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**(54) ANTI-THEFT SYSTEM WITH MECHANIC AND ELECTRONIC PROTECTION**

**DIEBSTAHLSICHERUNGSSYSTEM MIT MECHANISCHEM UND ELEKTRONISCHEM SCHUTZ**  
**SYSTÈME ANTIVOL PERMETTANT UNE PROTECTION MÉCANIQUE ET ÉLECTRONIQUE**

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## Description

**[0001]** The present invention refers to an anti-theft system with mechanic and electronic protection.

**[0002]** Anti-theft devices are known in the art that are suitable to guarantee the protection of products to be exposed, allowing the potential customer to be able to see and try the products protected by them.

**[0003]** Some of these anti-theft devices, called "system with free touch", comprise a universal support, equipped with sensor, on whose surface the product to be exposed is fastened, through bi-adhesives. Vision of the product by a potential customer is made possible by the presence of a steel cable, that allows handling the product limiting it to the cable extension.

**[0004]** These devices however are not satisfactory, since they do not guarantee the complete and safe protection of the products from external tampering, the sensors present in such devices being adapted to be made useless through the use of thin instruments that can be easily inserted between sensor and product; moreover, these devices do not reduce the risk of false alarms, because fastening of the sensors, since they are not specific for the different types of product, can be cumbersome; finally, supply of the products to be protected occurs with a specific dedicated connection cable; therefore, it is necessary to arrange cables with variable lengths and sections, and often such supply is not enough to guarantee its use for the necessary time for evaluation and using the products being exposed by a potential customer.

**[0005]** GB-A-2 427 056, WO-A1-2004/038670, US-A-5 796 337 and US-A1-2011/254661 disclose anti-theft systems according to the preamble of Claim 1.

**[0006]** Object of the present invention is solving the above prior art problems, by providing an anti-theft system with various safety levels, that guarantees a total, electronic and mechanic protection, of the products being exposed from any unlawful tampering or intrusion, providing combinations of different levels of protection.

**[0007]** The above and other objects and advantages of the invention, as will appear from the following description, are obtained with an anti-theft system as claimed in the independent claim.

**[0008]** Preferred embodiments and non-trivial variations of the present invention are the subject matter of the dependent claims.

**[0009]** It is intended that all enclosed claims are an integral part of the present description.

**[0010]** The present invention will be better described by some preferred embodiments thereof, provided as a non-limiting example, with reference to the enclosed drawings, in which:

- Figure 1 is a perspective view of a preferred embodiment of the sensor- and product-carrier device of the anti-theft system according to the present invention;
- Figures 2-3 show a type of integration of the device

of Figure 1 on an exhibiting plane;

- Figures 4-5-6 show three different types of configuration of the sensor- and product-carrier device;
- Figure 7 shows an exploded perspective view of the main components of the device of the invention; and
- Figure 8 shows a schematic view of the anti-theft system of the present invention.

**[0011]** With reference to the Figures, a preferred embodiment of the anti-theft system of the present invention is shown and described. It will be immediately obvious that numerous variations and modifications (for example related to shape, sizes, arrangements and parts with equivalent functionality) can be made to what is described, without departing from the scope of the invention as appears from the enclosed claims.

**[0012]** With reference to the Figures, the anti-theft system for products (not shown) of the invention is substantially composed of:

- at least one sensor- and product-carrier device 100 adapted to mechanically protect a product and to transmit alarm signals in case of attempt of theft - detachment and separation from the support;
- at least one cable-winding element 300 adapted to receive the transmitted alarm signals;
- at least one cable 200, preferably made of steel, that connects the sensor- and product-carrier device 100 to the cable-winding element 300 and that is adapted to be unwound and wound in such element 300; and
- at least one external power supply 400 operatively connected to the cable-winding element 300.

**[0013]** In particular, the sensor- and product-carrier device 100 is composed of a support 1, made of hard plastic material, like PVC, PMMA, or other suitable material, equipped with a related universal fastening system, preferably composed of a through-adapted 17 and a fastening nut 18.

**[0014]** The system is further provided also in an external configuration, namely without its integration onto the exhibition plane. In this case, the system is inserted into a container (not shown). Such container can be rested onto the plane without drilling it, but only fastened with screws or simply with high-held bi-adhesive material. Batteries are accommodated in the container, sized in such a way as to guarantee the operation of the system also without main supply, that occurs through an external power supply. On the container base, there is a sensor that, in case of detachment of the container from the plane, will cause an optical-acoustic alarm. Such characteristic prevents stealing the product together with the support itself.

**[0015]** The support 1 is composed, in its upper part, of a sensor-carrier 2, preferably of a rectangular shape, on whose surface the product to be exposed is fastened, for example through bi-adhesives, main 4 and secondary 5 metallic jaws, DIN connection, and/or small nylon bands

(not shown).

**[0016]** Inside the sensor-carrier 2, a passive infrared (PIR) movement sensor 6 is placed, that is able to pick-up small movements and interferences due to the possible intrusion of sharp objects, between product and sensor 6. The above sensor 6 is integrated into a suitable electronic card, adequately fastened into the sensor-carrier 2 that has on its surface an hole 19, with suitable sizes, that allows the sensor to communicate with the exposed product. The sensor-carrier 2 has, in its lower part, a pin 7, cylindrical or having another suitable shape, equipped with electric contacts (not shown) operating in order to recharge the battery (not shown), integrated into the sensor-carrier 2 and aimed for supplying the sensor 6 itself. The support 1 further comprises, in its lower part, a shell 3, to which the sensor-carrier 2 is operatively connected, whose pin 7, equipped with electric contacts, is inserted into an housing cylinder 8, equipped with sliding contacts 13 and their related contact-holders 14, allowing to fasten the supply cable. Inside the housing cylinder 8 an upper ring 9 and a lower ring 10 are placed, both preferably made of copper, that guarantee, through a continuous contact with the sliding contacts 13, a supply to the device in any position in which the support 1 is placed into its shell 3. The above supply system, when the exposed product is not used, guarantees: - supply and recharge of the battery of the sensor 6 integrated into the sensor-carrier 2; - supply of the exposed product, by using an alarmed supply cable (not shown) equipped with connectors compatible with the micro-USB connector 11 of the sensor-carrier 2 and with the connector of the exposed product. The correct cable positioning is checked through an electronic transmission (TX) card 16 integrated into the sensor-carrier 2; if external movements are made in order to remove such constraint, tampering is signalled by activating an acoustic alarm, through a suitable acoustic and optical signalling device (not shown), through a suitable LED-type lighting signalling device 15; - a steel cable (not shown), that allows safely handling the product, limiting it to the cable extension. The above cable is fastened inside the pin 7 with a bush 12 and has an end connected through a screw-type connector (not shown) to the electronic card integrated into the sensor-carrier 2, and the other end fastened to the winding system (not shown) present in the shell 3, preventing dangerous cable entanglements when handling the product. The cable can be coated with PVC or other suitable material, to reduce rough contacts with delicate products; moreover, it provides the device with various types of protection:

- mechanical one, wherein the cable ensures a high resistance to possible tearing of the device, integral with the exposed product, from its fastening seat;
- electronic one, wherein the electronic transmission (TX) card 16, integrated into the sensor-carrier 2, transmits a signal along the steel cable. Such signal is collected by a coil (not shown); placed on the ca-

ble-winding element 300, connected to an electronic receiving (RX) card that decodes and guarantees, through a microprocessor, information contained in the signal, verifying steel cable efficiency and integrity;

- main 4 and secondary 5 metallic jaws are holding elements, preferably made of stainless steel, that slide inside the sensor-carrier 2, suitable to guarantee the mechanical protection of the exposed product adapting themselves to its shape and size, and making it integral with the device through a suitable fastening system; the ends of the above jaws can be coated with a rubbery material, to prevent scratching or damaging the exposed product. The jaws, once having been manually adhered against the exposed product sizes, are blocked, by acting on the fastening screw that is placed on the lower face of the sensor-support. The outline of the screw head is of the "proprietary" type and requires a specific tool that cannot be found on the market, useful arrangement in order to increase its safety. The correct positioning of the jaws 4, 5 is checked through the electronic transmission (TX) card 16 integrated in the sensor-carrier 2, as explained above;
- a pin-key (not shown) that allows deactivating the device, in its stand-alone configuration, following its tampering or failure, by inserting the above pin-key into the micro-USB connector 11 integrated into the sensor-carrier 2. The key is coded individually, and cannot be copied due to a special protection of the stored codes. The possible theft or loss of the key is not a problem, since it is possible to reset the system memory, thereby removing the stored content and avoiding improper uses of the lost or stolen key. Re-activation of the device is automatic and occurs when the product to be exposed is applied (is interfaced) onto the sensor surface, thereby activating the various safety levels (alarmed jaws, alarmed supply cable and/or small nylon bands, etc.).

**[0017]** The invention has the following advantages:

- \* it ensures a double, mechanic and electronic, protection, providing combinations of several levels of protection: alarmed and adjustable metallic jaws 4, 5, small nylon bands, alarmed supply cable, alarmed steel cable, movement sensor 6;
- \* it has a sensor 6, integrated into a suitable electronic transmission (TX) card 16, capable of picking-up small movements and interferences due to the possible intrusion of sharpened objects between exposed product and sensor 6; moreover, it has such features that, in case of sudden exposures to light beams, prevent saturation and inhibition (disabling) of the sensor 6 and reduce to a minimum the interference of possible electric fields being present. Finally, the above sensor 6 is equipped with a filter that prevents the intrusion of dust and/or insects that

could obscure the field of view of the sensor, generating false alarms;

\* it guarantees for the potential customer a complete and prolonged vision and use of the product exposed onto the device, since the product supply is not provided by a specific conductor of the product itself, but by an alarmed supply system inside the device. The exposed product will always be charged, protected and ready to use;

\* it allows a better visibility of the product and its functional and aesthetic features, since the protecting device is scarcely invasive on the product; it follows a reduction both of the time dedicated by the sales responsables to the customer, and of the wait times for the customer himself, that can on his own and exhaustively evaluate the product features.

**[0018]** Herein below a further summary of the anti-theft system of the invention will be given.

**[0019]** This is an anti-theft system that allows exposing products to allow their testing by customers. It provides supply, but above all prevents removals. The non-authorized detachment of the product from the support in fact generates an optical-acoustic alarm. The anti-theft protection is of the electronic and mechanic types. The protection levels can be present in the sensor 6 individually or as multiple. The mechanical protection instead is guaranteed by the fact that the sensor 6 is constrained by the small steel cable 200 coated with PVC. The possible cutting of the cable is possible only with suitable instruments, such as cutting nippers or shears.

**[0020]** Apart that an alarm is generated in case of cutting, such cable 200 guarantees a tearing resistance equal to 130 kg. The small cable 200 is collected inside a cable-winding mechanism 300 with reduced sizes.

**[0021]** The sensor- and product-carrier device 100 is preferably a part made of plastic material with a plane side on which the product to be exhibited / supplied / protected is rested.

#### Exhibition function:

**[0022]** It is the simplest one and is essentially due to the fact that a support is available, on which the product to be exposed is fastened. The sensor-support 100 is integrated onto a shelf or piece of furniture (Figures 2 and 3), using a set of brackets and accessories that allow its fastening onto any type of material: glass, wood, plastic fibres and plexiglass. The support can be lifted and is constrained onto the base through the steel cable. This allows an handling that is always limited to the cable extension. In any case, the sensor-support 100 is placed again into its seat after every handling, thereby avoiding an unorderly display.

#### Anti-theft protection function:

**[0023]** The product is constrained and/or protected with the modes described below. Such means can be present individually or as multiples.

**[0024]** The important features of this sensor is ensuring a mechanic and electronic protection that are mutually combined. The high-level mechanic protection is given by the stainless steel jaws 4, 5. Such jaws 4, 5 are adjustable to be suited to the different formats of the products to be protected but, above all, are equipped with an electronic alarm to avoid undesired openings. The electronic protection, in addition to the one integrated in the jaws 4, 5, is given by the presence of the high-safety sensor 6 that "sees" the presence of the product rested onto the sensor-support 100. Moreover, it is possible to have a further alarm signalling due to an electronic contact that is closed when the supply cable is inserted into the product. Upon its detachment, an alarm is triggered.

**[0025]** Individually, the sensor features are:

- small nylon band that is tightened around the product, keeping it against the support. The small band is a common nylon wire equipped at one end with a small ball obtained by heat-melting. Once having inserted it into the support till the small ball is blocked into its suitable seat, the small band must be applied around the product, enters into the support and is blocked by the action of two wheels.
- metallic jaws 4, 5: they are holding elements made of steel that slide inside the support. They are shaped as a C and are tightened onto the sides of the product, making it integral with the support. Once tightened, it is enough to tighten the locking screw integrated into the support to prevent them from being enlarged. The locking screw works on a printed circuit, made in order to simulate a switch and, due to the presence of a washer made of phosphor bronze coupled with the screw thread, the contact is closed only when the screw is well tightened, and is opened when this latter one is loosened. The jaws 4, 5 are provided in different sizes and shapes to be suited for protecting various types and sizes of products (cellular phones, Smartphones, Tablets, GPS, MP3, videogames, etc.). The end in contact with the products is coated with rubbery material to prevent from scratching or damaging the product.
- PIR sensor 6: it is a sensor that is able to pick-up movements or insertion - between sensor and applied object - of tools like blades or cards that instead are capable of disabling the traditional micro-switches that are normally used for this purpose. The sensor, integrated onto the electronic card contained in the device 100, communicates with the outside through an hole 19. A bi-adhesive, suitably drilled next to the small window of the PIR sensor 6, allows

the product to be kept adhered to the support surface.

- supply connector; the sensor 6 is capable of providing a supply to exposed apparatus. Starting from this element together with the connector contacts to which the device supplying cable must be connected, safety connections have been inserted. In practice, if the supply cable is disconnected from the support 1 or the product, the sensor 6 signals an alarm.

**[0026]** Depending on what is expressed, it is possible to have the following protection levels active on the product-carrier sensor.

- a) Alarmed supply cable
- b) PIR sensor 6
- c) Alarmed jaws 4, 5
- d) Alarmed small nylon band
- e) Alarmed supply cable + PIR sensor 6
- f) Alarmed supply cable + PIR sensor 6 + alarmed jaws 4, 5
- g) PIR sensor 6 + alarmed jaws 4, 5
- h) PIR sensor 6 + alarmed small nylon band
- i) PIR sensor 6 + alarmed supply cable
- j) PIR sensor 6 + alarmed supply cable + alarmed jaws 4, 5
- k) Alarmed small nylon band + alarmed supply cable
- l) Alarmed jaws 4, 5 + alarmed supply cable

**[0027]** The only combination that is not possible to perform is the simultaneous presence of alarmed jaws 4, 5 and alarmed small nylon band.

**[0028]** There is then a sensor version aimed for protecting photo/video-cameras and reflex apparatus. Also in this case there is a double safety.

**[0029]** The upper part of the sensor houses a screw that is inserted in the connection that, in every apparatus, is aimed to fasten the tripod. This connection is of the DIN-type, and therefore there are no compatibility problems. The locking screw works on a printed circuit made in order to simulate a switch and, due to the presence of a washer made of phosphor bronze coupled with the screw thread, the contact is closed only when the screw is well tightened and is opened when the latter one is loosened. Also in this case the profile of the screw head is "proprietary" as above. It is also provided to have the

functionality of alarmed small nylon band. In fact, it can be important to surround the photographic apparatus with the small nylon band, thereby obtaining a second safety. This small band makes it impossible to rotate the apparatus if somebody tries to detach it by rotating it. In fact, the small band also prevents the rotation, voluntary or not, of the apparatus on the support without loosening or cutting it. In case of reflex apparatus, the small nylon band can be wound around the objective, extending the protection also to this component. In fact, it will be enough to unscrew the optics in order to loosen the band tension and generate an alarm. The protection is thereby discrete, since the wire has a diameter of mm 1.2 that totally copies the rounded shape of the optics. This aspect makes it free from false alarms occurring in adhesive sensors that are normally used for this purpose. This advantage is essentially due to two reasons:

1- the normally-used sensor is a micro-switch applied onto the product through a bi-adhesive. Since optics and objectives are round, the contact surface between bi-adhesive and product is very small and a great part of the bi-adhesive does not touch the product. This causes a rather scarce fastening that can be easily detached, even partially, but enough to trigger the micro-contact.

2- The customer moves the focusing and the sensors attached above are subjected to quite a high mechanic action, and often this has no particular care for "foreign bodies" applied onto the objects being handled.

**[0030]** In the sensor-carrier device 2 an electronic card is integrated, on which the components performing the various functions are assembled. The sensor-support is connected to the "base" through a steel cable. Such cable, due to its construction and nature, is not able to transport supplies or other signals. Therefore, a supply had to be provided to allow such card to operate. In the sensor-support a rechargeable Li-Po battery is integrated. This battery is aimed to supply all electronic components placed in the sensor-support. The battery is recharged according to the modes described below. Particular care regarding various consumptions, absorptions and dispersions has allowed having a high-level operation also in battery mode. The performed tests ensure a 7-day autonomy.

#### Supply function:

**[0031]** The products exposed and fastened onto the device 100 must be supplied in order to operate and efficiently demonstrate their own features to a potential customer.

**[0032]** The sensor-support 100 is equipped with a connector to insert a small cable equipped with a compatible connector with the one as equipment for the exposed

product. Such cable has, in addition to the supply function, also the alarm function in case of detachment.

**[0033]** Moreover, the products to be supplied can require voltage and current values that are rather different one from the other. In particular, with the always increasing popularity of tablets and smart-phones, the availability of high amperages is required, even near the 2 Ah value. It is therefore easily understandable that, transporting these values through a cable with copper conductors coming from the central unit that is not immediately nearby the sensors, means having cables with adequate sections; anyway, there are well defined limits connected to the maximum possible length and the risk of short-circuits and miscellaneous interruptions. For this reason, it has been avoided to transport the supply through the connection cable, and a different method has been applied. Given that the product exposed in a shop remains for the majority of time abutted onto its bearing surface, such assumption taking into account the night hours in which the shop is closed and all the time (the majority) in which the product is not handled by customers, it can be easily concluded that such time is well enough to recharge the product battery. It is commonly known to recharge our cellular phones during the night, and this is enough for a long use - even the whole day. For this reason, supply has been transported through contacts that have continuity only when the sensor-support is inserted in its own support. This occurs also due to the presence of two contacts (positive and negative) in the small glass housing the cylindrical part of the sensor-support 100. Such contacts are placed in order to get in contact with two circular contacts integrated on the cylindrical "foot" of the sensor-support 100. In this way, supply is transported directly from the power supply and, passing through these contacts, it is transferred into the sensor-support 100 and, through the connector responsible for the connection of the flexible cable, it can supply the product and recharge its battery. In this way, there are no more side effects, such as cable section, conductors that can break, limits due to conductor resistivity and, above all, risks of short-circuits.

**[0034]** Going back to the electronic protection of the steel cable and the data transmission to the RX card, it must be noted that this result is obtained by inducing a frequency in the cable. Such frequency is produced by a transmitter integrated in the sensor-support 100: this frequency is sent to a receiver through the cable 200. As already described, such transmitter is supplied through power supply when the sensor-support 100 is at rest and is inserted into its seat; when instead the product is lifted by potential customers, the supply provided by the Li-Po battery, that has been recharged during the whole "resting" time, starts working. The autonomy without charge is over 7 days. The cable transports the frequency and nothing more, since its end is fastened into the rotating element of the cable-winding device only to guarantee the adequate mechanical holding and prevent the cable 200 from being easily detached from the fastening base

3. On one side of the cable-winding device case, an antenna of the coil type is fastened, that, in turn, is connected to an electronic card that has the function of receiver of the above frequency, in addition to all the components to product an optical and acoustic alarm. Everything is based on the fact that the frequency emitted by the TX is always received by the RX card. When this does not occur, this means that the cable 200 has been cut or the connector unscrewed. Obviously, on this card there is a connector for the power supply, as well as adequate back-up batteries to guarantee the operation also in case of black-out or supply sabotage. Obviously, this card receives all other signals related to "safeties" present on the TX (sensor-support), namely alarms due to the opening of the alarmed jaws, the detachment of the product from the support (presence sensor) and the detachment of the alarmed supply cable.

**[0035]** In order to manage the system, some accessories are provided.

#### Turning-off key

**[0036]** The system is of the stand-alone type: this means that it is able to operate individually, without being connected to other apparatus. The system activation is automatic and occurs when the product is applied onto the sensor-support 100 and the various safeties are "closed", being the alarmed jaws 4, 5, the small nylon band or the alarmed supply cable. After this, the system is active. In case of alarm caused by a theft attempt, the system produces an acoustic alarm from a buzzer present on the RX card integrated on the cable-winding element 300, and an optical alarm through highly luminous LEDs placed in the support seat. In order to deactivate it, it is necessary to use a specific key with non-repeatable coding. Such key is similar to a micro-USB pin and must be inserted into the micro-USB connector present in the sensor-support 100. This operation generates a code that, once recognised by the managing software, turns the alarm off and places the system in stand-by. It will remain as such till a new product will again be placed on the sensor-support 100.

#### Alarmed jaws-opening key

**[0037]** It is a key shaped as a steel tube characterised by a particular outline, that anyway cannot be found among the tools on the market. This key must be inserted into the housing present in the rear part of the sensor-support 100, and is used to tighten or loosen the screw that blocks the movement of the alarmed jaws. It is a simple and quick operation.

#### **Claims**

1. Anti-theft system with mechanic and electronic protection of products, composed of:

- at least one sensor- and product-carrier device (100) adapted to mechanically protect a product and to transmit alarm signals in case of attempt of theft;
- at least one cable-winding element (300) adapted to receive the transmitted alarm signals;
- at least one cable (200), preferably made of steel, that connects said sensor- and product-carrier device (100) to said cable-winding element (300) and that is adapted to be unwound and wound in such element (300); and
- at least one external power supply (400) operatively connected to said cable-winding element (300);

said sensor- and product-carrier device (100) comprising:

- at least one support (1);
- means (4, 5) for mechanically holding the product; and
- means (17, 18) for connecting to external supports;

said at least one support (1) being composed of:

- a sensor-carrier (2);
- a movement sensor (6) contained inside said sensor-carrier (2); and
- an alarmed supply cable;

**characterised in that** said sensor- and product-carrier device (100) is further equipped with at least one supply system adapted to guarantee, when the exposed product is not used, both the supply of the sensor (6) battery integrated in the sensor-carrier (2), and the supply of the exposed product, by using the alarmed supply cable, said supply system being made so that a pin (7) of the sensor-carrier (2), equipped with electric contacts, is inserted into a housing cylinder (8) of the shell (3) of the device (100), said cylinder (8) being equipped with sliding contacts (13) and related contact-holders (14), inside said housing cylinder (8) being placed an upper ring (9) and a lower ring (10), adapted to guarantee, through a continuous contact with said sliding contacts (13), a supply of the device (100) in any position in which the support (1) is placed in its shell (3).

2. System according to claim 1, **characterised in that** said means (4, 5) for mechanically holding the product are composed of bi-adhesive supports or small nylon bands.
3. System according to claim 1, **characterised in that** said means (4, 5) for mechanically holding the product are composed of at least one main metallic jaw

(4) and at least one secondary metallic jaw (5).

4. System according to claim 1, **characterised in that** it further comprises at least one pin-type key adapted to restore the device (100), in a stand-alone configuration, after tampering or failure, by inserting said pin-type key into a micro-USB connector (11) integrated in the sensor-carrier (2), a reactivation of the device (100) being then automatic and occurring when the product to be exposed is interfaced on the sensor surface, activating the various safety levels.
5. System according to claim 1, **characterised in that** said supply cable is equipped with connectors compatible with the micro-USB connector (11) of the sensor-carrier (2) and with the connector of the exposed product, and is adapted to guarantee the operation of the supply system, through a correct positioning of said cable, that can be verified through the electronic transmission TX card (16) integrated in the sensor-carrier (2).

#### Patentansprüche

1. Mechanisches und elektronisches Diebstahlschutzsystem für Produkte, bestehend aus:

- mindestens einem Sensor- und Produkthalter (100), der dazu dient, ein Produkt mechanisch zu schützen und Alarmsignale bei Aufbruchversuchen zu senden;
- mindestens einem Kabelaufrollelement (300), das dazu dient, die gesendeten Alarmsignale zu empfangen;
- mindestens einem Kabel (200), vorzugsweise aus Stahl, das den genannten Sensor- und Produkthalter (100) mit dem genannten Kabelaufrollelement (300) verbindet und dazu dient, sich in diesem Element (300) auf- und abzurollen; und
- mindestens einem externen Netzteil (400), das operativ mit dem genannten Kabelaufrollsystem (300) verbunden ist;

Der genannte Sensor- und Produkthalter (100) schließt Folgendes ein:

- mindestens eine Halterung (1);
- mechanische Rückhaltemittel (4, 5) des Produkts; und
- Verbindungsmittel (17, 18) mit externen Stützvorrichtungen.

Die genannte mindestens eine Halterung (1) besteht aus:

- einem Sensorhalter (2);

- einem Bewegungssensor (6), der im genannten Sensorhalter (2) enthalten ist; und
- einem Stromkabel mit Alarmanlage;

und ist **dadurch gekennzeichnet**, dass der genannte Sensor- und Produkthalter (100) außerdem mit mindestens einem Stromversorgungssystem ausgestattet ist, das dazu dient, während der Nicht-nutzungsphase des ausgestellten Produkts sowohl die Stromversorgung der Batterie des Sensors (6), die im Sensorhalter (2) integriert ist, als auch die Stromversorgung des ausgestellten Produkts durch die Verwendung des Stromkabels mit Alarmanlage zu garantieren, das genannte Stromversorgungssystem ist so ausgeführt, dass sich der Bolzen (7) des Sensorhalters (2), der mit elektrischen Kontakten ausgestattet ist, in einen Aufnahmezylinder (8) der Hülle (3) der Vorrichtung (100) einsetzt, der genannte Zylinder (8) ist mit Gleitkontakten (13) und entsprechenden Kontakthaltern (14) ausgestattet, im genannten Aufnahmezylinder (8) sind ein oberer Ring (9) und ein unterer Ring (10) positioniert, die dazu dienen, durch einen Dauerkontakt mit den genannten Gleitkontakten (13) eine Stromversorgung der Vorrichtung (100) in jeder beliebigen Position zu garantieren, in der die Halterung (1) in ihrer Hülle (3) untergebracht wird.

2. System gemäß Patentanspruch 1, das **dadurch gekennzeichnet ist**, dass die genannten mechanischen Rückhaltemittel (4, 5) des Produkts aus beidseitig klebenden Halterungen oder Nylonbändern bestehen.
3. System gemäß Patentanspruch 1, das **dadurch gekennzeichnet ist**, dass die genannten mechanischen Rückhaltemittel (4, 5) des Produkts aus mindestens einer Hauptspannbacke aus Metall (4) und aus mindestens einer sekundären Spannbacke aus Metall (5) bestehen.
4. System gemäß Patentanspruch 1, das **dadurch gekennzeichnet ist**, dass es außerdem einen Stiftschlüssel enthält, der dazu dient, die Rückstellung der Vorrichtung (100) in der Stand-alone-Konfiguration infolge einer Sabotage oder eines Defekts durch die Einführung des o. g. Stiftschlüssels in einen Mikro-USB-Verbinder (11) garantieren kann, der im Sensorhalter (2) integriert ist, die Neuaktivierung der Vorrichtung (100) ist daher automatisch und erfolgt, wenn das auszustellende Produkt mit der Sensoroberfläche verbunden wird, indem die verschiedenen Sicherheitsniveaus aktiviert werden.
5. System gemäß Patentanspruch 1, das **dadurch gekennzeichnet ist**, dass das genannte Stromkabel mit Verbindern ausgestattet ist, die mit dem Mikro-USB-Verbinder (11) des Sensorhalters (2) und mit

dem Verbinder des ausgestellten Produkts kompatibel sind, und dass es dazu dient, die Funktionsweise des Stromversorgungssystems durch eine korrekte Positionierung des genannten Kabels zu garantieren, die durch die elektronische Steuerkarte (16) der im Sensorhalter (2) integrierten TX-Übertragung geprüft werden kann.

## 10 Revendications

1. Système antivol, à protection mécanique et électronique des produits, composé de :

- au moins un dispositif porte-capteur et porte-produit (100) en mesure de protéger mécaniquement un produit et de transmettre des signaux d'alarme en cas de tentative d'effraction ;
- au moins un élément enrouleur de câble (300) apte à recevoir les signaux d'alarme émis ;
- au moins un câble (200), de préférence en acier, qui relie ce dispositif porte-capteur et porte-produit (100) à l'élément enrouleur de câble (300) et qui est en mesure de se dérouler et de s'enrouler sur cet élément (300) ; et
- au moins un alimentateur externe (400) relié opérationnellement à l'élément enrouleur de câble (300) ;

le dispositif porte-capteur et porte-produit (100) comprend :

- au moins un support (1) ;
- des moyens (4, 5) de tenue mécanique du produit ; et
- des moyens (17, 18) de raccord aux soutiens externes.

le support (1) est composé de :

- un porte-capteur (2) ;
- un capteur de mouvement (6) situé à l'intérieur du porte-capteur (2) ; et
- un câble d'alimentation relié à une alarme ;

**caractérisé en ce que** le dispositif porte-capteur et porte-produit (100) est doté en outre d'un système d'alimentation en mesure de garantir, pendant la phase de non utilisation du produit exposé, aussi bien l'alimentation de la batterie du capteur (6), qui est intégrée dans le porte-capteur (2), que l'alimentation du produit exposé, à travers l'utilisation du câble d'alimentation relié à une alarme ; ce système d'alimentation est réalisé de sorte que la goupille (7) du porte-capteur (2), dotée de contacts électriques, entre dans le cylindre d'accueil (8) du boîtier (3) du dispositif (100) ; le cylindre (8) est doté de contacts à frottement (13) et de porte-contacts (14) ; à l'inté-



rieur du cylindre d'accueil (8) se trouvent une bague supérieure (9) et une bague inférieure (10) qui garantissent, à travers le contact permanent avec les contacts à frottement (13), l'alimentation du dispositif (100) quelle que soit la position du support (1) dans son boîtier (3). 5

2. Système, selon la revendication 1, **caractérisé en ce que** les moyens (4, 5) de tenue mécanique du produit sont composés de supports adhésifs double face ou de lacets en nylon. 10
3. Système, selon la revendication 1, **caractérisé en ce que** les moyens (4, 5) de tenue mécanique du produit sont composés au moins d'une mâchoire métallique principale (4) et au moins d'une mâchoire métallique secondaire (5). 15
4. Système, selon la revendication 1, **caractérisé en ce qu'il** comprend en outre au moins une clé/fiche apte à garantir le rétablissement du dispositif (100), en configuration autonome, après une altération ou une panne, en introduisant la clé/fiche dans un connecteur micro-USB (11) intégré dans le porte-capteur (2) ; le réamorçage du dispositif (100) est automatique, il se vérifie quand le produit à exposer s'interface sur la surface du capteur, ce qui active les différents niveaux de sécurité. 20 25
5. Système, selon la revendication 1, **caractérisé en ce que** le câble d'alimentation, qui est doté de connecteurs compatibles avec le connecteur micro-USB (11) du porte-capteur (2) et avec le connecteur du produit exposé, est apte à garantir le fonctionnement du système d'alimentation à travers un positionnement correct du câble, qui peut être vérifié à l'aide de la carte électronique (16) de transmission TX intégrée dans le porte-capteur (2). 30 35

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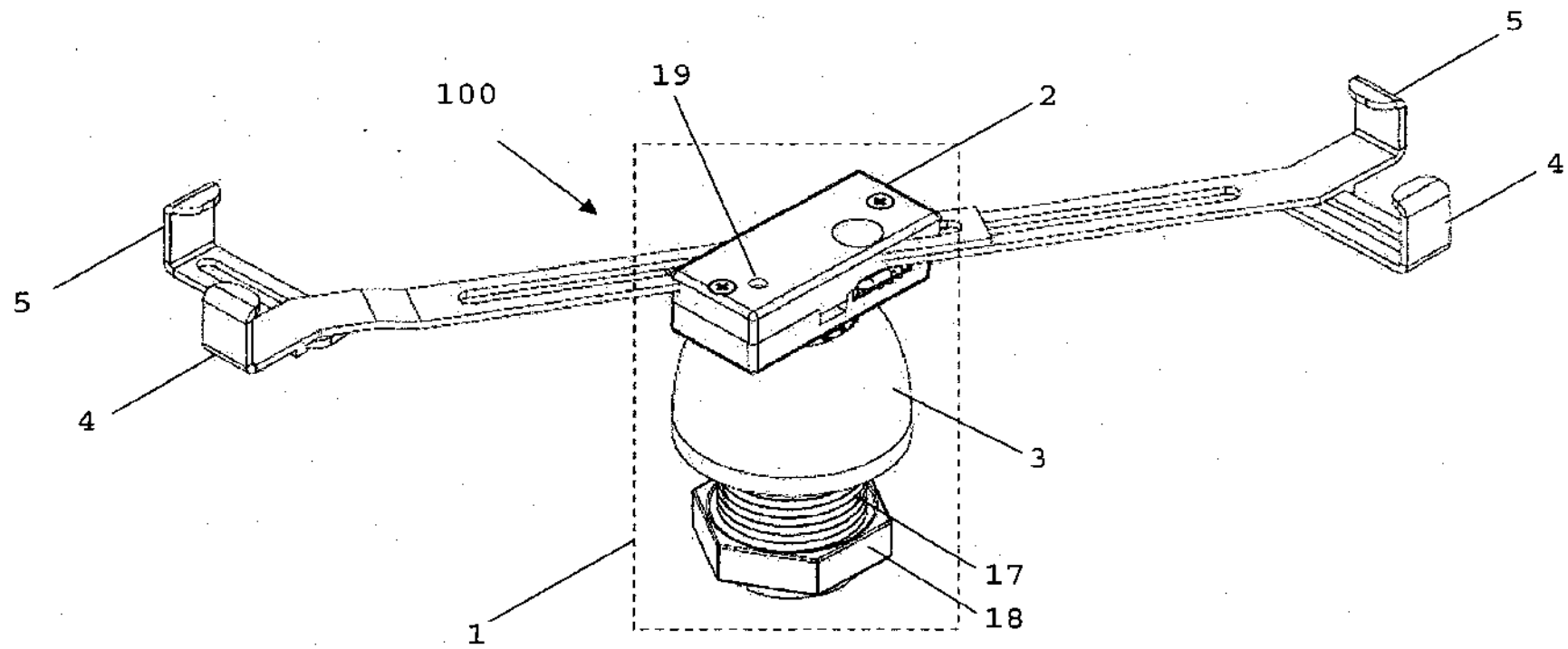


FIG. 1

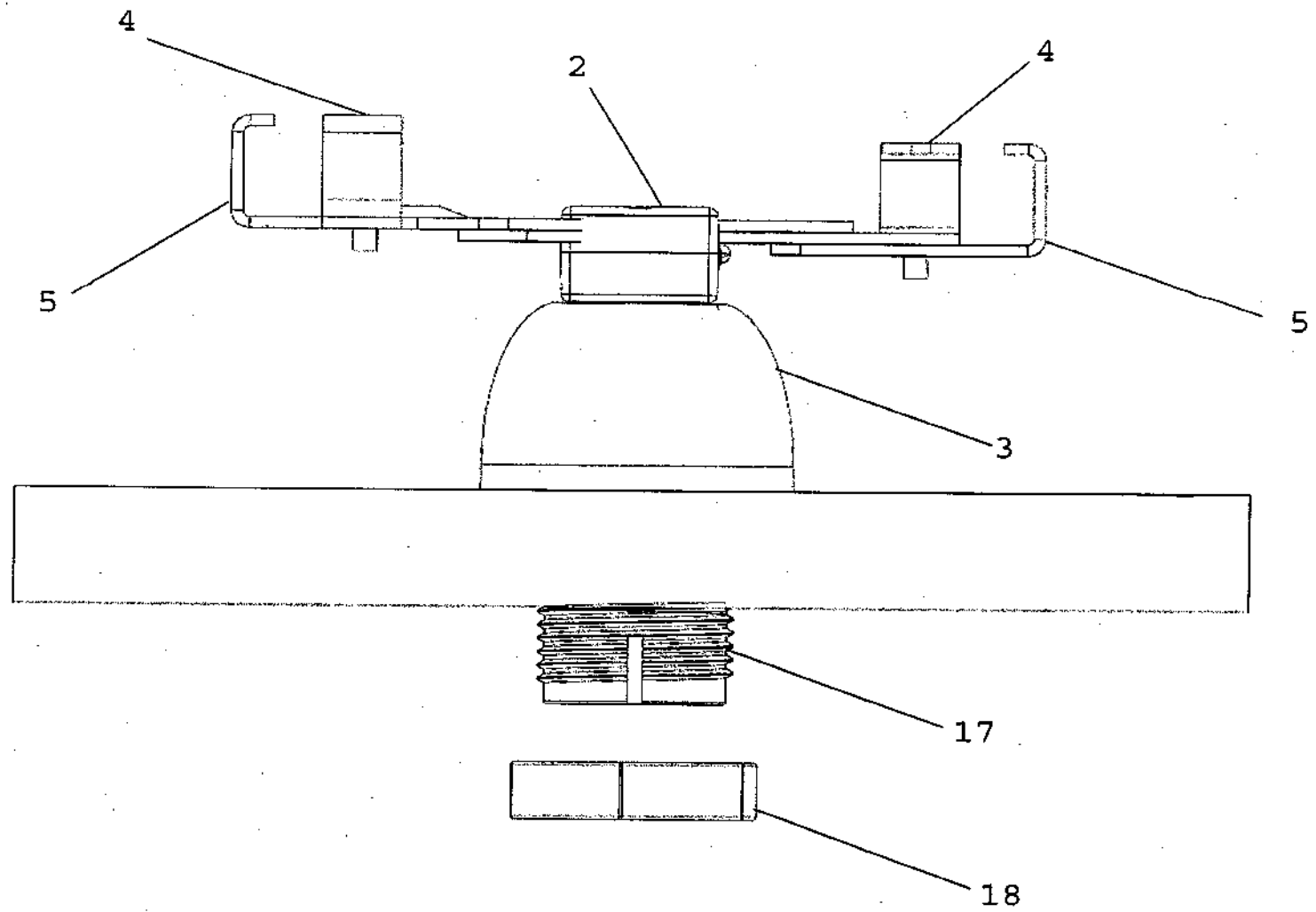


FIG. 2

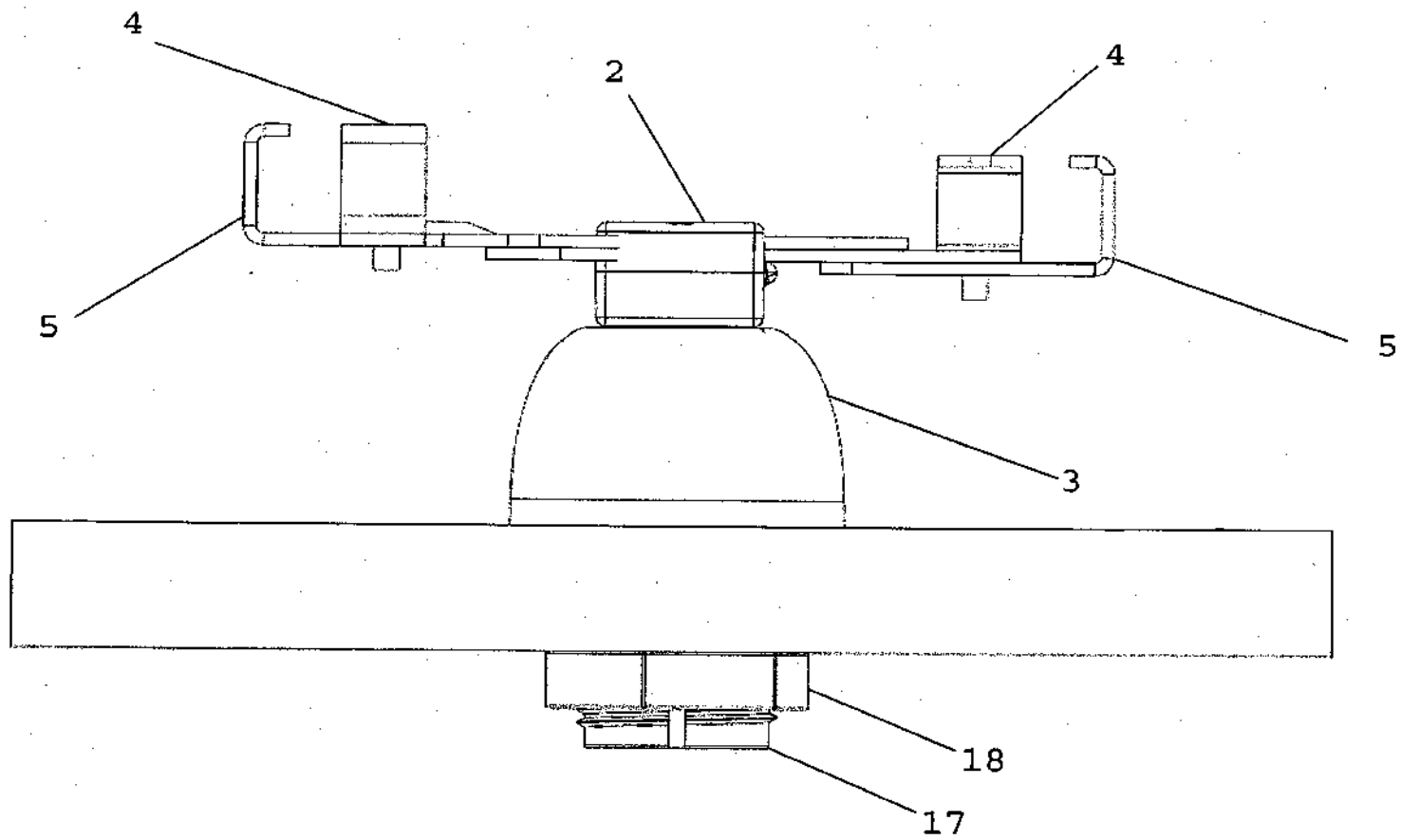


FIG. 3

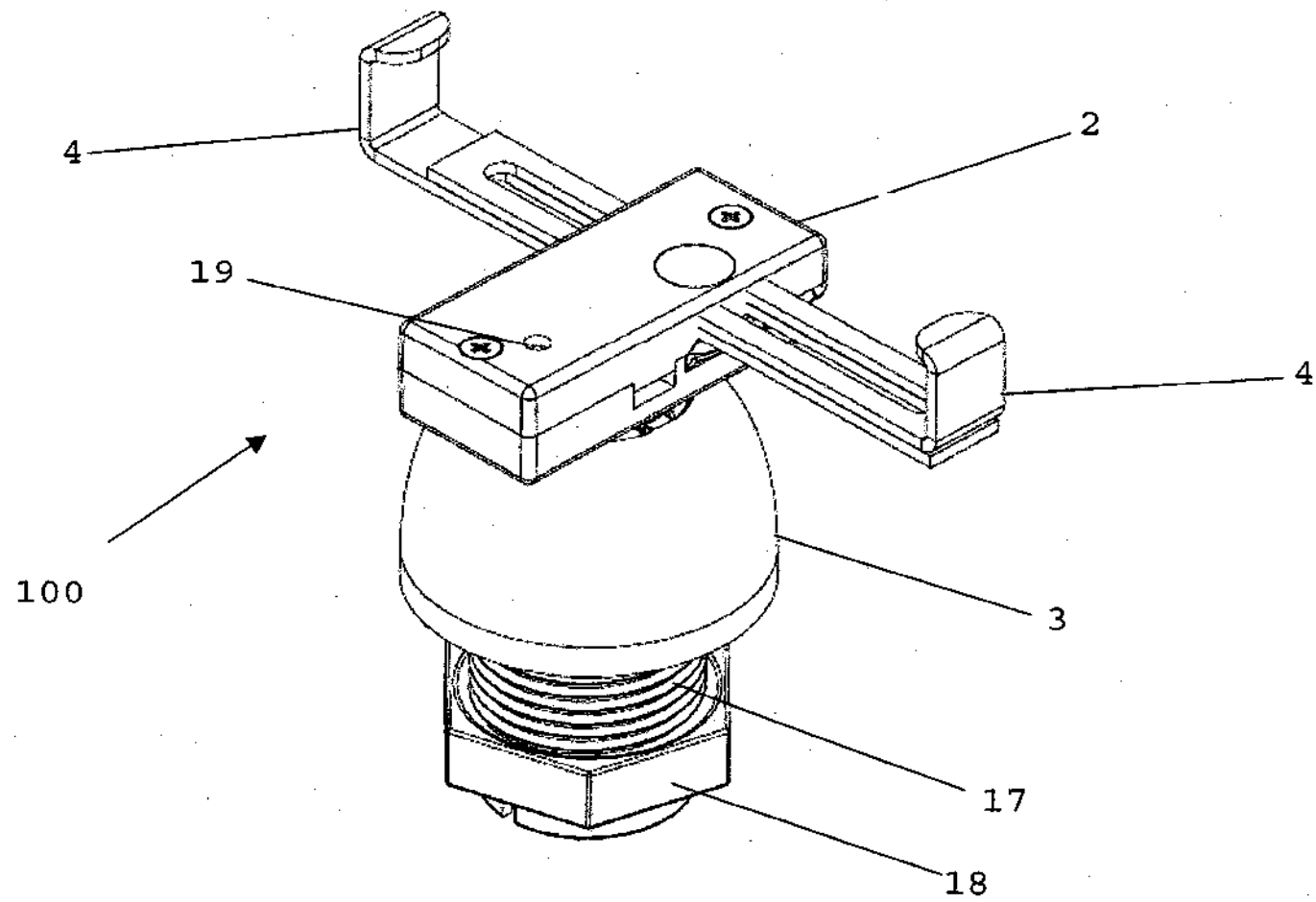


FIG. 4

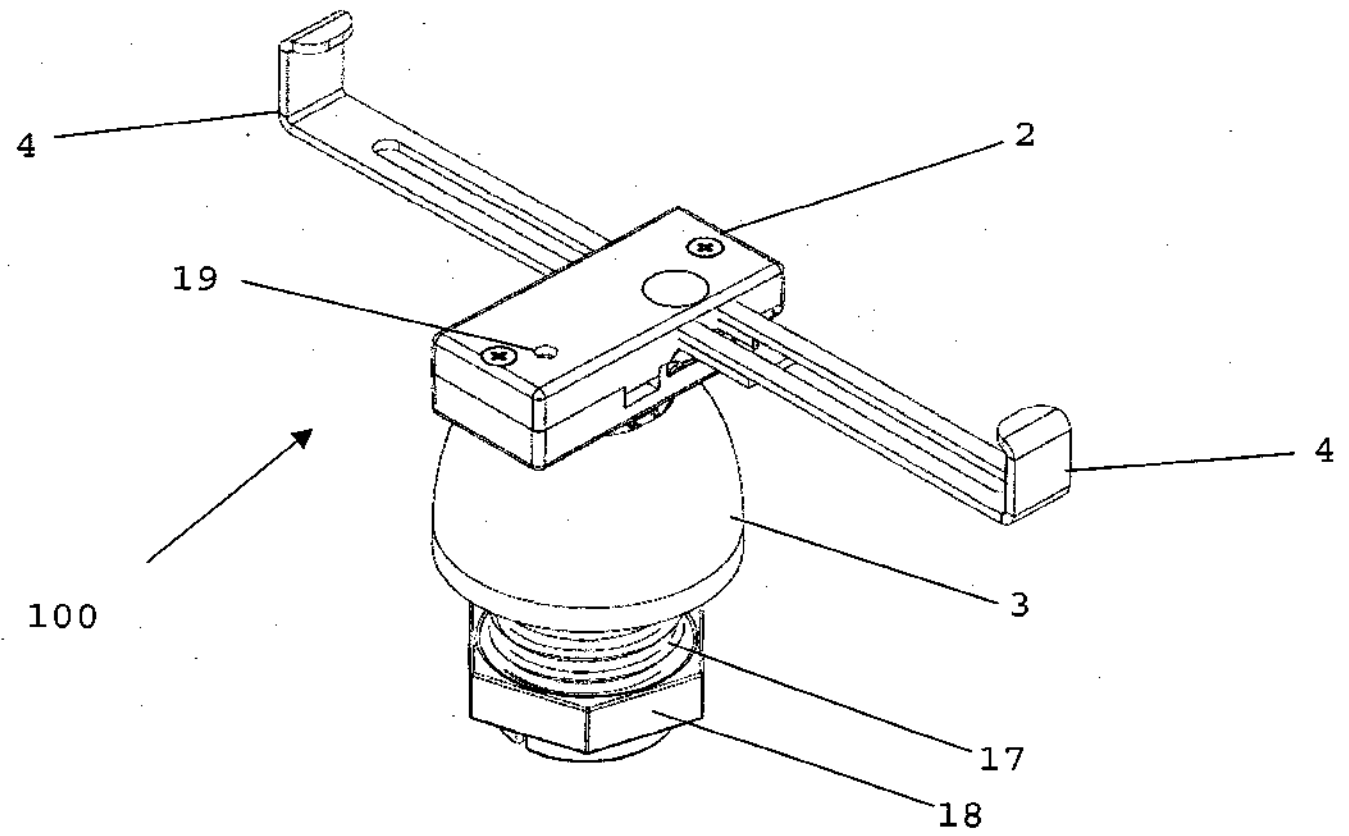


FIG. 5

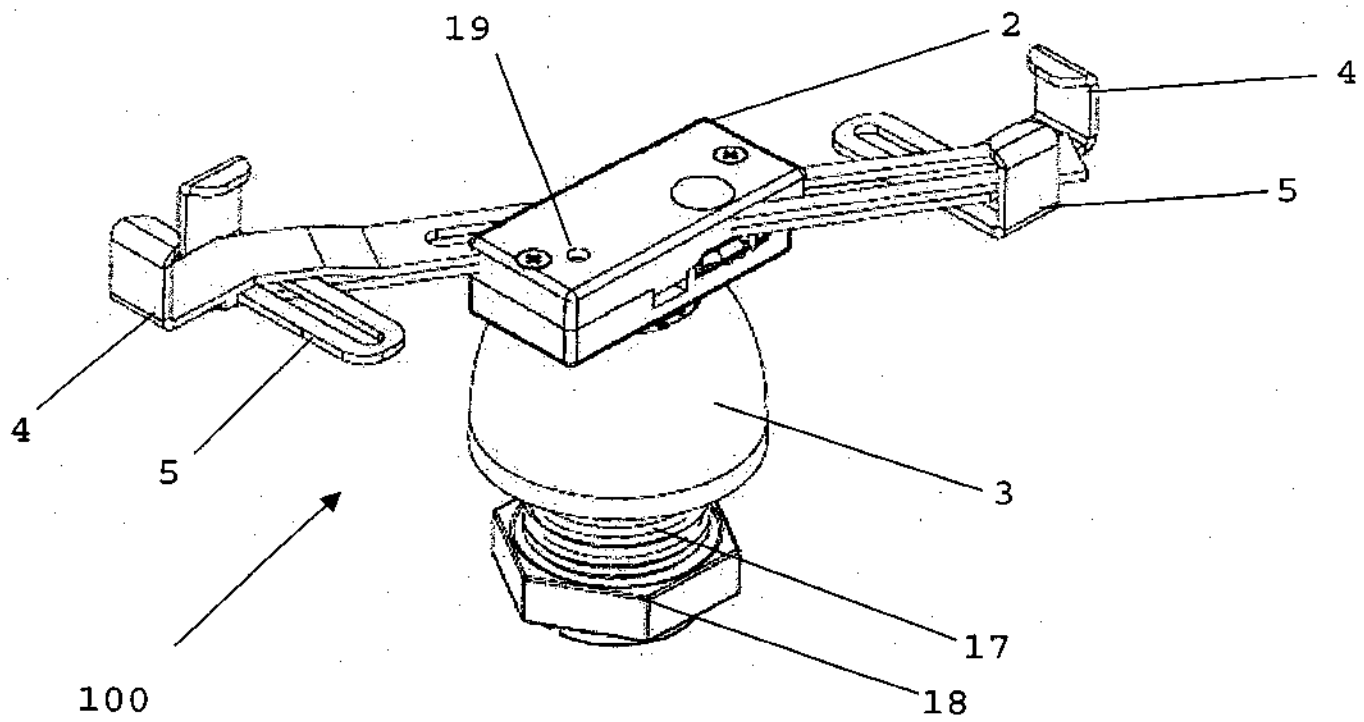


FIG. 6

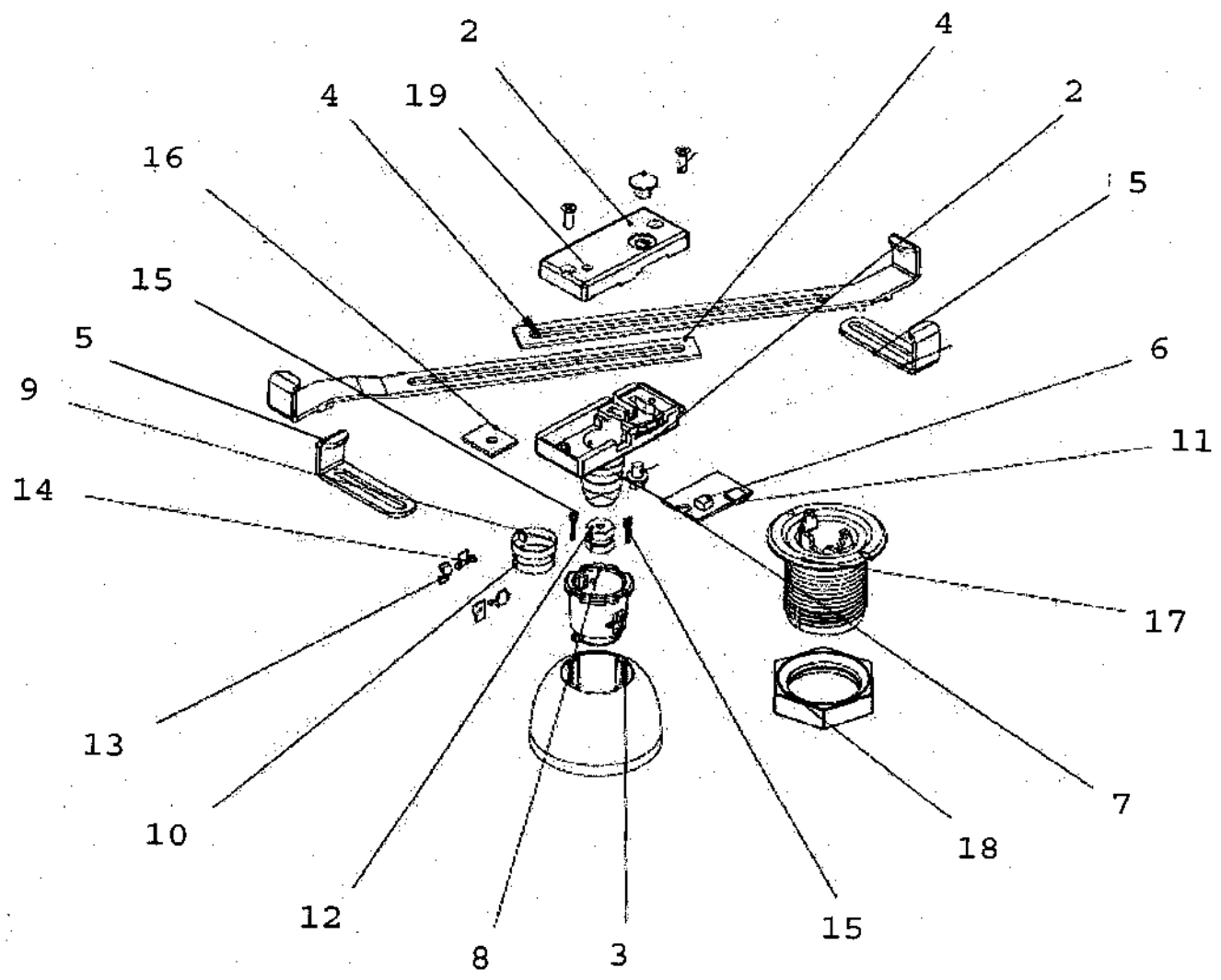


FIG. 7



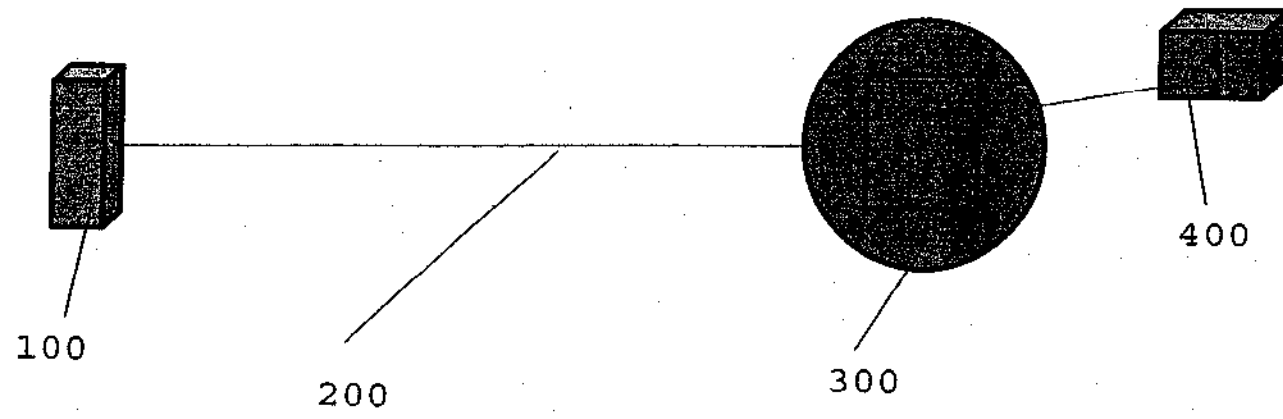


FIG. 8

**REFERENCES CITED IN THE DESCRIPTION**

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