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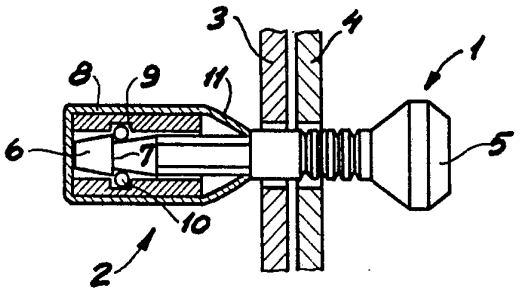
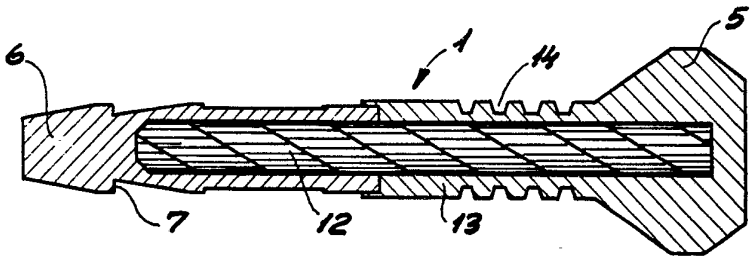
(54) Title: ENGAGEMENT LOCK

(57) Abstract

Engagement lock comprising two members (1 and 2) which can be interlokked after they are passed through the lokking rings (3, 4) of a container. The first member (1) is rod-shaped and has a head (5) which cannot pass through the locking rings (3, 4). Opposite the head it has an insertion end (6) of metal. The lock cannot be broken by bending the rod-shaped body from side to side because this body has a core of steel wire (12) whose elongation extends into the head. The elongation of the steel wire (12) is embedded in polyacetal which also forms the head (5), and the layer of polyacetal around the steel wire (12) has one or more annular grooves (14) in which it can break by bending the rod-shaped body.





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Engagement lock

The invention relates to an engagement lock, preferably for a container with locking rings, said lock comprising first and second members adapted for automatic interlocking after the first member has been introduced into a cavity provided in the second member, said first member comprising a rod-shaped body whose one end is adapted for being passed through the locking rings and introduced into the cavity, the other end of said rod-shaped body as well as said second member having such transverse dimensions as prevent them from being passed through the locking rings.

An engagement lock of this type is known from the Danish Patent No. 134 811 corresponding to the British Patent No. 1 498 526. This lock is opened by cutting the rod-shaped body by means of a strong pair of scissors or shears.

However, it has turned out to be possible for an unauthorized person to open this engagement lock by inserting a pipe across one of the two members of the lock and bending it from side to side until the rod-shaped body breaks.

The object of the invention is to provide an engagement lock of said type which cannot be opened in this manner and whose appearance will show clearly whether unauthorized persons have tried to tamper with it.

According to the invention there is provided an engagement lock, preferably for a container with locking

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rings, said lock comprising first and second members adapted for automatic interlocking after the first member has been introduced into a cavity provided in the second member, said first member comprising a rod-shaped body whose one end is adapted for being passed through the locking rings and introduced into the cavity, the other end of said rod-shaped body as well as said second member having such transverse dimensions as prevent them from being passed through the locking rings, characterized in that said one end of the rod-shaped body has attached therein a core in the form of a steel wire or spring wire or band or other elastic material extending away from said end, and that the other end of the rod-shaped body comprises a core formed by the end of said steel wire extending from said one end of the rod shaped body, and by a layer of rigid material sealingly attached to said core, the outermost part of said layer having said transverse dimension that forms a head.

If an attempt is made at opening the lock of the invention in the manner mentioned above, the material that surrounds and conceals the steel wire breaks and reveals such attempt, but the steel wire yields so as to still retain the head which cannot pass through the locking rings, and the container can therefore not be opened. Moreover, the material around the steel wire braces it, allowing the rod-shaped body, which forms one member of the lock, to be introduced into the other member to be interlocked with it by the stroke of a hammer, without the steel wire being unwound.

One or more annular grooves may be provided in the layer of material around the steel wire and the advantage of this is that when an attempt is made at

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opening the lock in said manner the layer breaks at the bottom of one of the grooves where the layer is thinnest. Thus, no cracks are formed in the longitudinal direction of the material and accordingly the attachment of the head to the steel wire remains completely intact.

It has been found that the steel wire may very expediently be surrounded by plastics, such as polyacetal. It has also been found that the steel wire may very expediently be surrounded by metal, e.g. steel, zinc or aluminium.

The invention is described in more detail below with reference to the drawing, in which

fig. 1 shows, partly in section, the locked state of a lock of the invention passed through the locking rings of a container, and

fig. 2 shows a longitudinal section of the member of the engagement lock which is formed by the rod-shaped body.

The engagement lock shown in fig. 1 comprises two members 1 and 2 which are adapted for automatic interlocking after the first member 1, which is in the form of a rod-shaped body, has been introduced into a cavity in the second member 2. The engagement lock is used for locking a container for the transport of goods, the rod-shaped body 1 being passed through the locking rings of the container, indicated by 3 and 4 in fig. 1, before it is interlocked with the second member 2 of the lock. The rod-shaped member 1, which is preferably circular in cross-section, has at one end a head 5 of considerably larger diameter than the rod-shaped body

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itself so that the head 5 cannot be passed through the locking rings 3 and 4.

At the opposite end of the head 5 the rod-shaped member 1 has a tapered insertion end 6 and rearwards of said taper an abruptly reduced cross-section area so as to produce a shoulder 7. From the shoulder 7 the cross-section is again increased in the direction of the head 5.

The second member 2 of the lock comprises a circular cylindrical sleeve 8 with an internal, annular recess 9 containing a locking ring 10. The sleeve 8 with the locking 10 is encased in a massive envelope 11 of plastics, e.g. polyacetal.

The two members 1 and 2 are interlocked when the insertion end 6 of the rod-shaped body 1 is passed through the locking ring 10 of the sleeve 8 and expands the locking ring 10 against its elastic force until the members 1 and 2 are engaged in the position shown in fig. 1 in which the locking ring 10 snaps behind the shoulder 7 of the rod-shaped body 1 as a consequence of the elastic force.

The lock is opened by cutting the rod-shaped body 1 by means of a pair of strong scissors or shears which are disposed between the head 5 and the locking ring 4 or between the envelope 11 and the locking ring 3.

The structure of the rod-shaped body 1 appears from fig. 2. The front, approximately half length of the body 1 with the insertion end 6 consists of a rigid material, preferably metal, in which a core in the form of a steel wire 12 is attached, said steel wire extending away from the insertion end almost in the entire length of

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the rest of the rod-shaped body 1. The opposite end of the steel wire 12 is embedded in a massive material which also forms the head 5. This material may e.g. be metal or plastics. In the shown embodiment polyacetal is used. A plurality of annular grooves 14 are formed in the polyacetal layer of the cylindrical part 13 forwards of the head 5 so that the thickness of the polyacetal layer on the steel wire is significantly thinner in the bottom of said grooves 14. When an attempt is made at breaking the rod-shaped body the polyacetal layer breaks at the bottom of one of the grooves and the attachment of the head 5 to the steel wire 12 is not affected by this. Therefore, the lock can only be opened by shears in the manner described.

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Patent claims:

1. An engagement lock, preferably for a container with locking rings, comprising first and second members adapted for automatic interlocking after the first member has been introduced into a cavity provided in the second member, said first member comprising a rod-shaped body whose one end is adapted for being passed through the locking rings and introduced into the cavity, the other end of said rod-shaped body as well as said second member having such transverse dimensions as prevent them from being passed through the locking rings,
characterized in that said one end of the rod-shaped body has attached therein a core in the form of a steel wire or spring wire or band or other elastic material extending away from said end, and that the other end of the rod-shaped body comprises a core formed by the end of said steel wire extending away from said one end of the rod-shaped body, and by a layer of rigid material sealingly attached to said core, the outermost part of said layer having said transverse dimension that forms a head.

2. An engagement lock according to claim 1 characterized in that one or more annular grooves are formed in the layer around the steel wire.

3. An engagement lock according to claim 1 or 2, characterized in that the layer around the steel wire consists of plastics, e.g. polyacetal.

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4. An engagement lock according to claim 1 or 2, c h a r a c t e r i z e d in that the layer around the steel wire consists of a metal.

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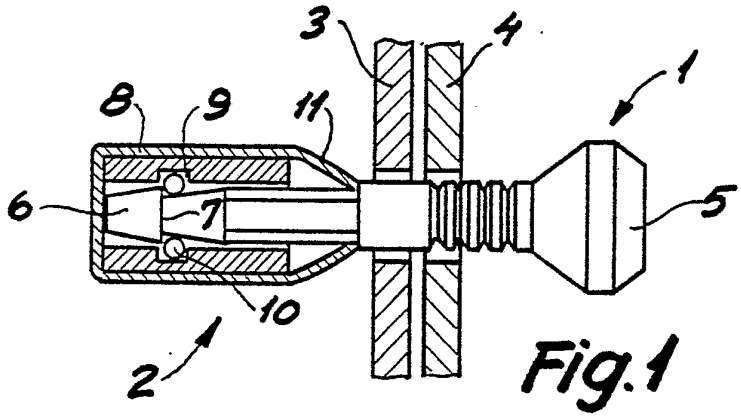

Fig.1

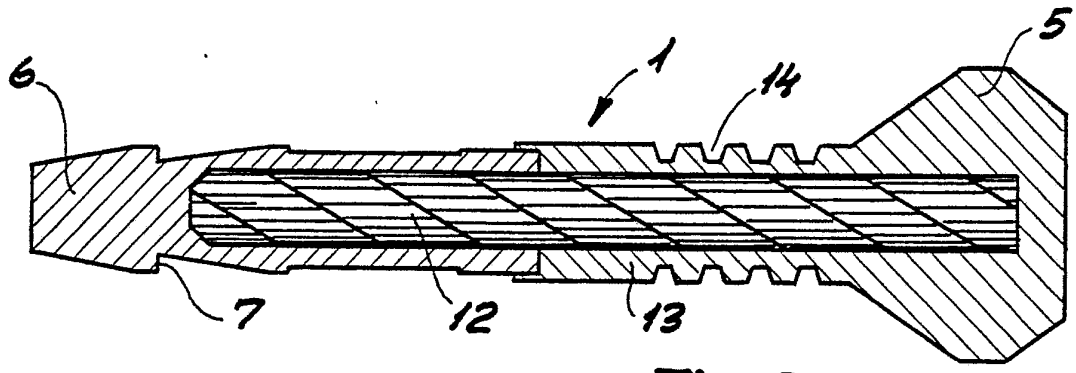

Fig.2

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INTERNATIONAL SEARCH REPORT

International Application No PCT/DK80/00059

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [3]

According to International Patent Classification (IPC) or to both National Classification and IPC 3

B 65 D 55/06, E 05 B 39/02

II. FIELDS SEARCHED

Minimum Documentation Searched [4]

Classification System	Classification Symbols
IPC 3	B 65 D 55/02, 06,10; E 05 B 39/00, 02
US Cl	292:307, 317-321, 327

Documentation Searched other than Minimum Documentation to the Extent that such Documents are included in the Fields Searched [5]

SE, NO, DK, FI classes as above

III. DOCUMENTS CONSIDERED TO BE RELEVANT [14]

Category *	Citation of Document, [16] with indication, where appropriate, of the relevant passages [17]	Relevant to Claim No. [18]
X	DK, B, 134 811 published 1977, January 24, P M Remark	1
X	CH, A, 263 455, published 1949, December 1, Jos. Fellman	1
X	US, A, 3 980 337 published 1976, September 14, see fig. 13 and 14, Moberg et al.	1, 3
L	US, A, 2 796 277 published 1957, June 18, see fig. 2 and 5, scores 58 and 62, W. M. Brooks et al.	2
A	US, A, 3 435 642 published 1969, April 1, see plasticlayer 18, A. Del Pesco	3
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* Special categories of cited documents: [15]

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IV. CERTIFICATION

Date of the Actual Completion of the International Search [2]	Date of Mailing of this International Search Report [2]
1980-12-05	1980 -12- 18
International Searching Authority [1]	**Signature of Authorized Officer [20]**
Swedish Patent Office	Jan-Olof Kyltner

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