ORGANISATION AFRICAINE DE LA PROPRIETE INTELLECTUELLE (O.A.P.I.)

(19) OAPI

(11) N° 11779

(51) Inter. Cl.[7] G09F 3/03

BREVET D'INVENTION

(21) **Numéro de dépôt :** 1200100058

(22) **Date de dépôt :** 14.09.1998

(30) **Priorité(s) :**

(24) **Délivré le :** 28.06.2002

(45) **Publié le :** 26 JUIL 2005

(73) **Titulaire(s) :**

JELAVIC Ivan
Viska 7, 21000 SPLIT (HR)

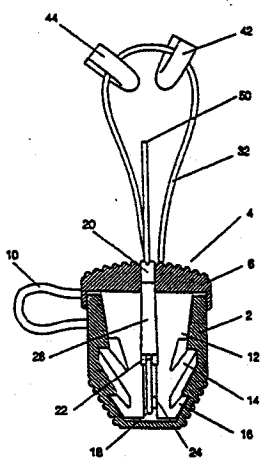
(72) **Inventeur(s) :** (Le titulaire)

(74) **Mandataire :** Cabinet J. EKEME
B.P. 6370
YAOUNDE - Cameroun

(54) **Titre :** Coded security seal with a protective cover.

(57) **Abrégé :**

The coded safety seal with a protective cover is first and foremost meant to be used for sealing the electricity meters, containers of any kind, wagons, tugs, cisterns, trucks, mail bags and warehouses. It contains of the masculine part (4) and feminine part (2) that are of a flat shape mutually connected by a thread (10). The masculine part (4) has a protective cover (6), the body with two pairs of elastic spurs, the longer one (14) and the shorter one (16). Along both sides of the masculine part there are grooves (24, 26 and 28, 30), that are in the centre of the masculine part connected by the opening (18), and on the top of the protection cover by the opening (20). Starting from the bottom of the masculine part and through the protection cover (6) runs a safety wire (32) which is tightly connected with the masculine part. The loose end (50) of the safety wire serves for embracing the objects that we want to seal. The feminine part (2) with a hole (34) and knobs (36 and 38) that are adjusted to receive the lower part of the masculine part with the spurs, after the masculine part has been inserted into the feminine one. The protection cover (6) must properly rest on the feminine part (2) which enables the seal to be safe from violent opening without a visible damage. Code and alphanumerical signs (46 and 48) on the feminine part of the seal offer all the necessary information about the seal number, manufacturer, user, person that has installed the seal etc. Masculine part, feminine part and the thread are made of a transparent material which makes any violent attempt to open the seal and sloppy assembling easily visible.



11779

CODED SECURITY SEAL WITH A PROTECTIVE COVER

THE DESCRIPTION OF THE INVENTION

1. TECHNICAL FIELD

The subject of the invention belongs to the fields of TREATMENT and PROCESSING; TRAFFIC and TRANSPORT (International patent classification section B - subsection TRANSPORT).

According to the international patent classification the subject of the invention has been classed and marked by classification symbol B 65 which defines:

TRANSPORT, PACKING, STORAGE, HANDLING OF THIN OR THREAD-LIKE MATERIALS.

The subject of the invention has been classed by symbol B 65 D defining:

accessories, locks or a suitable equipment;packing equipment; parcels.

The subject of the invention may be classed by an additional classifying symbol B65B defining: Means for visualialisation of the information (display); advertisments, signs, labels and name-plates.

2. TECHNICAL PROBLEM

The technical problem that has been solved by this invention emerges from the question how to manufacture a seal that will provide absolute security, easy handling besides being cheap and very light. Such a seal must entirely meet the requirement of impossible detaching the male from the female seal part without a visible damage while the security

wire must provide a clear warning that the seal has been twisted or pulled by force. Each seal must be marked by its number and other relevant data. The installing of such a seal should be performed manually and without any accompanying tools.

3. BACKGROUND ART

Nowadays we use seals made of either lead or plastic which are put together of one or two parts. Such seals can easily be misused by unauthorized persons in the way that he/she either enlarges the opening through which the wire pass and ropes that it connects or by disconnecting the body from the casing without damaging it. After that one wire end is pulled out allowing easy entering into the protected room or access to an equipment. The wire is then pulled through the seal opening again and under the pressure of outer cover or seal body it is brought into the same condition as it was before the misusage.

For example, US patent No. 5.762.386 discloses a seal comprising two separate elements: namely, a receptacle and an insert.

The receptacle has a cavity for receiving the insert.

The insert comprises a body portion, a top portion and a security wire. On the front and rear face of the body portion there are longitudinal channels which extend from the bottom face of the body portion to the top portion of the insert where they come out through two separate openings. The longitudinal channels are connected by connecting channel at the bottom face of the body portion of the insert. On the insert there is one pair of flanges whose tops are slanted at an large angle with respect to the central axis of the insert. The security wire is partially embedded in the top portion and body portion of the insert. The wire is being pulled one time through the longitudinal channels on the body portion of the insert.

The top portion of the insert is sized to cover the opening of the receptacle. When the insert is pulled in the receptacle, the top portion of the insert only leans against the opening of the receptacle.

On the receptacle there is made a shaft at whose free end is a knob. On the top portion of the insert there is made a flexibile strap at whose free end there is a socket. When the

receptacle and the insert are assembled, the socket receives the knob forming a ball and socket-type hinge joint.

From the aforesaid follows that the insert of such a seal only leans against the opening of the receptacle, it is not embracing the receptacle, so there is a clearance between the two which could allow the inserting of a suitable metal object for pulling out the insert from the receptacle. The insert has only one pair of flanges whose tops are slanted at an large angle with respect to the central axis of the insert. The longitudinal channels on the body portion of the insert are connected only at the bottom face of the body portion of the insert so the security wire can be pulled through the longitudinal channels only one time. The security wire is only partially embedded in the top portion and body portion of the insert. The receptacle and the insert are being connected by pulling the knob of the shaft of the receptacle into the socket of the flexibile strap of the insert, forming a ball and socket-type hinge joint, which means that there is the possibility to separate the receptacle and the insert and to replace this receptacle with the new one, which can not be seen at once because the receptacle has no alphanumerical sign. Theese mentioned features give greater possibility for misusage of the seal.

4. THE ESSENCE OF THE INVENTION

The essence of this invention is that the seal has a feminine and a masculine part and a security wire. The masculine part has a protection cover that embraces the femine part when the seal is installed. This prevents the mechanical separation of the masculine from the feminine part. The masculine part is provided by grooves through which the safety wire passes embracing the thing that is being sealed. Two pairs of spurs on the masculine part, after having been pushed into the opening of the feminine part, take their place on the knobs of the feminine part which prevents pulling out the masculine part from the feminine part. The masculine and the feminine part of the seal are connected by a thread made of the same material to enable easier handling.

5. THE DESCRIPTION OF THE INVENTION FUNCTIONING

The seal that is the subject of this invention has a flat shape, consists of two parts, masculine and feminine, connected by a thread.

The masculine part of the seal consists of a protective cover, body and a safety wire. The protection cover has a groove on its brim into which the feminine part enteres after the instalment. The protection cover has an opening on its upper part through which the security wires pass towards the grooves on the seal body. The body of the seal, starting from the protection cover towards the bottom, is conically made narrow. On the body there are two symmetrical pairs of elastic spurs. In the middle of the body there are longer spurs and the shorter spurs are placed at the bottom. The tops of the spurs are slanted 3 - 8 degrees from the central axis of the seal body which guarantees the firm connection on the knobs in the feminine part. There are parallel grooves on both sides of the body which are connected by a passage at the bottom of the body and in the protection cover they enter into the mutual opening where the free end of the security wire passes through. In the central part of the body the grooves are connected by an opening. Through the body and the protective cover passes the security wire. It can be of any length, with one loose end, while the other end is firmly connected to the body. The security wire has a metal base around which a thin metall wire is tightly and spirally wound.

The feminine part has a groove that is slightly slanted at its front part so that the masculine part can be placed. At the further part of the groove there are two pairs of knobs on which the spur tops of the masculine part rest when the masculine part is inserted into the feminine part.

When inserting the masculine part into the feminine one the longer pair of the spurs is slightly bent towards the centre and enlarges again only after having passed over the first knob pair. Somewhat later the shorter pair of spurs is bent towards the centre too and the spurs enlarge instantly after passing the second knob pair. This prompt assuming of the starting position is accompanied by a sound signal that confirms the correct insertion of the masculine part into the feminine one. While doing this the feminine part has to enter into

the forseen opening on the protection cover of the masculine part. This provides a secure protection against the violent separation of the masculine from the feminine part without visible mechanical damages.

The masculine and the feminine parts are connected by a thread that keeps them constantly together.

The perfection of this invention lies in the fact that the masculine part has a protection cap against any kind of violent opening of the seal, that it has two pairs of elastic spurs, that it has a safety wire with a metal base around which a thin metal thread is wound spirally, that the feminine part has grooves with two pairs of knobs and that after inserting the masculine part into the feminine one a clear sound signal is heard to confirm that the masculine part cannot be pulled out without a mechanichal damaging of the protection cover, feminine part or the security wire.

6. THE DESCRIPTION OF THE DRAWINGS

The advantages and the characteristics of the presented invention can be more clearly seen from the following description which relates to the drawing enclosed.

The enclosed drawings present:

Fig. 1 shows the open seal, its front side view.
Fig. 2 shows the open seal, its left side view.
Fig. 3 shows the open seal, its upper side view.
Fig. 4 shows the open seal, its its right side view.
Fig. 5 shows the open seal, its its bottom side view.
Fig. 6 shows the cross-section A-A of the open seal.
Fig. 7 shows a detail of the spur top.
Fig. 8 shows longitudional section B-B of one half of the seal body.
Fig. 9 shows the security wire.

Fig.10 shows the assembled seal, its front view.

Fig.11 shows the assembled seal, its left side view.

Fig.12 shows the cross-section E-E of the assembled seal, its upper side view

Fig.13 shows the assembled seal, its right side view.

Fig.14 shows the assembled seal, its bottom side view.

Fig.15 shows the cross-section D-D of the assembled seal

Fig.16 shows the cross-section C-C of the assembled seal

Fig.17 shows the assembled seal in perspective with code and alphanumerical signs and flag.

Fig. 18 shows the assembled transparent seal, its front side view.

Fig. 19 shows the assembled transparent seal, its back side view.

According to the Fig. 2, 3, 4 and 5 the sealing mechanism of this invention has feminine part 2, masculine part 4 and a thread 10. The masculine part 4 has a protective cover 6 with a groove 8 and a hole 20, body 12, a longer pair of spurs 14, a shorte pair of spurs 16, a passage between the grooves at the bottom of the body 18, the hole 22 between the grooves in the centre of the body, a lower groove 24 and 26, the upper groove 28 and 30, the security wire 32 with a loose end 50. At the upper outer side of the protective cover 6 there are knobs-grooves 54.

According to Fig. 6 the feminine part 2 has an opening 34 with knobs 36 on which the longer pair of the spurs 14 are placed and with the knobs 38 on which the shorter pair of spurs 16 are placed when the masculine part 4 is inserted into the opening 34 of the feminine part 2. After that the masculine part 4 cannot be pulled out of the feminine part 2 without a visible mechanical damage.

The top ends of the spurs 14 and 16 have according to the Fig. 7, are slightly slanted (3 - 8 degrees) in relation to the body axis 12. This guarantees a better placing on the knobs in the seal casing.

The security wire 32, according to Fig. 8, is firmly built in the masculine part 4 and it extents through the entire length of the body 12. The free end of the security wire 50 can be of any length and it embraces the objects to be sealed. After this, the free end of the

wire is being pulled into the masculine part through the opening 20 in the protective cover 6.

The security wire, according to the Fig. 9, has a metal base 32 around which a thin metal thread 40 is spirally tightly wound. The safety wire made in such a way provides enough friction to guarantee that the safety wire cannot be pulled out after inserting the masculine into the feminine part. Each violent pulling or bending of the safety wire causes the separation of the thin thread 40 from the metal base 32 visually indicating that there has been an unauthorized attempt to pull out the safety wire from the body of the seal.

Fig. 10, 11, 12, 13 and 14 show the closed seal after the instalment of the safety wire on the object that has to be sealed 42 and 44.

Fig. 15 and 16 show the cross-section of the installed seal where the protective cover 6 of the masculine part 4 rests on the upper part of the feminine part 2. This makes the pulling out of the body 12 with the spurs 14 and 16 impossible.

Fig. 15 presents one of the ways in which the security wire 32 can be inserted into the masculine part 4. After embracing the objects to be sealed 42 and 44 by the loose end of the safety wire 50, it is then pulled through the opening 20 into the groove 30, then through the opening 22 to the other side into the groove 24. After that it passes through the passage 18 again into the groove 26 and 28 and finally comes out through the opening 20.

The safety wire may also be pulled through in such a way that after it has passed through the opening 20 it runs along the groove 26 and 28, passes through the passage 18 along the groove 24 to the opening 22 through which the wire is pulled to the groove 28 and again through the opening 20 out of the masculine part 4.

After the security wire 32 has been pulled through the masculine part 4 is inserted into the feminine part 2. At the same time the longer spurs 14 slide along the longer slope of the feminine part while the shorter ones 16 pass through freely. Because of the elasticity the longer spurs are slightly bent towards the centre, and when they reach the end of the slope or knob 36, the shorter spurs 16 simultaneously touch the knobs 38 and slightly bent. By further pushing of the masculine part 4 into the feminine part 2 both pairs of spurs are

placed at the same time into the forseen enlargment and promptly spread apart. Then a click-sound can be heard indicating that the masculine part has reached the bottom of the feminine part. The short idle pace that can be felt when pulling the protection cover after that shows that the seal has been correctly installed.

At this point the mechanism provides a secure protection, and each violent attempt to open it leaves visible mechanichal traces.

Fig. 10 and 17 show the installed seal with the code 46 and alphanumerical 48 signs on the broader side of the feminine part 2. Other relevant data can be written on the other side too. The flag 56 may contain a mark of the seal user.

There are grooves with knobs 52 and 54 at the outer shorter side of the feminine part 2 and at the upper side of the protection cover 6. These grooves with knobs enable the secure and easy inserting the masculine into the feminine part of the seal avoiding the slidling of the fingers.

Fig. 18 and 19 show the installed seal which has the masculine and the feminine parts made out of a transparent material. It enables any kind of violent opening or sloppy assembling to be noticed easily.

CLAIMS

1. The coded safety seal with the protective cover suitable for sealing the electricity meters and containers of any kind as well as the waggons, tugs, cisterns, mail bags and trunks, comprising the feminine part (2), thread (10), masculine part (4) with longitudinal grooves (24, 26) and (28, 30) that are connected by the passage (18) at the bottom of the masculine part (4), *characterized in* that the masculine part (4) has an opening (22) in the centre of the body (12) by which both longitudinal grooves (24, 26) and (28, 30) are connected in the centre, that the masculine part (4) has a protective cover (6) with an opening (20) at the top in which both longitudinal grooves (24, 26) and (28, 30) meet, and that the protective cover (6) has a groove (8) on its brim which permits the catching of the feminine part (2) by the protective cover (6) when the masculine part (4) is inserted into the opening (34) of the feminine part (2).

2. The safety seal, according to the Claim 1, *characterized in* that on the body (12) of the masculine part (4) there are two pairs of spurs (14) and (16), symmetrically arranged on both narrower sides of the body (12), that the longer pair of the spurs (14) is placed in the centre and the shorter one (16) at the bottom of the body, and that the top ends of the spurs are slightly bent from 3 - 8 degrees in relation to the axis of the body.

3. The safety seal, according to the Claim 1 nad 2, *characterized in* that at the entrance into the feminine part (2) there is a slightly sloped flat part on which the body of the masculine part (4) is placed, and that the groove (34) of the feminine part (2) has two pairs of knobs (36) and (38) on which the tops of the spurs (14) and (16) rest when the masculine part (4) is inserted into the opening (34) of the feminine part (2).

4. The safety seal, according to the Claim 1 to 3, *characterized in* that when the masculine part (4) is inserted into the opening (34) of the feminine part (2) both pairs of spurs (14) and (16) are slightly bent towards the centre, the longer pair of spurs (14)

is more and earlier bent while the shorter one (16) is less and later bent, but, they turn into the right position at the same time when they take their place on the knobs (36) and (38) which is accompanied by the characteristic click-sound indicating that the seal has correctly been installed.

5. The safety seal, according to the Claim 1 and 2, *characterized in* that in the masculine part (4) there is a firm built-in safety wire (32) whose loose end (50) serves for embracing the object that is to be sealed, that the safety wire has a metal basic wire (32) around which a thinner metal thread (40) is spirally wound and firmly attached to the basic wire (32), but which can, in case that the safety wire is several times bent or pulled, be detached from the basic wire (32), which presents a visible warning that there has been an unauthorized attempt of opening the sealing mechanism.

6. The safety seal, according to the Claim 1, *characterized in* that on the upper part of the protection cover (6) and narrower flank sides of the feminine part (2) there are grooves (54) and (52) that prevent the finger sliding when inserting the masculine (4) into the feminine part (2), which means that the seal can be installed without help of any accessory tools.

7. The safety seal, according to the Claims 1, 2 and 5 , *characterized in* that a flag (56) for writing out the data is placed at the loose end of the safety wire.

8. The safety seal, according to the Claim 1, *characterized in* that on the outer larger sides of the feminine part (2) code (46) and other alphanumerical (48) signs can be applied and these marks contain the number of the seal, identification data of the user and the person who has installed the seal, the time of the installation and other important data.

9. The safety seal, according to the Claims 1 to 8, *characterized in* that the feminine part (2), masculine part (4) and the thread (10) are made of a transparent material which makes any violent attempt to open the seal and sloppy assembling easily visible.

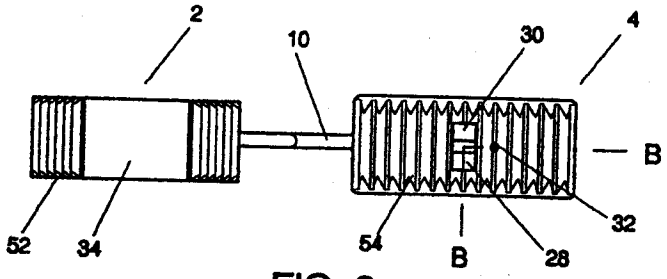


FIG. 3

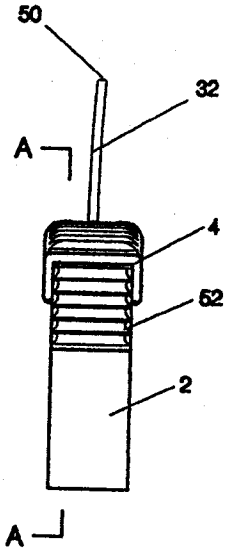


FIG. 2

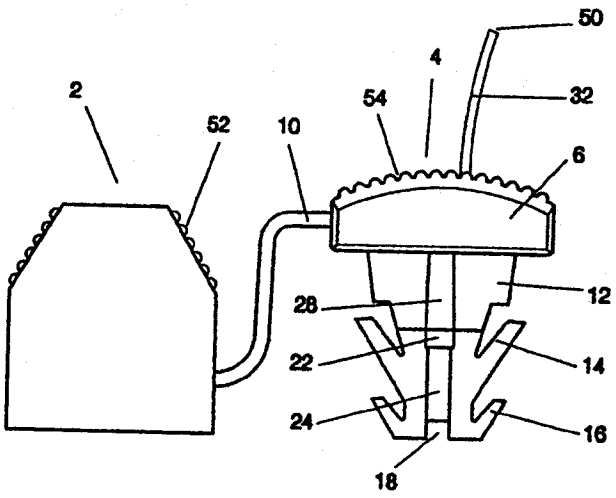


FIG. 1

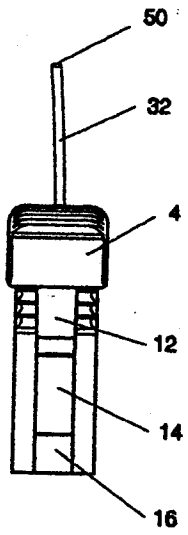


FIG. 4

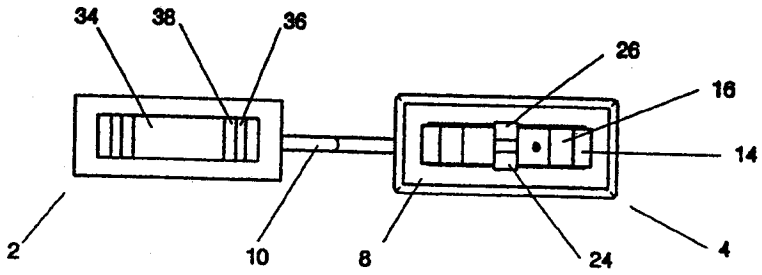


FIG. 5

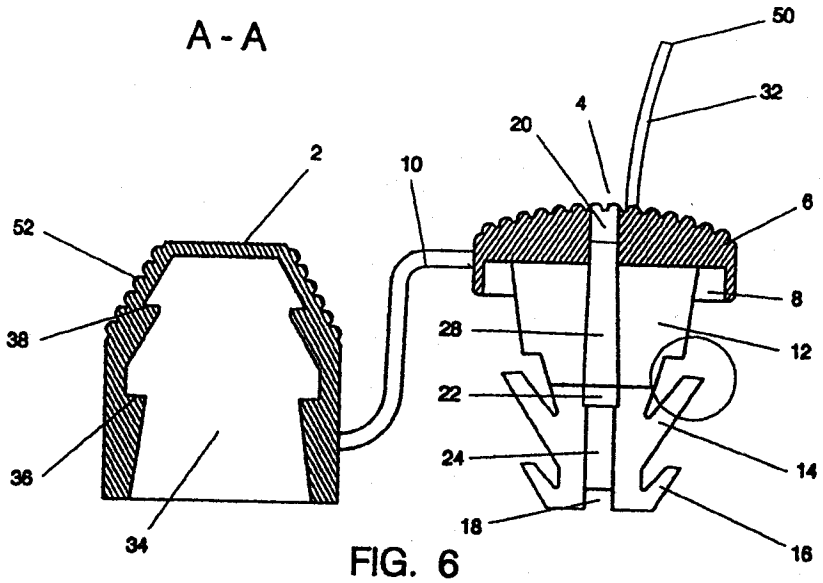


FIG. 6

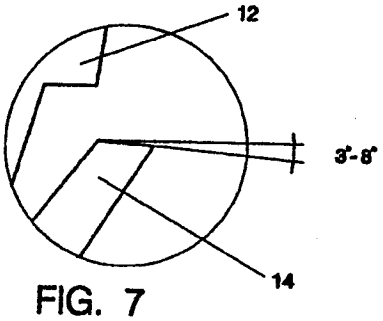


FIG. 7

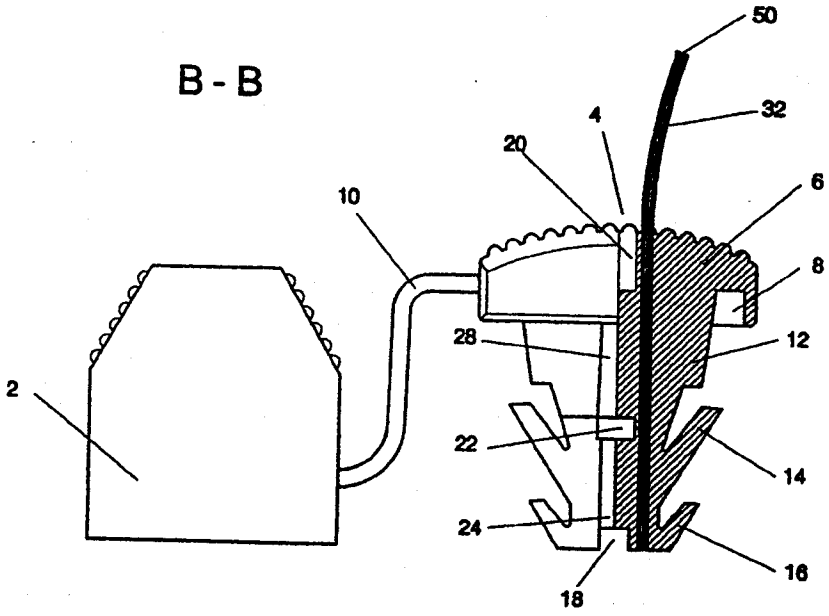


FIG. 8

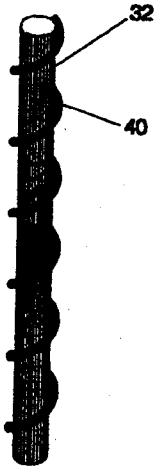


FIG. 9

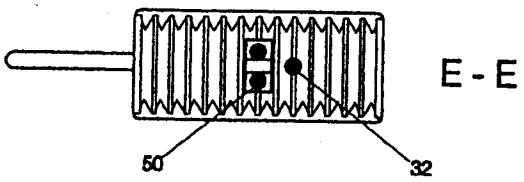


FIG. 12

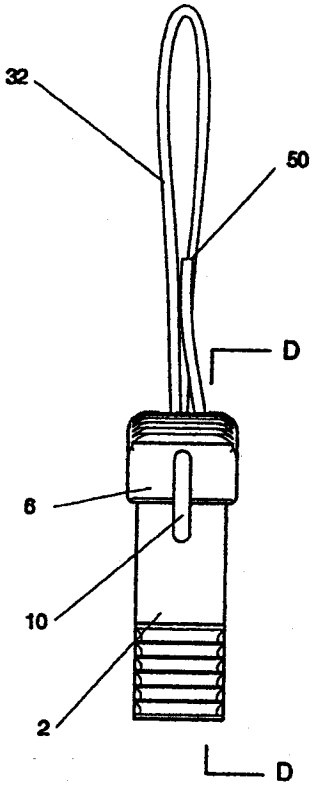


FIG. 11

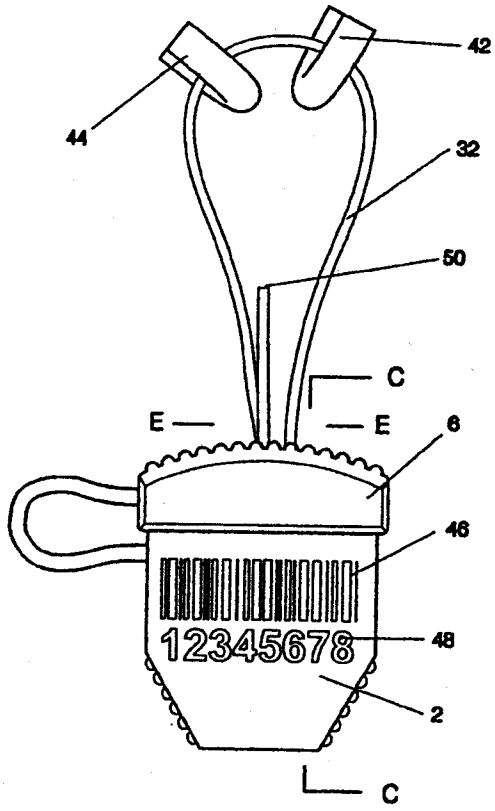


FIG. 10

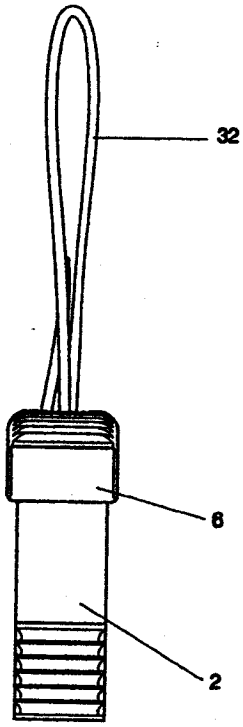


FIG. 13

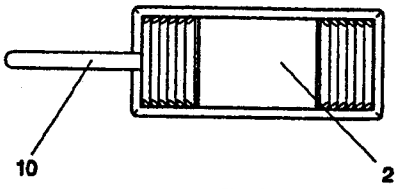
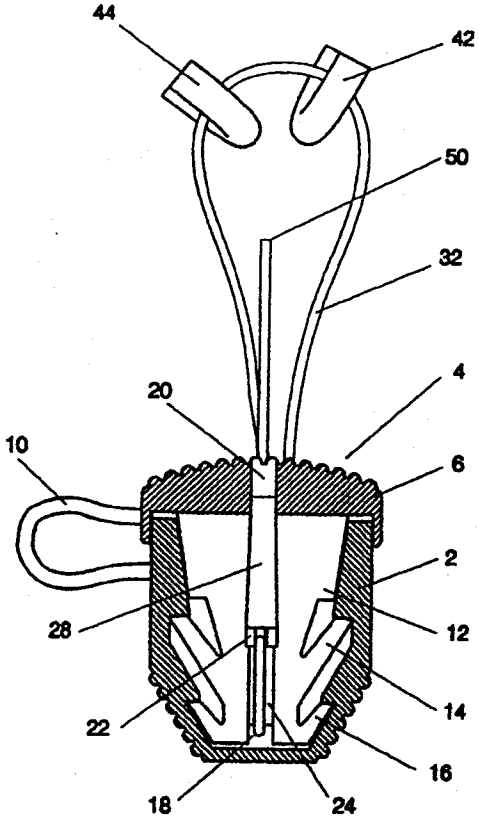
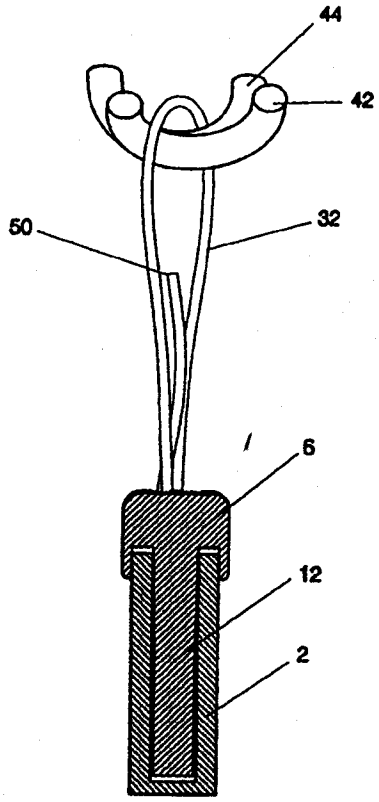


FIG. 14



D - D

FIG. 15



C - C

FIG. 16

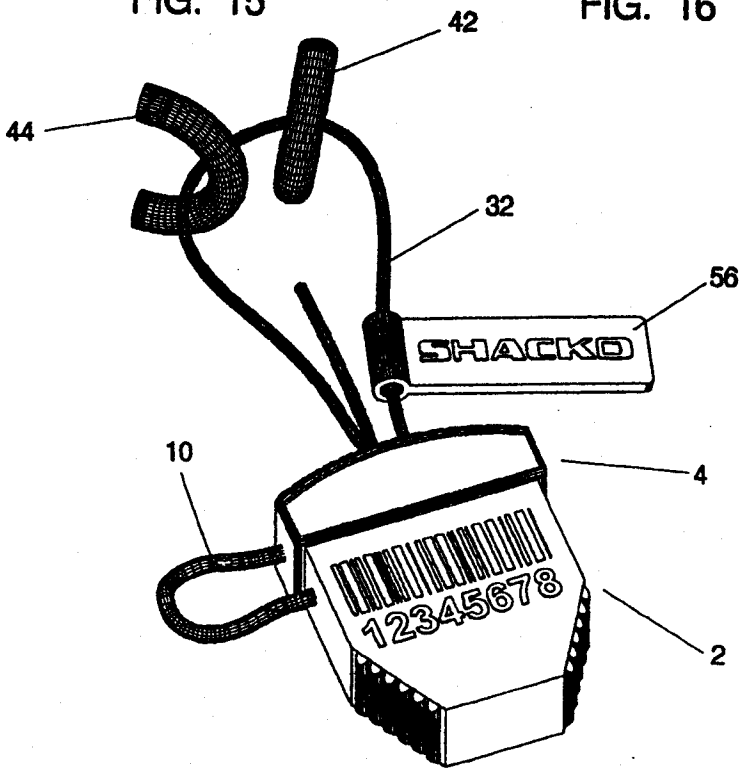


FIG. 17

11779

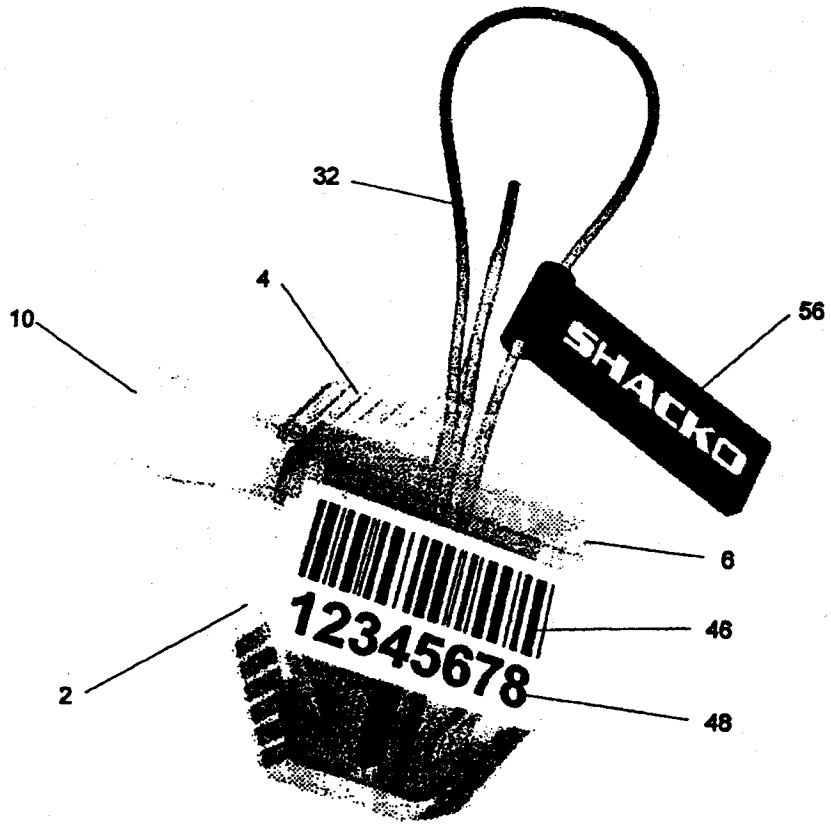


FIG. 18

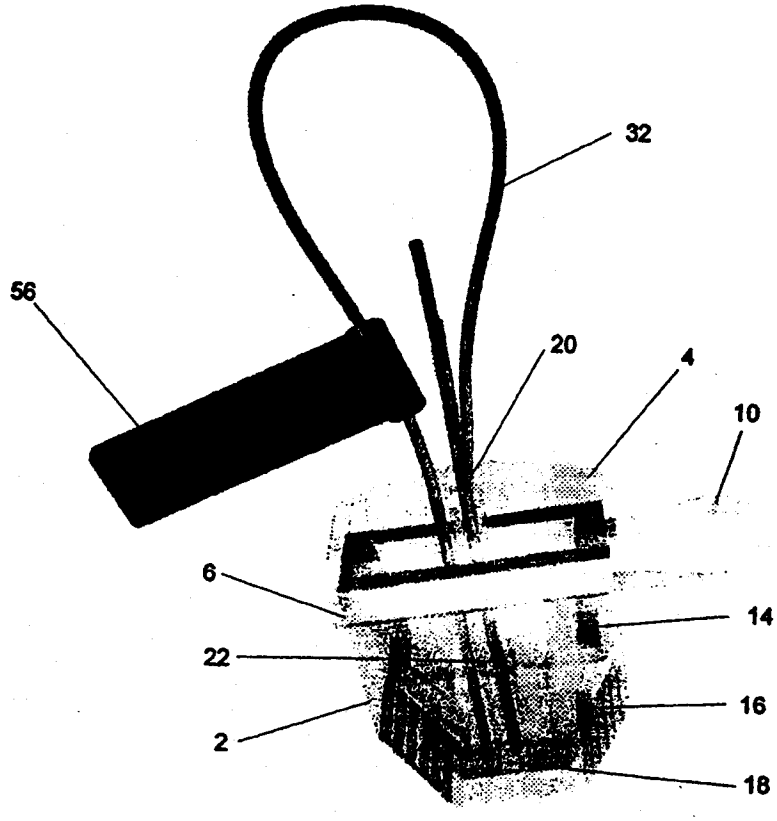


FIG. 19