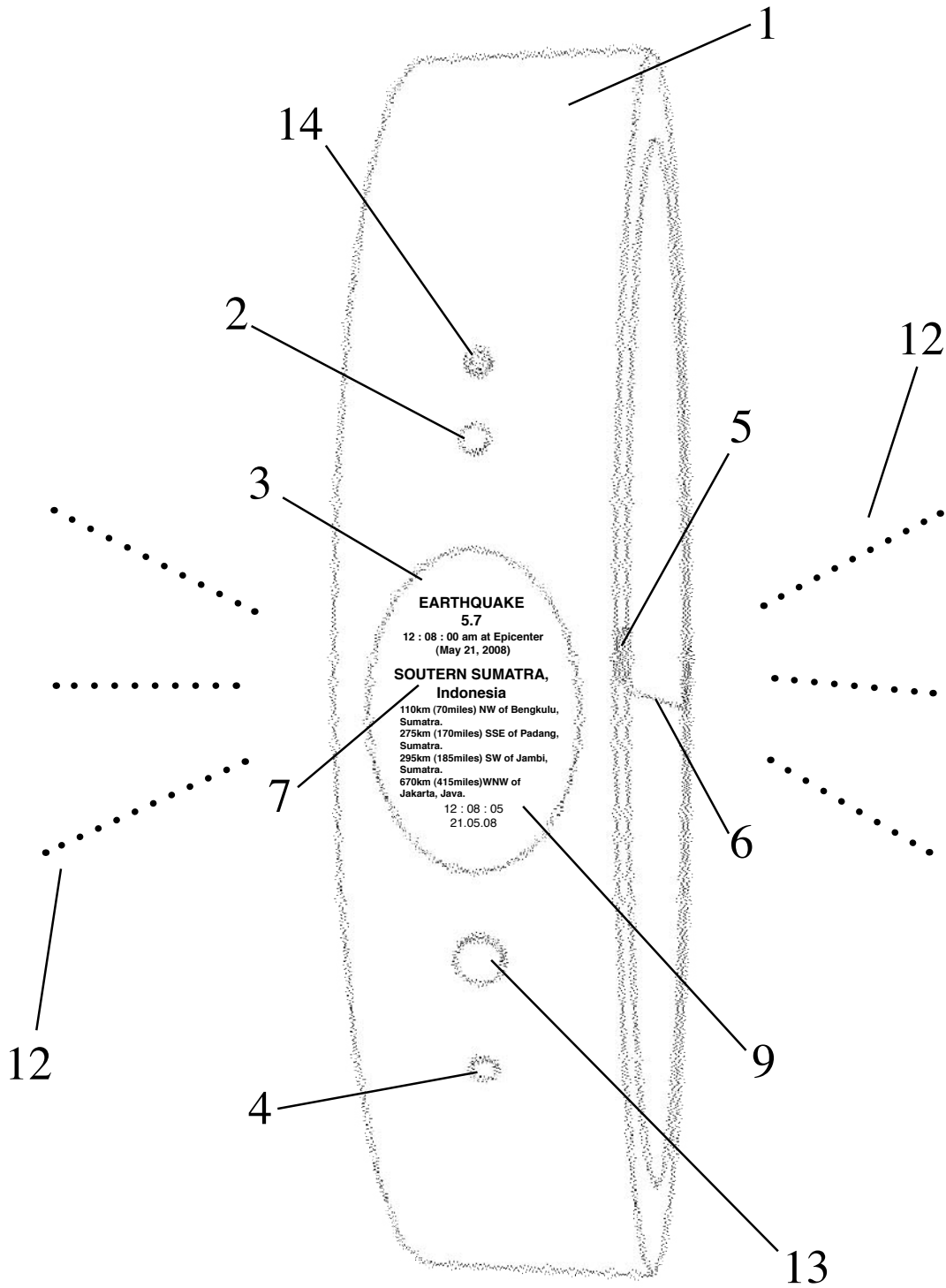


Figure 8



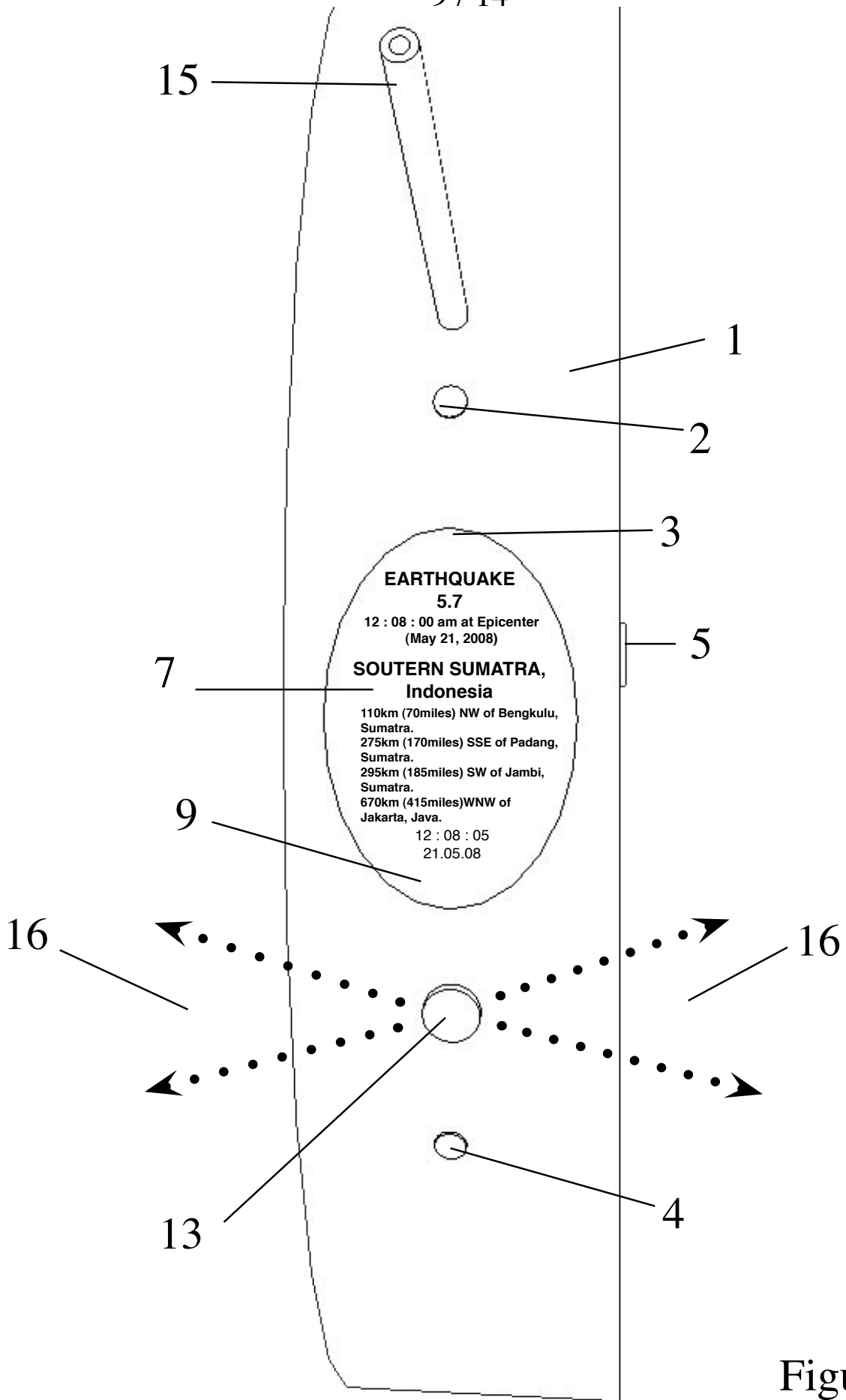


Figure 9

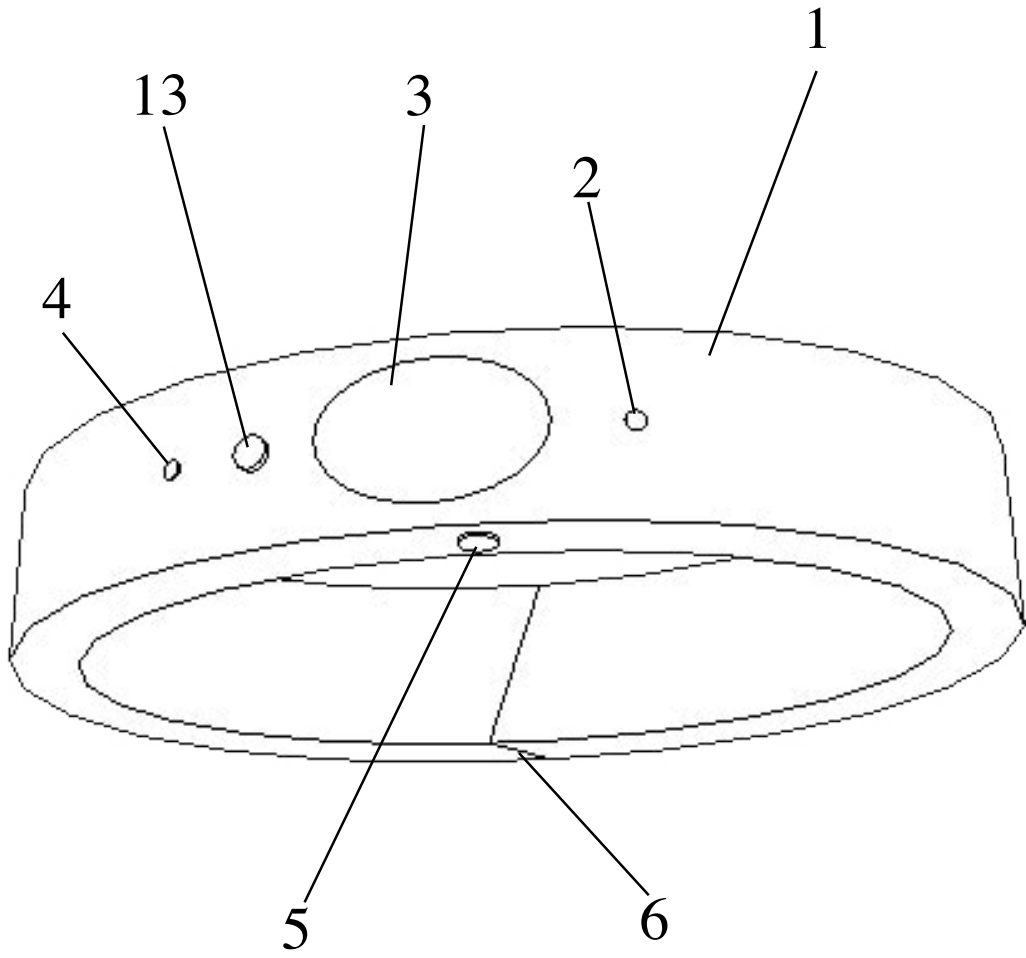


Figure 10

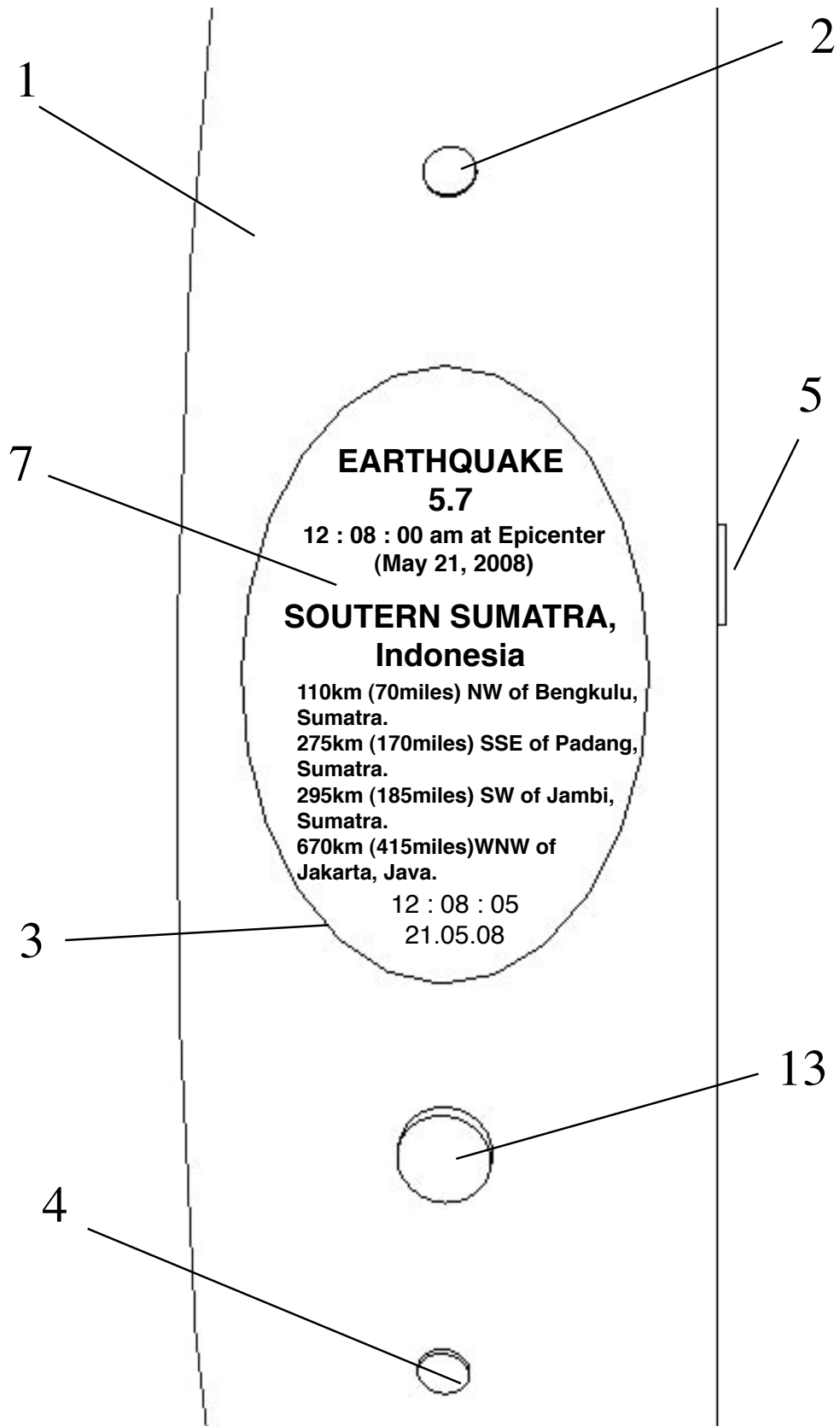


Figure 11

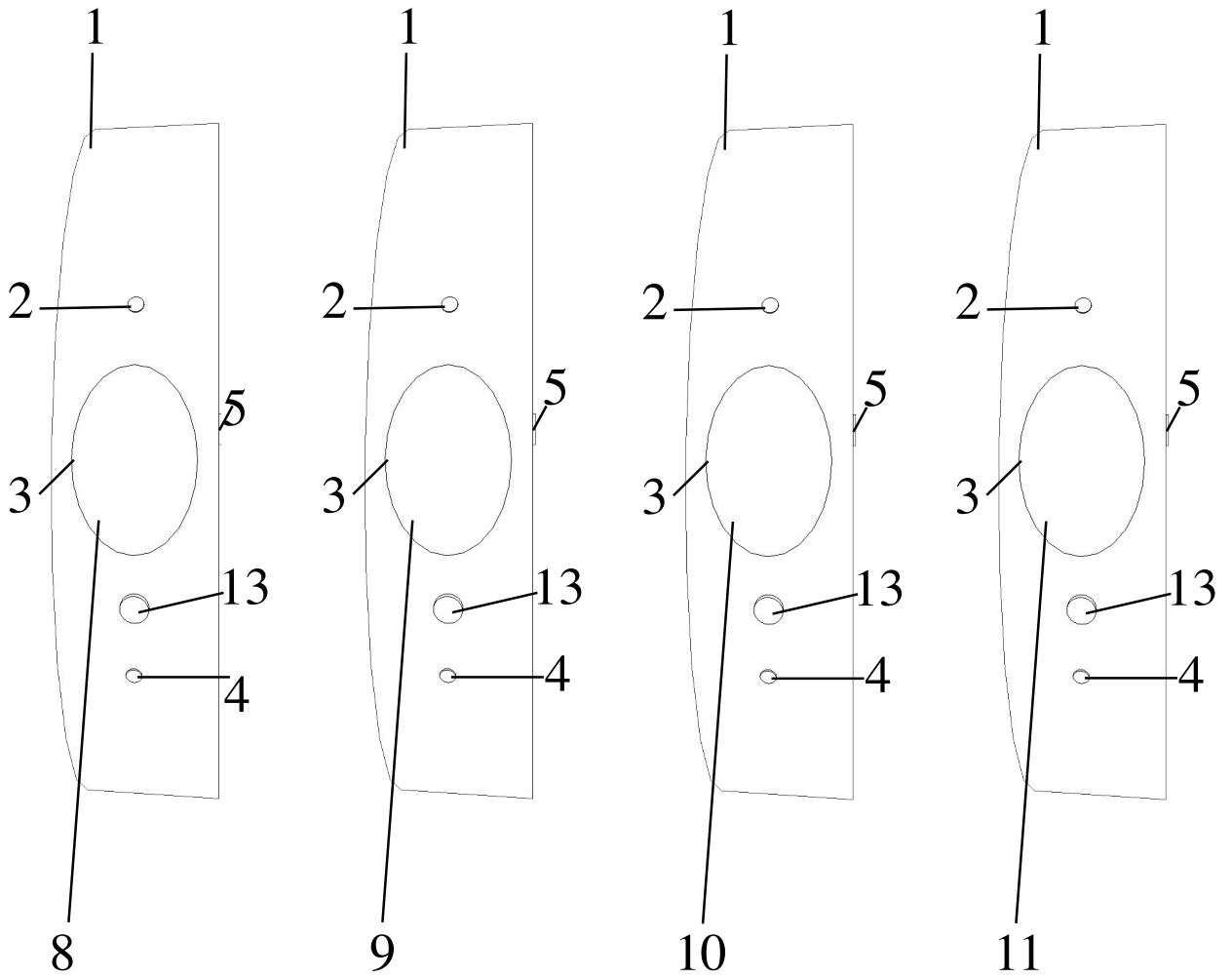


Figure 12

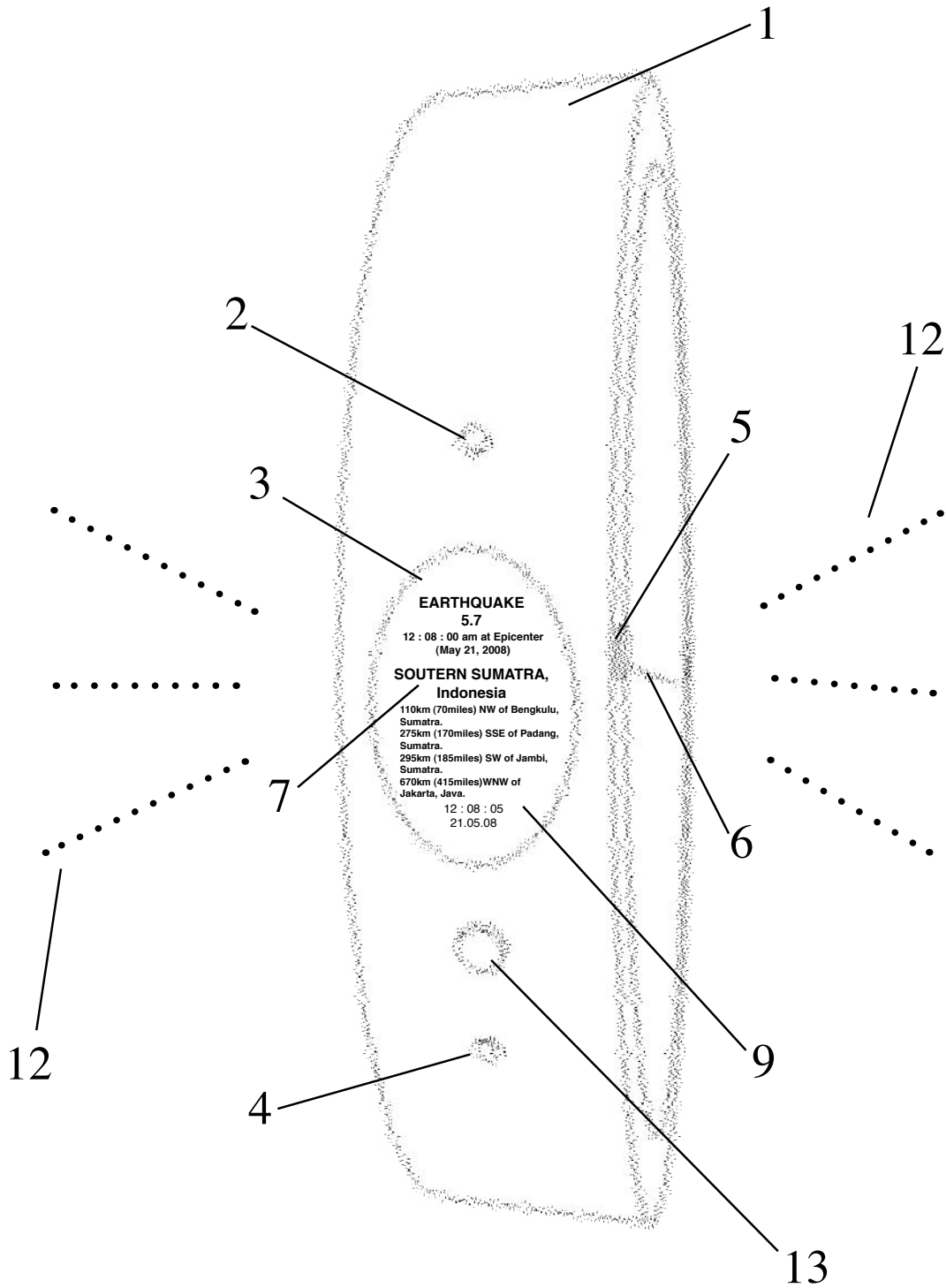


Figure 13

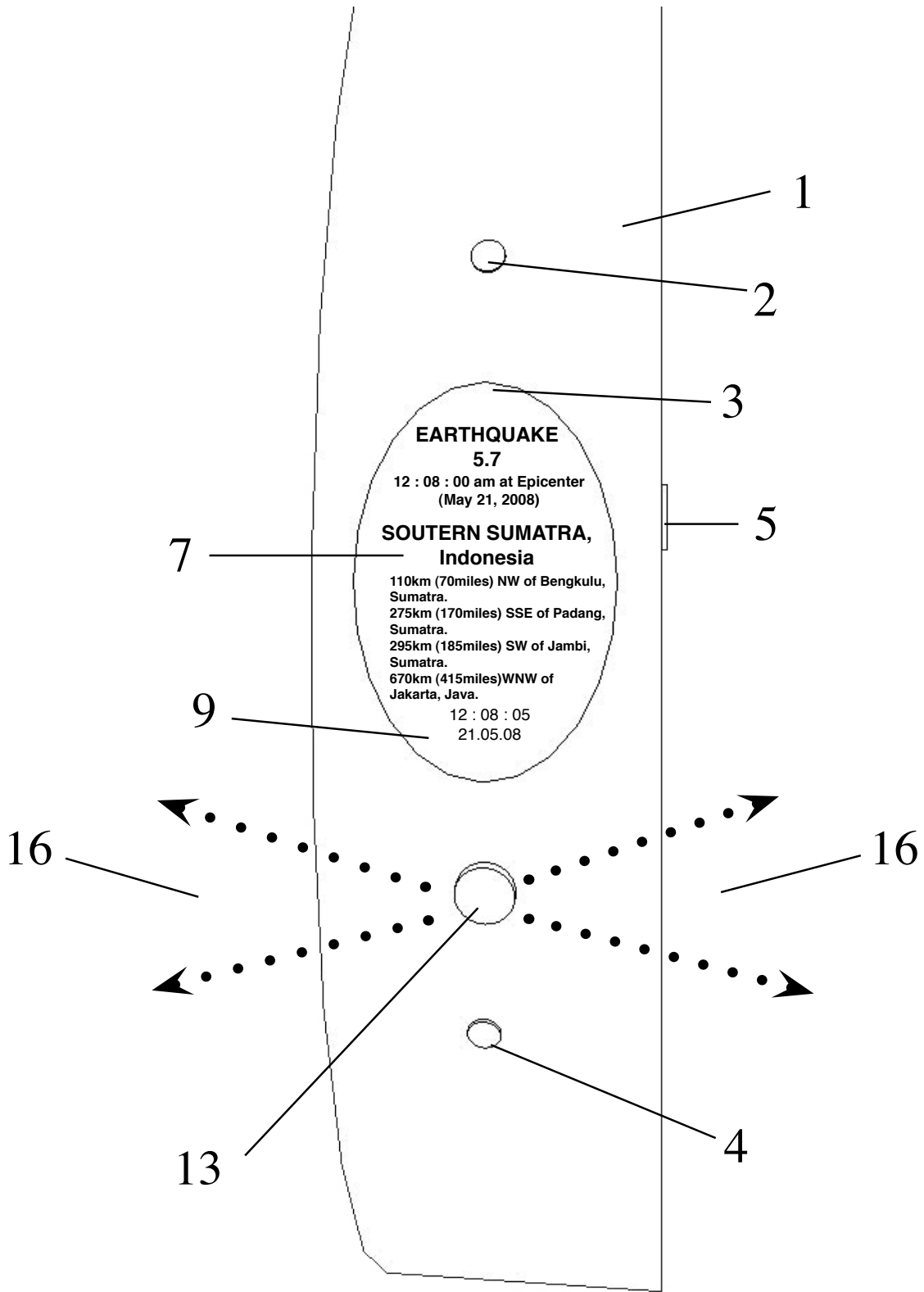


Figure 14