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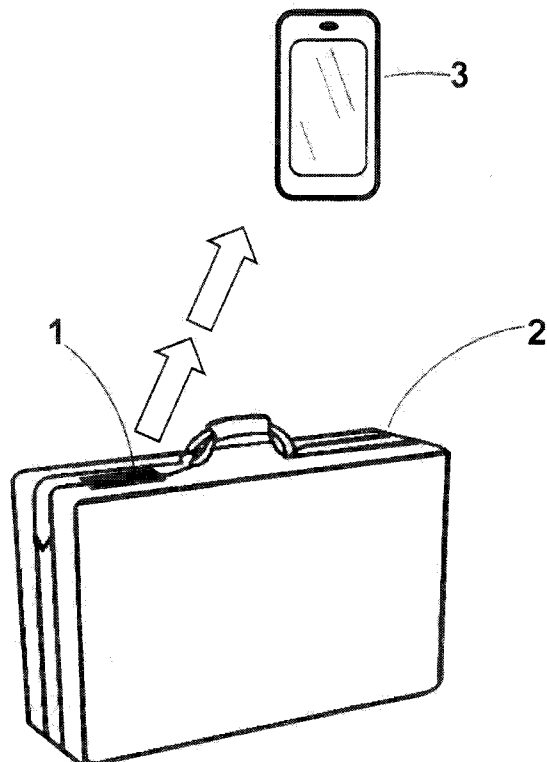
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[Continued on next page]

(54) Title: SUITCASE OR BRIEFCASE TAMPER ALERT USING BLUETOOTH

FIGURE 1



(57) Abstract: A suitcase or briefcase 2 tamper alert using Bluetooth wherein, a device 1 is moreover derived as two self-adhesive strips 1A which are magnetic, one of which is connected to a battery fed processor and Bluetooth sender unit 4, these are placed inside the chosen case near the edge of the two opening sections 5 and 6, so as the case 2 is closed the two magnetic strips seat together and a magnetic field is formed which primes the device, as the case is opened the two magnetic strips separate which breaks the field and switches on the magnetic switch, this alerts the processor which informs the Bluetooth sender 4 to forward a message to the user and their hand held device 3 that the case has been opened or tampered with. This message may include the time and period of opening as an example of two of a number of unlimited message details.

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SUITCASE OR BRIEFCASE TAMPER ALERT USING BLUETOOTH

FIELD OF THE INVENTION

5 The present invention relates to the prevention and alerting of the tampering or unwarranted opening of cases, including but not exclusively suitcases and briefcases.

BACKGROUND

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This invention relates generally to tamper-indicating devices, and more particularly to an improved device for use with personal baggage or luggage used by travelers. Monitoring the opening and closing of a secure container such as a suitcase is useful in determining whether the security of the container has been violated or
15 compromised. The present invention relates to an assembly which detects opening and closing of a suitcase, briefcase or container and provides an alert of such events which is transmitted to the owner via a Bluetooth method hidden inside the said case or container. The assembly includes a twin switch strip connected within the container. Opening and closing of the container parts the two strips which are
20 mounted to either side of the two opening sections of the case. When these strips are separated they alert the device which then submits a delivery signal via Bluetooth to a nearby located hand held device such as a smart phone or tablet owned by the user. This alert can be noted as a live event or recorded onto the device for perusal at a later time.

25

It is known in the art in the case of commercial containers to provide a so-called "wire seal" which is threaded through a lock clasp or similar closure in which the free ends of the length of wire are clamped with a malleable metal seal in such
30 manner that the container may be opened only by cutting the wire or damaging the seal, thus giving immediate notice to a consignee that the container has been tampered with, even if a principal closure remains in place. Such devices require a tool to cut the seal, and are not entirely free of the possibility of concealing the temporary opening of the seal portion. With increased use of air travel, literally

hundreds of pieces of luggage are loaded aboard a single aircraft or cruise ship, and when reclaimed by the owner, they are placed upon a moving platform for individual identification and retrieval. Most of the luggage is of soft type having minimum or no provision for locking, and when the pieces have been opened by
5 unauthorized persons, with possible loss of contents, this fact is not immediately noticeable until the luggage is unpacked at another location, and difficulty in making claim for loss is significantly increased.

Luggage is most often provided with either latches that lock on hard-side bags or
10 holes in the zippers or slide fasteners tabs on soft-sided bags to insert a locking device. Passengers have been locking their luggage for many, many years. However, since the Transportation Security Administration (TSA) has started to screen all checked luggage, they are suggesting that all passengers should leave their luggage unlocked so that any bag that appears suspicious can easily be
15 examined without damaging the latches or cutting locks. This presents airline passengers with a dilemma, should they lock their luggage and risk having their bags damaged or their locks cut; or should they leave their bags unlocked and take a chance that they will not be tampered with. Since the TSA has suggested that all luggage remain unlocked, there have been thousands of complaints of
20 luggage tampering; many of which have never been resolved. Unlocked luggage is always going to be a temptation for petty thieves.

Protection and detection of luggage tampering is not a new problem, in fact, U.S.
Pat. No. 1,472,381 to O. M. Bangs (Oct. 30, 1923) describes a seal reinforced with
25 a thin metal strip to be cemented to luggage in transit and not in the traveler's possession. This device would be an expensive way to seal a bag given that the airline passenger's bags will normally be only out of their possession for, at most, several hours. And, it does not address the problem of how to secure soft-sided bags; which happen to be the majority of the luggage handled by the airlines.

30 Another attempt to provide insurance against unauthorized opening of boxes or other containers is the U.S. Pat. No. 2,013,299 to J. A. Byrne (Sept. 3, 1935) which describes a specially designed gummed label that is signed by an authorized

person. While this invention was to be used by accountants to seal audit material, it could have also been used on luggage. However, the label is rather large and its unique shape would preclude its use on soft-sided luggage closed by using slide fasteners. Also, it is constructed using a multilayer approach which would require a special manufacturing process and tooling resulting in high unit cost. Most recently, several more attempts have been made to address the luggage tampering problem. U.S. Pat. No. 5,551,729 to B.R. Morgan (Sept. 3, 1996) shows a multilayer label which provides a space for the signature of the bag's owner. This label has two marketing defects, first its construction requires the deposition of many layers of material to provide the tamper indicating layer, and the applying of a special material to receive the signature imprint. This alone would make the label costly for a one time use. Secondly, the label is designed to be placed across a flat surface; which would make it difficult to use with slide fasteners. Also, applying the label to a non-flat surface would most likely cause the tampering layer to be comprised in the application process.

Another approach to provide a seal for both hard-sided and soft-sided luggage is described in U.S. Pat. No. 5,560,657 to B. R. Morgan (Oct. 1, 1996) which shows a tamper indicating label with an area for one's signature and a tongue that is designed to be used with both soft-sided bags with zippers and hard-sided bags where it can be secured across the opening by using two specially designed eyelets to engage the label's tongue. While the author claims that the label would be relatively inexpensive, the design indicates that the manufacturing processes would not allow it to be. Also, the need to use separate eyelets to secure hard-sided bags across their opening makes the device more complicated for the user and is one more factor to discourage passengers to use it.

A further approach to provide tamper indication using a label is shown in U.S. Pat. No. 5,893,587 to K. HE Wong (Apr. 13, 1999), where a large label bearing the passengers signature is used to provide both tamper indication and a receipt. The label is split into two or more parts and only a portion of the label is used to seal the bag. This approach is based on the premise that the tamper would prepare a new label and forge the passenger's signature. In the normal handling of airline

luggage, anyone attempting to tamper with a bag would probably not have sufficient time and/or material to forge one's signature. Most likely, given the shortage of time available to the potential tamperers, most thefts would not be a planned event. In addition, this type of label would not be easily applicable to slide fasteners or zippers on soft-sided luggage.

U.S. Pat. No. 6,343,819 to S. Shiozaki (Feb. 5 2002) shows a security tag or seal of molded plastic material that is capable of being threaded through eyelets or holes then sealed; and carries a two part identification card bearing the same serial number on each part. One part is removed after the tag is applied and serves as a receipt or identification of ownership. While the device would be quite effective on soft-sided luggage it isn't applicable to hard-sided luggage. In addition, since it is made of molded plastic, it would be very costly; especially since adding the unique serial number to it would most likely require a secondary manufacturing operation.

A Patent Application U.S. 2002/0038744 AI filed Sep. 24, 2001 by I. Sukoff and published Apr. 4, 2002 also shows a device that appears to look like a standard cable tie with an attached "flag" to which some indication could be included. Here again, the device would only be applicable to soft-sided bags as there is no way it could be used to seal a hard-sided bag. Patent Applications U.S. 2003/0201893 AI filed Apr. 24, 2003 by L. Redburn and K. F. Florek (Published Oct. 30, 2003) and U.S. 2004/0164564 AI filed Feb. 17, 2004 (Published Aug. 26, 2004) reveal a Security Fastener and Method of Securing Luggage based on using an I.D. tag applied using a special fastening gun like apparatus to secure slide fasteners or zippers on soft-sided luggage. This device could be used by the Airlines if they were required by law to secure all luggage. However, its use by the general public would be cost prohibited, and it could not be used on hard-sided luggage.

U.S. Pat. No. 6,667,091 to E. De Lima Castro Netto (Dec. 23, 2003) shows a device which is very similar to standard cable tie in appearance and usage. It also has a unique feature to incorporate a strip of paper with unique indication. The paper is fed through the mold as the tie is being made using a special molding technique.

This device is only applicable to soft sided luggage and the manufacturing process requires the creation of the paper strip before molding the tie. As a result, the tie would not be inexpensive.

5 U.S. Pat. No. 6,694,655 to L. Redburn and K. F. Florek (Feb. 24, 2004) shows a cable tie type of device with an opening to receive a unique label for specific owner identification. While this item is applicable to any luggage employing slide fasteners, it can not be applied to any hard-sided luggage. A detailed examination of the patents listed above and many others, reveals that there are many solutions
10 to luggage tampering and detection; but none of the above solutions are currently being marketed to travelers. However, in looking through many travel related catalogs, one device was found specifically for passengers luggage. It is a plastic device called PrivaSeals which is sold through the Magellan Catalog. It has a plastic padlock shape with a thin locking member that one threads through the
15 holes in the zipper tabs on soft-sided bags and then forces it into a locking hole on the body of the seal. Each seal has unique number making it impossible to forge. However, this seal is only applicable to soft-sided bags and is not inexpensive. In addition, one would have to record the serial number of each seal to be sure that they were not replace by a tamper. To open the seal, one would have to cut the
20 thin locking member; which means the passenger would have to have the means to cut it. In a search of the Internet for tamper detection and protection devices being marketed by travel related companies several devices were found that specifically address the problem of airline luggage tampering. Some of the more significant ones are: Tamper seal (marketed through tamperseal.com), Magellan's
25 new Luggage Seal (which is based on the cable tie approach), Hellermannntyton Tyton Co's. Travel Ties (which are essentially colored standard cable ties), ITVV's Tamper Evident Luggage Seals (These too are essentially cable ties) and CCTV which makes a wide variety of cable tie like devices. All of these have one thing in common, they are only applicable to luggage using side fasteners or zippers; they
30 cannot be used with hard-sided bags and all require the passenger to record all the serial numbers (when they have them) to be sure that they haven't been replaced.

Another other item found on the Internet was a sealing tape marketed by CGM Security Solutions which is a special tape that could be used to secure boxes and hard-sided bags. When the tape was removed, a message appeared that said "Opened". Again, while this would work on hard-sided bags it would not be applicable for bags using side fasteners or zippers.

Also found on the Internet is a device called "Nanoseal" which is an electronic device which will record the each time a bag is opened, both the date and time of the day and the time of the intrusion. It is supposed to good for 1000 seals. However, an intrusion wouldn't necessarily be evident until you opened the bag; for it is placed in the bag and it has a very high price tag.

Another device being marketed specifically for hard-sided luggage with standard locks is a bag strap called "Flight-Tight" found in the Magellan Catalog. It essentially is plastic strap that is wrapped around the bag and is secured in such a manner that the strap must be cut to open the bag. Here, again the traveler is faced with carrying something "sharp" to cut the strap on arrival. The combination locks called "Travel Sentry", also found in the Magellan Catalog and elsewhere, have been certified by the TSA. These locks are designed to be opened by the TSA using a special key so the lock does not have to be cut if the TSA needs to inspect a bag's contents. Again, these locks are of no value on hard-sided luggage.

There are issues with the use of these types of tampering alerts and they also cannot provide a discrete method by which the owner can be alerted incognito.

The present invention aims to provide a method by which a device is able to alert them directly to their hand held device, such as an iPhone or iPad and computer either as a live alert of a stored event for them to view at a later time.

30

SUMMARY OF THE INVENTION

According to the present invention there is provided a device which can detect when two seal strips are parted and then sends a Bluetooth signal to a user to inform them that the case or container has been opened. Accordingly, it is a primary object of the present invention to provide a tamper-alert device for detecting opening and closing events of a secure case or container. The device includes a pair of magnetic adhesive strips or parts having a first portion connected to the area close to the edge of one opening side of a case or container. The second corresponding magnetic strip or part being opposite and close the first but located to the second opening side of the case. To the second strip or part is a small linked transmitter for Bluetooth.

When the case or container is opened the two magnetic strips or parts are separated and thus the magnetic field is broken, which is noted by the transmitter brain.

A microcontroller then permits the change in the connection of the magnetic strips to be sent as a Bluetooth signal to a hand held device within the vicinity.

The owner of the case or container is then sent an alert message to inform them that the case or container was opened at what time and for what period.

As these are based on self-adhesive strips with an integrally located processor and sender unit, the device may be used and applied to any situation where two opening surfaces would require monitoring. For example; if a laptop has sensitive information on it and is closed and sealed during transit or storage. The strips may be applied to the edge, as with the cases.

BRIEF DESCRIPTION OF FIGURES

Figures 1 show a case tamper alert device located inside a suitcase and transmitting to a hand held device;

Figures 2 show a close view of the opening of a case with the device located therein;

5 Figures 3 show a working flow table of the devices operative stages;

Figures 4 show the device located to the side of a flight case container;

Figures 5 show the device located to a brief case.

10

DETAILED DESCRIPTION OF FIGURES

A typical embodiment of the invention is illustrated in Figure 1 and comprise a device 1 which is self-adhesive and located inside a suitcase or other container 2.

15

The device 1 communicates remotely with the hand held device 3 via Bluetooth.

Figure 2 shows the device 1A self-adhesive strips which are magnetic and are placed opposite each other on each side of the two opening sections 5 and 6 of a suitcase or other container 2A.

20

Once the suitcase or other container 2A is opened, the sides 5 and 6 separate and the magnetic field is broken between 1A. This is noted by the processor and Bluetooth sender device 4, which is battery powered.

25

The processor and Bluetooth sender 4 then sends an alert message to the hand held device 3A, such as a smart phone or other suitable type with Bluetooth facilities built in.

30 On closure of the case the magnetic strips 1A re-join opposite each other and the magnetic switch resets and primes the system again.

The case is initially closed when the person packs or fills the case and the system is primed. The following stages are shown in Figure 3.

5 The case is closed and the magnetic strips and switch are primed. The case is then opened and the magnetic strips are separated and thus the magnetic switch is turned to the on position.

10 This enables the processor to be aware that the switch is now on and the processor then sends a message to the Bluetooth sender to forward an alert message to the device.

The user receives the message via their hand held device such as the smart phone or PC / tablet.

15 This alert may include additional information such as the time the case was opened, period of opening, for example.

20 The magnetic strip device may be applied to other locations around the rim of the case where the two opening edges meet, as shown in Figures 4 and 5.

This enables a user to have their luggage loaded onto an aircraft or other traveling means and check that the case was or was not opened without permission during the journey.

25 This information may of course be received and checked live or may be checked after the journey period, as the message from the device 1 and 4 will always be stored on their device.

I claim

1) A suitcase or briefcase tamper alert using Bluetooth wherein, a device is moreover derived as two self-adhesive strips which are magnetic, one of which is connected to a battery fed processor and Bluetooth sender unit, these are placed inside the chosen case near the edge of the two opening sections, so as the case is closed the two magnetic strips seat together and a magnetic field is formed which primes the device, as the case is opened the two magnetic strips separate which breaks the field and switches on the magnetic switch, this alerts the processor which informs the Bluetooth sender to forward a message to the user that the case has been opened or tampered with.

2) A suitcase or briefcase tamper alert using Bluetooth as claimed in claim 1 wherein magnetic self-adhesive strips form a switch when a case is closed.

3) A suitcase or briefcase tamper alert using Bluetooth as claimed in claim 2 wherein, when a case is opened magnetic strips separate and action a magnetic switch response which alerts a processor.

4) A suitcase or briefcase tamper alert using Bluetooth as claimed in claim 3 wherein, a processor is informed of a change by a magnetic switch which was triggered by a case opening and instructs a Bluetooth sender to which it is connected therein.

5) A suitcase or briefcase tamper alert using Bluetooth as claimed in claim 4 wherein, a magnetic switch instructs a Bluetooth sender within a case enclosure to send a message to a hand held device with an instruction that the case was opened at what time and for what period.

FIGURE 1

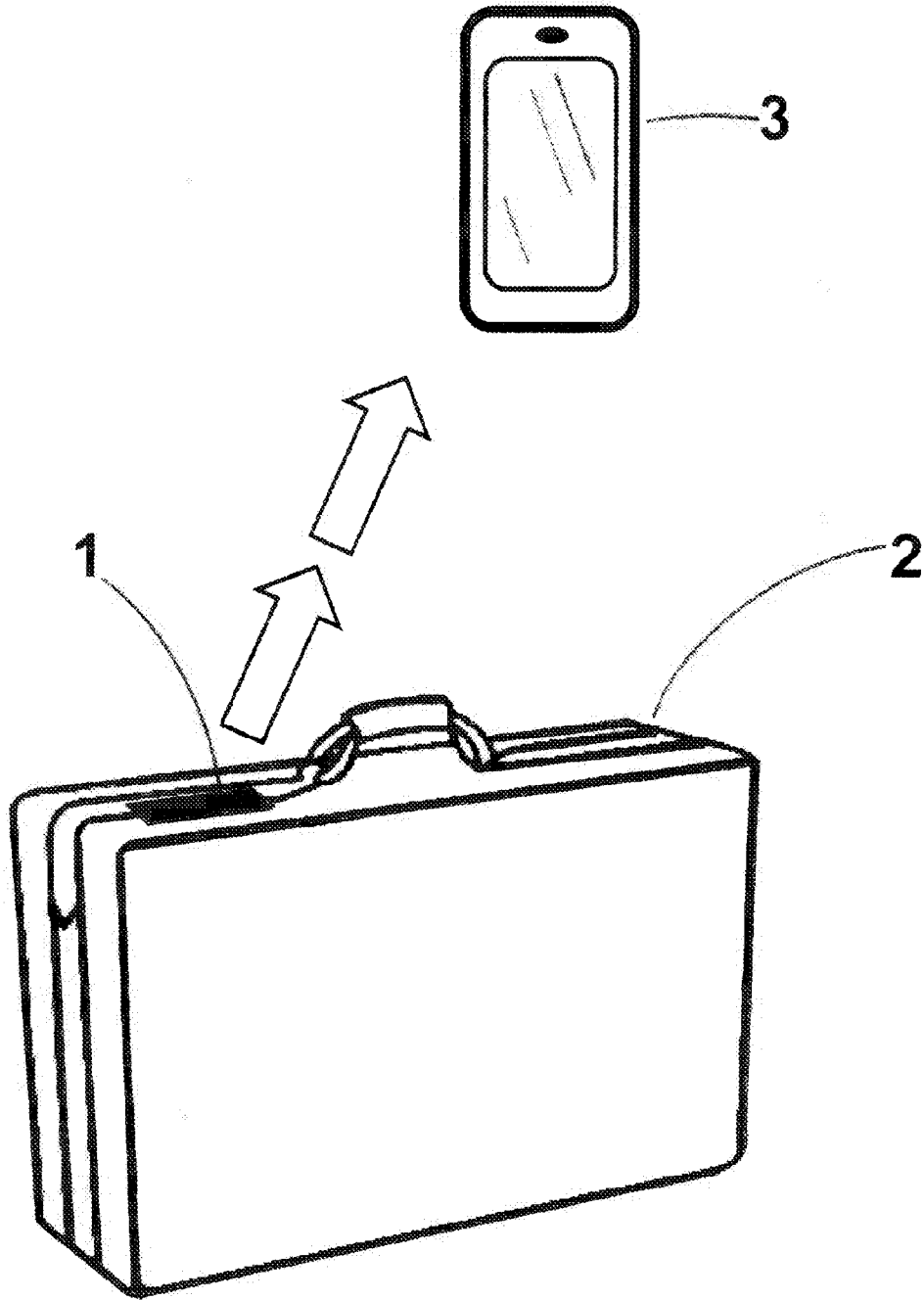


FIGURE 2

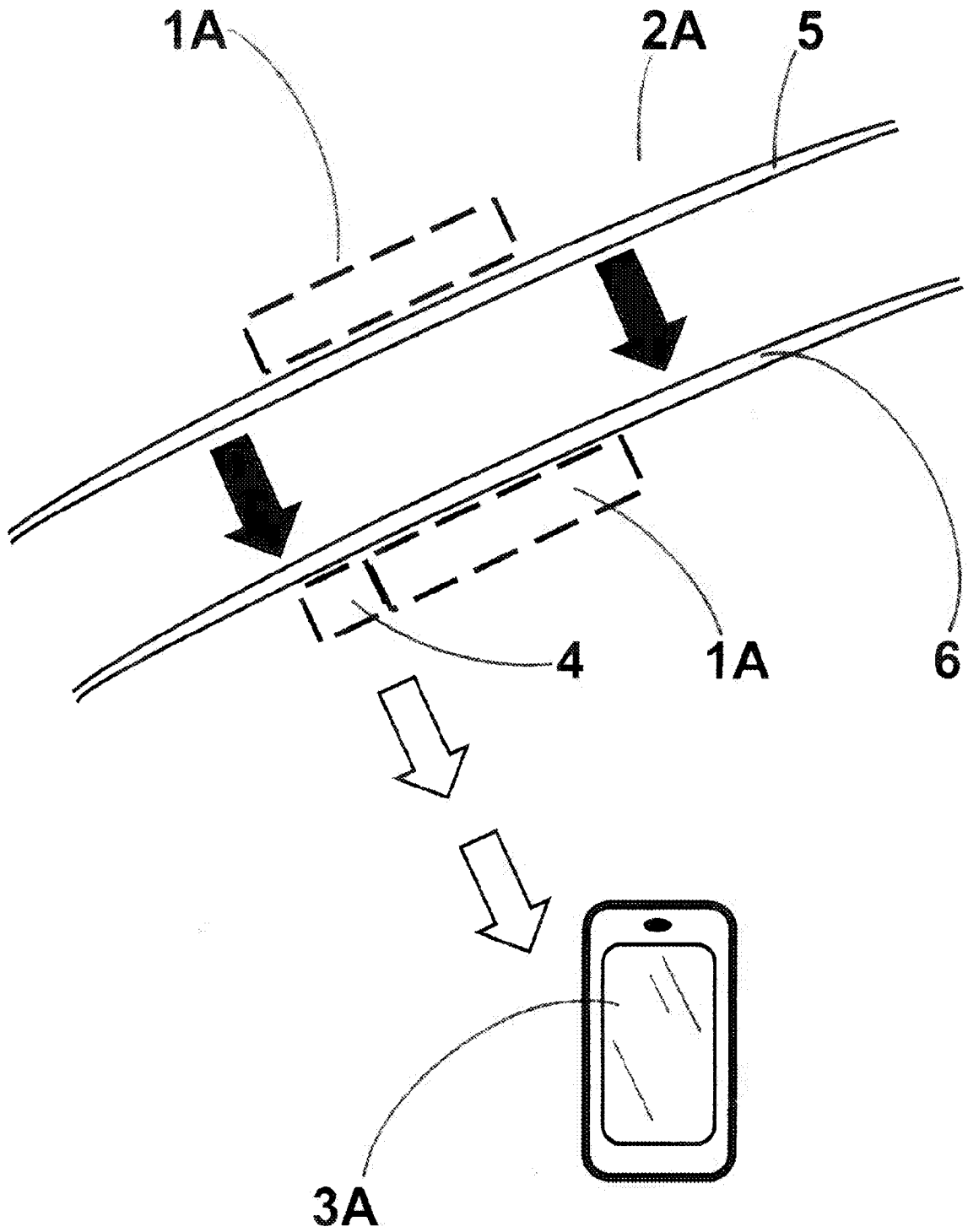


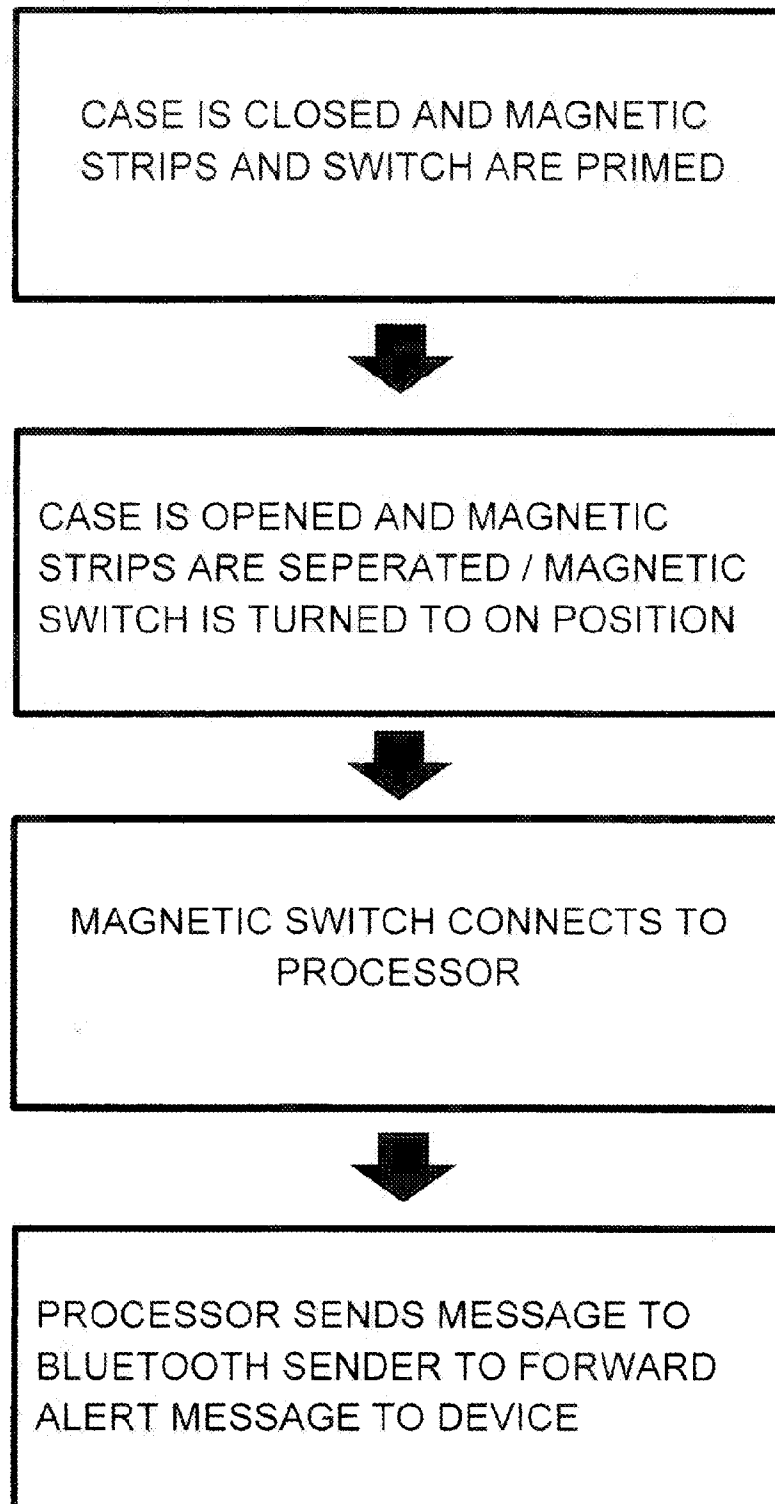
FIGURE 3

FIGURE 4

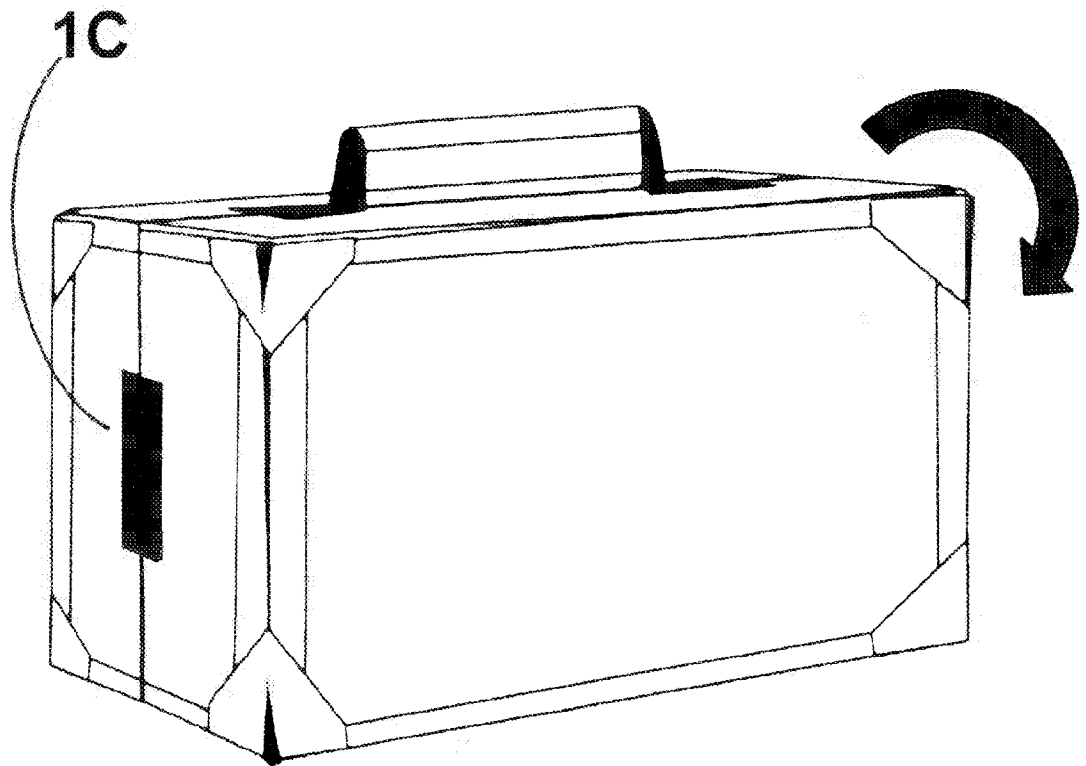
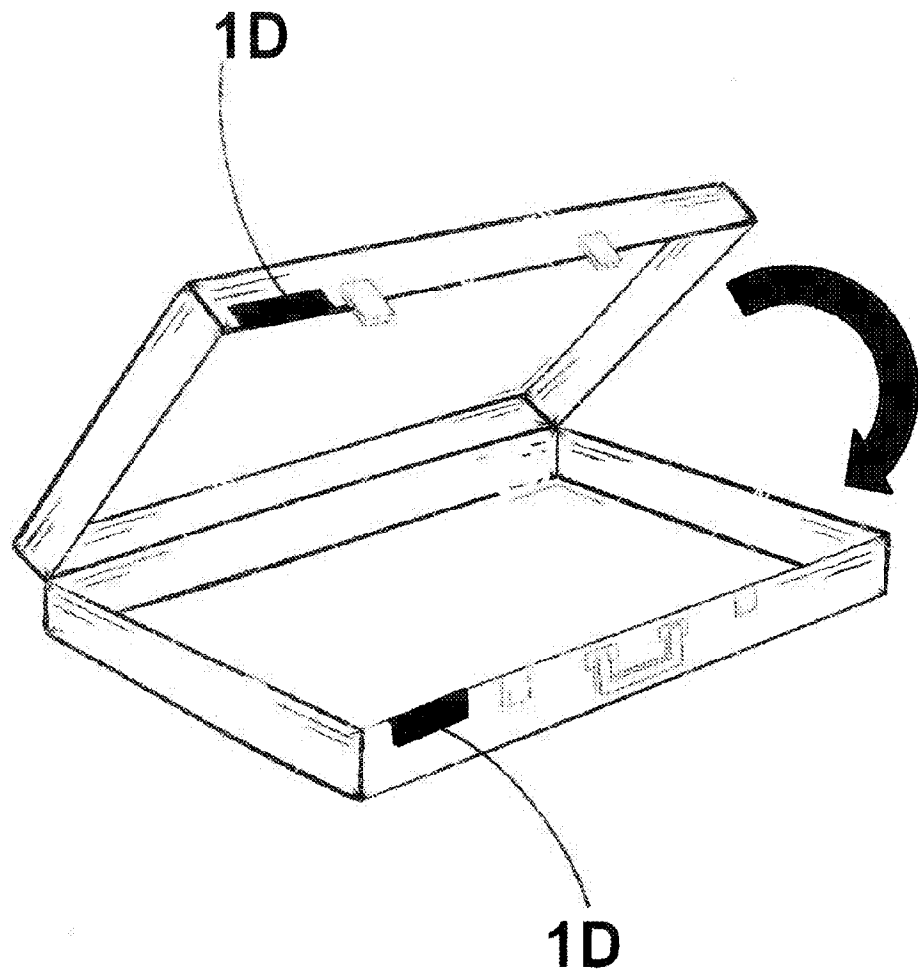


FIGURE 5



INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2017/050410

A. CLASSIFICATION OF SUBJECT MATTER
 INV. A45C13/18 G07C9/00 G08B13/06 G08B13/12 G08B13/24
 ADD.

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)
 A45C G07C G08B

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)
 EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
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| A | WO 99/57035 A1 (REDCLIFFE MAGTRONICS LIMITED [GB]; MILLARD RICHARD JAMES [GB]; JONES D) 11 November 1999 (1999-11-11) abstract; figure 2 | 1-5 |

Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents :

| | |
|---|---|
| <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> | <p>"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</p> <p>"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</p> <p>"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</p> <p>"&" document member of the same patent family</p> |
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| Date of the actual completion of the international search 25 April 2017 | Date of mailing of the international search report 04/05/2017 |
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| Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016 | Authorized officer Oliveras, Mariana |
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2017/050410

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
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