(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 060 733 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
**11.09.2019 Bulletin 2019/37**

(21) Application number: **14855852.1**

(22) Date of filing: **30.09.2014**

(51) Int Cl.:
***E05B 35/06*** *(2006.01)* ***F16B 39/12*** *(2006.01)*
***E05B 83/02*** *(2014.01)* ***B65D 90/22*** *(2006.01)*
***F16B 5/02*** *(2006.01)* ***F16B 39/16*** *(2006.01)*
***E05C 1/02*** *(2006.01)*

(86) International application number:
**PCT/ZA2014/000055**

(87) International publication number:
**WO 2015/061811 (30.04.2015 Gazette 2015/17)**

# (54) A LOCKING MECHANISM

SPERRMECHANISMUS

MÉCANISME DE VERROUILLAGE

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR**

(30) Priority: **23.10.2013 ZA 201308360**

(43) Date of publication of application:
**31.08.2016 Bulletin 2016/35**

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**DE-C- 805 012**
**GB-A- 221 433**
**US-A- 541 159**
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## Description

### Field of the invention

**[0001]** This invention is in the field of locking devices and related security products.

### Background to the invention

**[0002]** The inventor is aware that theft of goods in transit is a common problem and results in significant monetary losses.

**[0003]** The inventor believes that this invention overcomes certain deficiencies in other locking mechanisms.

**[0004]** DE 805 012 C discloses a locking mechanism comprising a bolt that is biased by a screw spring, wherein the bolt is configured to engage a groove defined by a locking bar, wherein the bolt is biased to an engaged position by a spring and the bolt comprises a threaded shaft for engaging the thread of a threaded key, the key being configured to retract the locking pin through translation of torque and rotational motion on the key by a user into a linear force on the bolt, thereby causing said bolt to disengage from the groove defined by the surface and to remain in a disengaged position while the key is engaged with the threaded surface of the threaded shaft.

**[0005]** WO 2008/018031 A2 discloses a locking decive that includes a shank receivable through an aperture defined by a surface of a bracket and securing means for securing the shank relative the bracket, thereby to inhibit the unauthorized removal of the shank from the bracket and bracket from the container.

**[0006]** US 541 159 A discloses a screw with a thread and a counter-thread wherein the diameter of the counter-thread is smaller than the diameter of the thread.

### Summary of the invention

**[0007]** According to an aspect of the invention there is provided a locking mechanism, the locking mechanism including a housing in the form of a first nut which is configured to receive a shank, a spring - loaded member comprising a body and a locking pin, wherein the locking pin is configured to engage an aperture defined by a surface of a second nut, the body and the locking pin being biased to an engaged position by a spring and wherein the body defines a threaded surface for engaging the thread of a threaded key, the key configured to retract the locking pin through translation of torque and rotational motion on the key by a user into a linear force on the spring loaded member, thereby causing said locking pin to disengage from the aperture defined by the surface and to remain in a disengaged position while the key is engaged with the threaded surface of the body, characterised in that the first nut includes a cuff for receiving the second nut and thereby limiting unauthorised access to the second nut.

**[0008]** The threaded surface of the body for engaging the threaded key may be in the form of an extension of the body of the member and may be substantially elongate in form.

It is to be understood from this specification that in another embodiment of the invention, the threaded surface of the body for engaging the threaded key may be a surface of an aperture defined by the body of the member.

**[0009]** The threaded surface of the body and the threaded key may be left hand threaded.

**[0010]** The threaded surface of the body and the threaded key may be a right hand thread.

**[0011]** The locking pin may include guides to prevent the locking pin from rotating around its long axis relative to the housing.

**[0012]** In an embodiment of the invention, the locking pin may be threaded.

**[0013]** The locking pin may be essentially elongate and may be circular in cross-section.

**[0014]** In an embodiment of the invention, the locking pin may be any suitable shape, including but not limited to a triangular or rectangular cross-section.

**[0015]** In another embodiment of the invention, the body may define an aperture, which may be threaded for engaging the threaded key.

**[0016]** The first nut may include a pressure washer for facilitating the retaining of the body and the locking pin in the housing.

**[0017]** The shank may be generally elongate.

**[0018]** The shank may be a generally cylindrical elongate and may include a tapered end.

**[0019]** The shank may include a thread and may include a first threaded section and a second counter-threaded section. The first threaded section may include a larger diameter relative the second counter-threaded section.

**[0020]** A first nut may have a larger bore diameter relative a second nut bore diameter.

**[0021]** The first nut may include a thread and the second nut may include a counter-thread.

**[0022]** The first nut may be shaped and dimensioned to engage with the first threaded section of the shank and the second nut may be shaped and dimensioned to engage with the second counter-threaded section of the shank.

**[0023]** Typically, the first nut is advances along the threaded portion of the shank to an engaged position.

**[0024]** Advancement of the second nut along the shank towards the engaged position of the first nut may assist to discourage the removal of the first nut.

**[0025]** The body and the locking pin housed in the first nut and the second nut are shaped and dimensioned to lock the first nut relative the second nut, thereby to assist in limiting rotation and removal from the shank of the first and second nut.

### Detailed description of the drawings

**[0026]** The invention will now be described and ex-

plained with reference to the following non-limiting drawings and examples wherein;

Figure 1 is a cross-sectional drawing of a locking mechanism not forming part of the present invention, wherein the housing is in the form of a nut;

Figure 2 is a plan view of the key;

Figure 3 is a cross-sectional drawing of another embodiment not forming part of the invention;

Figure 4 is a cross-sectional drawing of an embodiment of the invention;

Figure 5 is a cross-sectional through the locking mechanism, the first and the second nut.

**[0027]** In the Figures 4 and 5 reference numeral 10 generally refers to a locking mechanism in accordance with the invention.

**[0028]** According to an aspect of the invention there is provided a locking mechanism 10 including a housing 26 in the form of a first nut 30 which is configured to receive a shank (not shown). The first nut 30 includes a cuff 42 for receiving the second nut 44 and thereby limiting unauthorised access to the second nut 44. The locking mechanism 10 further includes a spring loaded member 11 comprising a body 12 and a locking pin 14, wherein the locking pin 14 is configured to engage an aperture 18 defined by a surface 119 (see figure 5), the locking pin 14 being biased to an engaged position by a spring and wherein the body 12 defines a threaded surface 20 for engaging the thread 36 of a threaded key 34, the key 34 being configured to retract the locking pin 14 through the translation of torque and rotary motion on the key 34 by a user into a linear force on the member 11, thereby causing said locking pin 14 to disengage from the aperture 18 defined by the surface 119 and to remain in a disengaged position (not shown) while the key 34 is engaged with the threaded surface 20 of the body 12.

**[0029]** The first nut 30 includes a pressure washer 28 for facilitating the retaining of the spring loaded member 11 in the housing 26.

**[0030]** The threaded surface 20 of the body 12 and the threaded key 34 are left hand threaded. The locking pin 14 is threaded, essentially elongate and circular in cross - section.

**[0031]** In the embodiment of the invention shown in Figure 4 and 5 the threaded surface 20 of the body 12 engaging the threaded key 34 is in the form of an extension 21 which is substantially elongate in form.

**[0032]** Figure 3 depicts an embodiment where the body 12 defines an aperture 19, which is threaded 20, for engaging a modified embodiment of the threaded key (not shown). The first nut 30 is configured to receive the shank (not shown).

**[0033]** The surface 119 defining the aperture 18 (Figure 5) for receiving the locking pin 14 is in the form of a second nut 44.

**[0034]** The shank (not shown) is a cylindrical elongate member and includes a tapered end and a thread having a first threaded section and a second counter-threaded section. This first threaded section has a larger diameter relative to the second counter - threaded section.

**[0035]** A first nut 30 has a larger bore diameter 31 relative to a second nut's 44 bore diameter 45. The first nut 30 includes a thread 32 and the second nut 44 includes a counter - thread 40.

**[0036]** In the embodiment shown in the invention, the first nut 30 is shaped and dimensioned to engage with the first threaded section of the shank (not shown) and the second nut 44 is shaped and dimensioned to engage the second threaded section of the shank (not shown).

**[0037]** In the embodiment of the invention shown in Figure 4 and 5, the first nut 30 includes the cuff 42 for receiving the second nut 44, thereby limiting unauthorised access to the second nut 44.

**[0038]** Typically, the first nut 30 is advanced along the threaded portion of the shank (not shown) to an engaged position.

**[0039]** Advancement of the second nut 44 along the shank (not shown) towards the engaged position of the first nut 30 assists in discouraging the removal of the first nut 30.

**[0040]** The spring loaded member 11 housed in the first nut 30 and the second nut 44 are shaped and dimensioned to lock the first nut 30 relative the second nut 44, thereby to assist in limiting rotation and removal from the shank of the first 30 and the second nut 44.

## Claims

1. A locking mechanism comprising a housing (26) in the form of a first nut (30) which is configured to receive a shank, a spring-loaded member (11) comprising a body (12) and a locking pin (14), wherein the locking pin (14) is configured to engage an aperture (18) defined by a surface of a second nut (44), the body (12) and locking pin (14) being biased to an engaged position by a spring (16) and wherein the body (12) defines a threaded surface (20) for engaging the thread of a threaded key (34), the key (34) being configured to retract the locking pin (14) through translation of torque and rotational motion on the key (34) by a user into a linear force on the spring loaded member (11), thereby causing said locking pin (14) to disengage from the aperture (18) defined by the surface and to remain in a disengaged position while the key (34) is engaged with the threaded surface (20) of the body (12), **characterised in that** the first nut (30) includes a cuff (42) for receiving the second nut (44) and thereby limiting unauthorised access to the second nut (44).

2. A locking mechanism as claimed in claim 1, **characterized in that** the threaded surface (20) of the body (12) for engaging the threaded key (34) may be in the form of an extension of the body (12) of the member and substantially elongate in form.

3. A locking mechanism as claimed in claim 1, **characterized in that** the threaded surface (20) of the body (12) for engaging the threaded key is a surface of an aperture defined by the body of the member.

4. A locking mechanism as claimed in any one of the preceding claims, **characterized in that** the locking pin (14) includes guides to prevent the locking pin (14) from rotating around its long axis relative to the housing.

5. A locking mechanism as claimed in claim 4, **characterized in that** the locking pin (14) is threaded.

6. A locking mechanism as claimed in any one of claims 4 or 5, **characterized in that** the locking pin (14) is essentially elongate and circular in cross-section, or **in that** the locking pin (14) is triangular in cross-section, or **in that** the locking pin is rectangular in cross-section.

7. A locking mechanism as claimed in any one of the preceding claims, **characterized in that** the first nut (30) includes a pressure washer (28) for facilitating the retaining of the body (12) and the locking pin (14) in the housing.

8. A locking mechanism as claimed in any one of the preceding claims, wherein the first housing is configured to receive a shank which is generally elongate and includes a tapered end, the shank especially including a thread.

9. A locking mechanism as claimed in any one of the preceding claims, wherein the first housing is configured to receive a shank which includes a first threaded section and a second counter-threaded section, wherein especially the first threaded section includes a larger diameter relative to the second counter threaded section.

10. A locking mechanism as claimed in claim 9, **characterized in that** the first nut (30) has a larger bore diameter relative the second nut (44) bore diameter, and/or **in that** the first nut (30) includes a thread and the second nut (44) includes a counter-thread.

11. A locking mechanism as claimed in claims 9 or 10, **characterized in that** the first nut (30) is shaped and dimensioned to engage with the first threaded section of the shank and the second nut (44) is shaped and dimensioned to engage with the second counter-threaded section of the shank, and/or **in that** the first nut (30) is advanced along the threaded portion of the shank to an engaged position.

12. A locking mechanism as claimed in claim 11, **characterized in that** advancement of the second nut (44) along the shank towards the engaged position of the first nut (30) assists to discourage the removal of the first nut (30), wherein the body (12) and the locking pin (14) housed in the first nut (30) and the second nut (44) are shaped and dimensioned to lock the first nut (30) relative to the second nut (44), thereby assisting in limiting rotation and removal from the shank of the first (30) and second nut (44).

**Patentansprüche**

1. Verriegelungsmechanismus, umfassend ein Gehäuse (26) in Form einer ersten Mutter (30), die eingerichtet ist, einen Schaft aufzunehmen, ein federbelastetes bzw. federbeaufschlagtes Element (11), das einen Körper (12) und einen Verriegelungs- bzw. Sicherungsstift (14) umfasst, wobei der Sicherungsstift (14) eingerichtet ist, in eine Öffnung (18) einzugreifen, die durch eine Oberfläche einer zweiten Mutter (44) definiert ist, wobei der Körper (12) und der Sicherungsstift (14) durch eine Feder (16) in eine Eingriffsposition vorgespannt sind, und wobei der Körper (12) eine Gewindeoberfläche (20) zum Eingriff mit dem Gewinde eines Gewindeschlüssels (34) definiert, wobei der Schlüssel (34) eingerichtet ist, den Sicherungsstift (14) durch Übersetzung bzw. Übertragung eines Drehmoments und einer Drehbewegung auf den Schlüssel (34) durch einen Benutzer in eine lineare Kraft auf das federbelastete Element (11) einzuziehen, wodurch bewirkt wird, dass sich der Sicherungsstift (14) von der durch die Oberfläche definierten Öffnung (18) löst und in einer ausgerückten Position bleibt, während der Schlüssel (34) mit der Gewindeoberfläche (20) des Körpers (12) in Eingriff steht, **dadurch gekennzeichnet, dass** die erste Mutter (30) eine Hülse bzw. Manschette (42) zur Aufnahme der zweiten Mutter (44) aufweist und dadurch den unbefugten Zugang bzw. Zugriff zu der zweiten Mutter (44) begrenzt.

2. Verriegelungsmechanismus nach Anspruch 1, **dadurch gekennzeichnet, dass** die Gewindeoberfläche (20) des Körpers (12) zum Eingriff mit dem Gewindeschlüssel (34) in der Form einer Verlängerung des Körpers (12) des Elements und im Wesentlichen in länglicher Form vorliegen kann.

3. Verriegelungsmechanismus nach Anspruch 1, **dadurch gekennzeichnet, dass** die Gewindeoberfläche (20) des Körpers (12) zum Eingriff mit dem Gewindeschlüssel eine Oberfläche einer Öffnung ist,

die durch den Körper des Elements definiert ist.

4. Verriegelungsmechanismus nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Sicherungsstift (14) Führungen aufweist, um zu verhindern, dass sich der Sicherungsstift (14) um seine Längsachse gegenüber dem Gehäuse dreht.

5. Verriegelungsmechanismus nach Anspruch 4, **dadurch gekennzeichnet, dass** der Sicherungsstift (14) ein Gewinde aufweist.

6. Verriegelungsmechanismus nach einem der Ansprüche 4 oder 5, **dadurch gekennzeichnet, dass** der Sicherungsstift (14) im Wesentlichen länglich und kreisförmig im Querschnitt ist, oder dass der Sicherungsstift (14) im Querschnitt dreieckig ist, oder dass der Sicherungsstift im Querschnitt rechteckig ist.

7. Verriegelungsmechanismus nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die erste Mutter (30) einen Druckreiniger (28) umfasst, um das Halten bzw. Festhalten des Körpers (12) und des Sicherungsstiftes (14) im Gehäuse zu erleichtern.

8. Verriegelungsmechanismus nach einem der vorhergehenden Ansprüche, wobei das erste Gehäuse eingerichtet ist, einen Schaft aufzunehmen, der im Allgemeinen länglich ist und ein konisches Ende aufweist, wobei der Schaft insbesondere ein Gewinde aufweist.

9. Verriegelungsmechanismus nach einem der vorhergehenden Ansprüche, wobei das erste Gehäuse eingerichtet ist, einen Schaft aufzunehmen, der einen ersten Gewindeabschnitt und einen zweiten Gegengewindeabschnitt aufweist, wobei insbesondere der erste Gewindeabschnitt einen größeren Durchmesser in Bezug auf den zweiten Gegengewindeabschnitt aufweist.

10. Verriegelungsmechanismus nach Anspruch 9, **dadurch gekennzeichnet, dass** die erste Mutter (30) einen größeren Bohrungsdurchmesser relativ zum Bohrungsdurchmesser der zweiten Mutter (44) aufweist, und/oder dass die erste Mutter (30) ein Gewinde und die zweite Mutter (44) ein Gegengewinde aufweist.

11. Verriegelungsmechanismus nach Anspruch 9 oder 10, **dadurch gekennzeichnet, dass** die erste Mutter (30) derart geformt und dimensioniert ist, dass sie mit dem ersten Gewindeabschnitt des Schaftes in Eingriff kommt, und die zweite Mutter (44) derart geformt und dimensioniert ist, dass sie mit dem zweiten Gegengewindeabschnitt des Schaftes in Eingriff kommt, und/oder dass die erste Mutter (30) entlang des Gewindeabschnitts des Schaftes in eine Eingriffsposition bewegt wird.

12. Verriegelungsmechanismus nach Anspruch 11, **dadurch gekennzeichnet, dass** das Vorwärtsbewegen der zweiten Mutter (44) entlang des Schaftes in Richtung der Eingriffsposition der ersten Mutter (30) dazu beiträgt, das Entfernen der ersten Mutter (30) zu erschweren bzw. zu behindern, wobei der Körper (12) und der in der ersten Mutter (30) und der zweiten Mutter (44) aufgenommene Sicherungsstift (14) geformt und dimensioniert sind, um die erste Mutter (30) in Bezug auf die zweite Mutter (44) zu verriegeln bzw. zu sichern, wodurch die Drehung und Entfernung der ersten (30) und zweiten Mutter (44) von dem Schaft begrenzt wird.

**Revendications**

1. Mécanisme de verrouillage comprenant un boîtier (26) sous la forme d'un premier écrou (30) qui est configuré pour recevoir une tige, un élément à ressort (11) comprenant un corps (12) et une broche de verrouillage (14), dans lequel la broche de verrouillage (14) est configurée pour engager une ouverture (18) définie par une surface d'un second écrou (44), le corps (12) et une broche de verrouillage (14) étant rappelés en une position engagée par un ressort (16) et le corps (12) définit une surface filetée (20) pour engager le filet d'une clé filetée (34), la clé (34) étant configurée pour rétracter la broche de verrouillage (14) par translation du couple et du mouvement de rotation sur la clé (34) par un utilisateur en une force linéaire sur l'élément (11) à ressort, de sorte que ladite broche de verrouillage (14) se désengage de l'ouverture (18) définie par la surface et reste dans une position désengagée alors que la clé (34) est en prise avec la surface filetée (20) du corps (12), **caractérisé en ce que** le premier écrou (30) comprend un manchon (42) pour recevoir le second écrou (44) et limiter ainsi un accès non autorisé au second écrou (44).

2. Mécanisme de verrouillage selon la revendication 1, **caractérisé en ce que** la surface filetée (20) du corps (12) pour engager la clé filetée (34) peut se présenter sous la forme d'une extension du corps (12) de l'élément et s'allonger sensiblement en forme.

3. Mécanisme de verrouillage selon la revendication 1, **caractérisé en ce que** la surface filetée (20) du corps (12) pour engager la clé filetée est une surface d'une ouverture définie par le corps de l'élément.

4. Mécanisme de verrouillage tel que revendiqué dans l'une quelconque des revendications précédentes, **caractérisé en ce que** la broche de verrouillage (14) comprend des guides pour empêcher la broche de verrouillage (14) de tourner autour de son axe longitudinal par rapport au boîtier.

5. Mécanisme de verrouillage selon la revendication 4, **caractérisé en ce que** la broche de verrouillage (14) est filetée.

6. Mécanisme de verrouillage selon l'une quelconque des revendications 4 ou 5, **caractérisé en ce que** la broche de verrouillage (14) est essentiellement allongée et de section transversale circulaire, ou **en ce que** la broche de verrouillage (14) est de section transversale triangulaire, ou **en ce que** la broche de verrouillage est de section transversale rectangulaire.

7. Mécanisme de verrouillage tel que revendiqué dans l'une quelconque des revendications précédentes, **caractérisé en ce que** le premier écrou (30) comprend une rondelle de pression (28) pour faciliter le maintien du corps (12) et de la broche de verrouillage (14) dans le boîtier.

8. Mécanisme de verrouillage tel que revendiqué dans l'une quelconque des revendications précédentes, dans lequel le premier boîtier est configuré pour recevoir une tige qui est généralement allongée et comprend une extrémité conique, la tige comprenant notamment un filetage.

9. Mécanisme de verrouillage tel que revendiqué dans l'une quelconque des revendications précédentes, dans lequel le premier boîtier est configuré pour recevoir une tige qui comprend une première section filetée et une seconde section filetée, en particulier la première section filetée comprend un diamètre supérieur par rapport à la seconde section filetée.

10. Mécanisme de verrouillage selon la revendication 9, **caractérisé en ce que** le premier écrou (30) a un diamètre d'alésage supérieur à celui du second écrou (44) et/ou que le premier écrou (30) comprend un filetage et le second écrou (44) comprend un contre-fil.

11. Mécanisme de verrouillage selon la revendication 9 ou 10, **caractérisé en ce que** le premier écrou (30) est formé et dimensionné pour venir en prise avec la première section filetée de la tige et le second écrou (44) est formé et dimensionné pour venir en prise avec la seconde section contre filetée de la tige et/ou **en ce que** le premier écrou (30) est amené dans une position engagée, suivant la partie filetée de la tige, dans la direction du pas.

12. Mécanisme de verrouillage selon la revendication 11, **caractérisé en ce que** l'avancement du second écrou (44) le long de la tige vers la position engagée du premier écrou (30) aide à empêcher le retrait du premier écrou (30), le corps (12) et la broche de verrouillage (14) logés dans le premier écrou (30) et le second écrou (44) sont formés et dimensionnés pour bloquer le premier écrou (30) relativement au second écrou (44), contribuant de la sorte à limiter la rotation et le déplacement du corps de premier (30) et du second écrou (44).

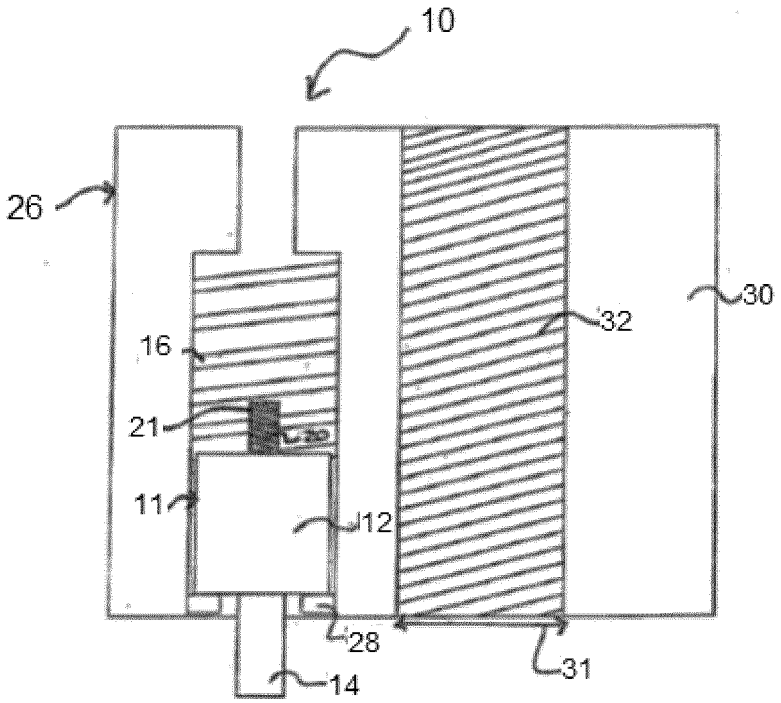


FIGURE 1

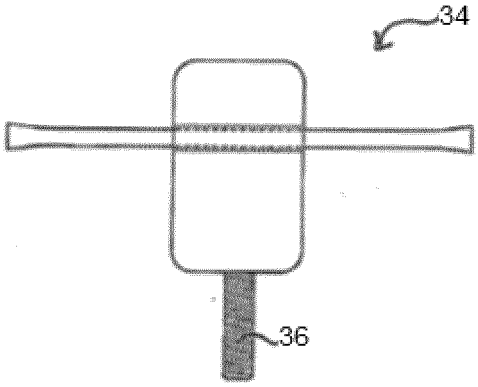


FIGURE 2

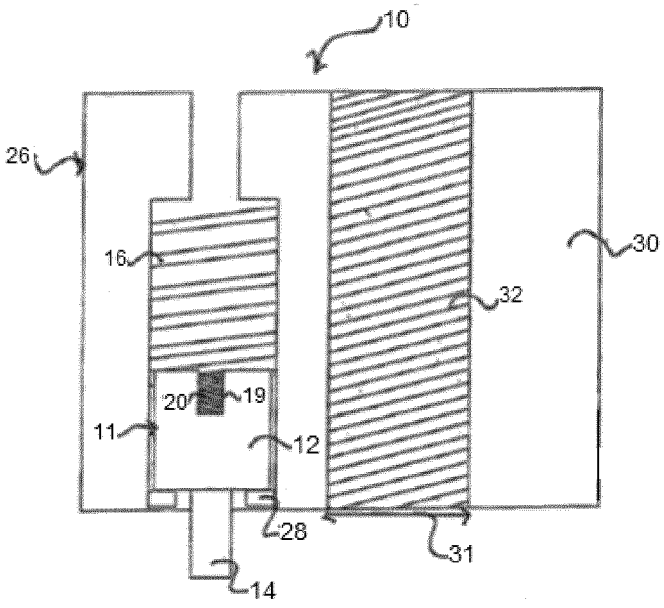


FIGURE 3

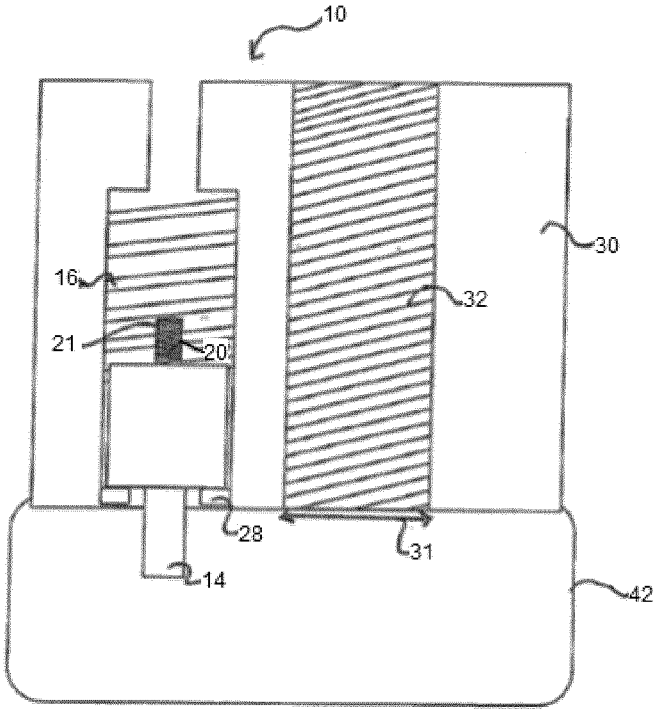


FIGURE 4

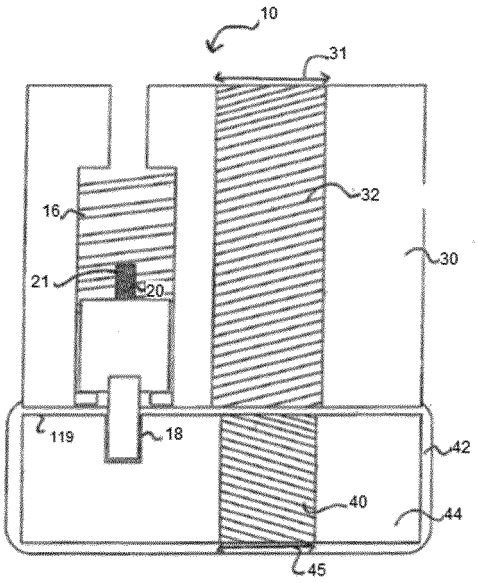


FIGURE 5

## REFERENCES CITED IN THE DESCRIPTION

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