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(54) **Method of certifying objects, sealing device and certifying system**

(57) Disclosed is a method of certifying objects, comprising the steps of: (a) locking to an object a sealing device comprising a holder with a cable attached thereto in a tamper proof manner, the locking being realized by inserting the cable into the holder, wherein the sealing device is provided with a visible marking sign attached thereto in a tamper proof manner, (b) inspecting of a state of the object and evaluating the obtained value of said state, and (c) installing a next marking sign on or at the sealing device in a tamper proof manner, which next marking sign is visually different from any marking sign already present on the sealing device. The steps (a)-(c) may be followed by a single or multiple repetition of steps (b) and (c).

Also disclosed is a sealing device, comprising a holder, a cable, and locking means for the cable, wherein the holder is provided with at least an outside surface bounded by a raised rim.

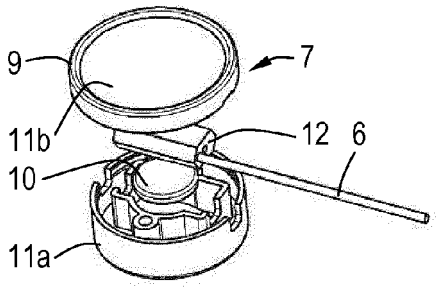

Fig.3A

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Description

[0001] The present invention relates to a method of certifying objects, comprising the step of locking to an object to be certified a sealing device comprising at least a holder with a cable attached thereto in a tamper proof manner, the locking being realized by inserting the cable into the holder to form a closed loop around the object, wherein the sealing device is provided with a visible marking sign attached thereto in a tamper proof manner. This includes variants wherein the sealing device itself is a visible marking sign. The phrase "attached in a tamper proof manner", when used in this document, indicates that the thing that is attached in a tamper proof manner cannot be released or removed without permanently damaging the thing or attachment, thus typically leaving permanent visible traces of the release or removal action.

[0002] The above method is known and serves to provide a reliable visible indication that a specific object is certified. For instance, towing equipment needs to be inspected and approved before its use in towing is allowed for, according to legal regulations. The state of towing objects inspected typically comprises the mechanical strength of the object, and/or indications thereof such as the presence/absence of impairments and rust as strength-reducing phenomena.

[0003] In the known method, the sealing device is in some cases provided with an RFID chip, that provides specific information to the object. Alternatively, an RFID chip may be provided in or at the object.

[0004] For many objects the regulations also require that inspection and certification are repeated after a given time span, for instance yearly.

[0005] With the known method, certification is possible in a reliable manner, due to the provision for making the device tamper proof.

[0006] However, in the case of frequently repeated inspections, after each inspection the sealing device is removed and a new one is installed. This is laborious and costly and also consumes materials. Moreover, in the case of RFID chips present in the sealing device, which is in itself sometimes advantageous over its presence in or at the object, additional steps are needed in order to prevent the object data from being lost or confused.

[0007] The invention has as a goal to provide an improved method of certifying objects of the above type, in particular an improved method that requires lower costs.

[0008] This goal is realized by the method according to claim 1.

[0009] Since only a next, i.e. a new, marking sign is installed after the repeated inspection, on or at the sealing device, in a tamper proof manner, the marking sign cannot be removed without visibly damaging the sealing device and thus a safe certification becomes possible without the need for removal of the entire sealing device at each inspection; it suffices to add only a new marking sign.

[0010] As a result, the method according to the invention is as reliable as the known method but requires no removal steps, and does not require the installation of a new sealing device at the repeated inspection, which not only saves effort and the costs resulting there from, but also saves material costs.

[0011] In an embodiment of the method according to the invention, the steps (a)-(c) are followed by a single or multiple repetition of steps (b) and (c). Thus, a sequence of steps (a), (b), (c), (b), (c), arises and possibly (a), (b), (c), (b), (c), ..., (b), (c). Here, the advantages mentioned for the independent claim 1 occur repeatedly, and thus it also becomes possible to obtain a larger cost reduction.

[0012] In a further embodiment, the marking signs are installed on the holder. At this place, it is relatively simple to obtain a reliable and tamper proof fixation of each marking sign and to obtain a good visibility of the marking signs. This is especially the case when the marking signs comprise stickers.

[0013] It is further advantageous to install the marking sign over the marking sign or signs already present and withdrawing the latter sign(s) from eyesight. This requires a limited amount of surface area for the signs, which allows for e.g. a smaller holder, and also prevents confusion of the marking signs or speeds up recognition of the applicable marking sign; when the method is performed properly, only the applicable marking sign is visible.

[0014] In a further embodiment, each marking sign is of a predetermined type, wherein each such a type of marking sign represents a time span during which the certification is valid. For instance, the time span may coincide with a calendar year, and each year may have its own color. This may be in a cycle of six years, for example, after which cycle the same six different colors reappear.

[0015] In yet another embodiment, remotely readable data storage means irremovably present in or at the sealing device, e.g. in the tamper proof holder, are provided with information about the object to be certified. An example of remotely readable data storage means comprises an RFID chip. This has as an advantage that the same data storage means is used in various certification periods, as a result of which the risk of object data being confused with data of another object and the need of transferring the data into a new data storage means are taken away.

[0016] The invention further relates to a sealing device according to the independent claim 8. This device addresses the same problem as the method according to the invention described above, and enables the implementation of the method according to dependant claim 5 in particular. The rim serves as a demarcation of a surface area meant for applying the marking signs, in particular stickers that are stacked one over the other between the boundaries formed by the rim. It is noted that the rim need not be continuous; it may be for instance dotted of striped, since its function is mainly to indicate where the marking signs, in particular stickers, should be

put. The notion of rim should be interpreted accordingly; it may for instance also be a cam or edge, and does not need to stand perpendicular to the surface below it, but may be tilted or curved, or otherwise shaped, as long as it is suitable as an indication where to put or find a marking sign in particular a sticker on or at the sealing device.

[0017] The presence of the rim, as a visible and possibly tactile demarcation means, simplifies the application of a marking sign, in particular a sticker. It also encourages or even enforces the positioning of one sticker or marking sign over the other, the most recent one covering the earlier one(s) and withdrawing them from the eye.

[0018] In an embodiment, the surface surrounded by the rim is part of the outside surface of the holder. As already mentioned for the method according to the invention, this is a convenient position where it is relatively simple to obtain a reliable and tamper proof fixation of each marking sign and to obtain a good visibility of the marking signs. This is especially the case when the marking signs comprise stickers.

[0019] In an embodiment with electromagnetically readable identification means in the tamper proof holder, for instance an RFID transponder or RFID chip, it becomes possible to use the same data storage means in various certification periods, as a result of which the risk of object data being confused with data of another object and the need of transferring the data into a new data storage means are taken away.

[0020] In an embodiment, the holder comprises two parts that after assembly are mutually fixed by means of a one-way fastener can be opened only by visibly damaging at least one of the two parts. In this manner it is possible to obtain a tamper proof holder.

[0021] In a further embodiment, the locking means are provided with a continuous opening, in which opening the cable can be advanced in the direction of insertion in order to provide the closed loop with a variable length. In this manner, the locking means may be fitted into the tamper proof housing, thereby increasing the safety of the sealing device.

[0022] The invention also relates to a certification system according to independent claim 14. This system addresses the same problem as the method and sealing device according to the invention. In particular, the system according to the invention allows for covering marking signs, such as stickers, to cover each other fully, and thus to withdraw older signs from the eye and thus to reduce the risk of confusion of certification periods.

[0023] The invention will now be illustrated on the basis of a preferred embodiment, referring to the accompanying drawings and merely as an illustration of the invention and not in limitation thereof. In the drawings, similar parts are given identical reference numerals. Here

[0024] Figures 1a-1d show an embodiment of the method according to the invention,

[0025] Figures 2a-c show an embodiment of the sealing device according to the invention, wherein Figure 2a shows a top view of the holder of the sealing device, Figure 2b shows a cross sectional view of the holder over the line A-A in Figure 2a, and Figure 2c shows a cross sectional view of the holder over the line B-B in Figure 2a, and

[0026] Figures 3a and 3b show respectively an exploded view and an assembly view of the sealing device of Figure 2.

[0027] In Figure 1a, an eye sling hook 1 with latch 2, eye 3 and hoisting hook 4 is an object to be certified every year. After inspection of its state, in this example the mechanical condition of the eye sling hook 1, and evaluation of the state and approval thereof, a sealing device 5 as shown in Figure 2 and to be discussed below is installed at the eye 3 of the eye sling hook 1, as shown in Figure 1b. The installation comprises bending a cable 6 of the sealing device 5 around the material that surrounds the eye 3 and inserting one end thereof in a holder 7, the other end already being fixed to the holder 7. After said inserting, the sealing device 5 is locked around the material that surrounds the eye 3 and thus locked to the eye sling hook 1. The locking function is realized by a component within the holder 7, as will be discussed below.

[0028] The sealing device 5, in particular the holder 7 thereof, is provided with a marking sign "8" on a sticker, self-sticking or not, that is put, either without or with the separate application of glue, in a tamper proof manner on a surface 8 (see Figure 2C) of the holder 7. The marking sign "8" is sized sufficiently large to be clearly visible for the human eye, even without the aid of optical tools (other than normal glasses or lenses that persons may wear) such as microscopes or other magnifying aids. The marking sign "8" represents the year 2018, in this example, but may also represent other years or different time spans.

[0029] Where Figure 1b shows the situation at a first moment, Figure 1c shows the same eye sling hook 1, but at a second moment, approximately one year later than the first moment and immediately after re-inspection. The eye sling hook 1 was approved again after the inspection and in order to show this, a new marking sign "9" is glued over the old sign "8", to indicate that the eye sling hook 1 was inspected and approved for the year 2019, as part of a certification process.

[0030] Figure 1d shows again the same eye sling hook 1, but at a third moment, approximately one year later than the second moment and immediately after re-inspection. The eye sling hook 1 was approved again after the inspection and in order to show this, a new marking sign "0" is glued over the old signs "8" and "9", to indicate that the eye sling hook 1 was inspected and approved for the year 2020, as part of a certification process.

[0031] The actions resulting in the situations shown in Figures 1b, 1c and 1d are identical, apart from the marking signs used, and may be repeated more often and thus span several years more. Of course, if a time span longer than ten years is covered, it will be wise to use marking signs with double digits or another type of mark-

ing signs, that allow for more variety than single digits do.

[0032] Not visible in Figures 1a-1d, is the fact that the stickers holding the marking signs are glued within a boundary formed by a rim 9, or edge or rib or protrusion (see Figure 2C) that in this example coincides with the outer edge of the holder 7.

[0033] Also not shown in Figures 1a-1d is the presence of an RFID chip 10 (see Figures 2C and 3A) inside the holder 7, on which chip data are stored that represent information about the eye sling hook 1, such as ID, weight, max. allowed towing weight, year of creation, company name or ID of the producer, and also certification information such as the years for which the hook 1 was certified.

[0034] Figure 2A shows the sealing device 5 used in the method of Figures 1a-1d, the device 5 comprising a holder 7 of two components: holder housing 11a and sealing plate 11b, which are more clearly shown in Figures 2b and 2c. Inside the holder housing 11a, that is made of plastic and has an outside wall 13 and an inside wall 14, is a metal beam 12 provided with two openings 15 and 16. The beam 12 is surrounded by the inside wall 14 and thus kept in place within the holder 7 when the latter is in its assembled state, thus when the holder housing 11a and sealing plate 11b are mounted together.

[0035] One end of the cable 6 is inserted in the opening 16 of the beam 12 and fixed thereto in a conventional manner. The other end of the cable 6 fits within opening 15 of the beam 12 and is suited to be inserted in opening 15, which is a continuous opening through the entire beam 12. The beam 12 has one-way fixing means inside, not shown, that prevent the cable from being withdrawn again after insertion until beyond the one-way fixing means. The beam 12 is adapted for insertion at the same side as the fixed end of cable 6 is inserted, but a variant of the sealing device is suited for insertion the opposite direction. The beam 12 inside the holder 7 thus functions as a locking means.

[0036] At the outside of the holder 7, on its sealing plate 11b, the rim 9 discussed above is shown. The rim 9 surrounds and bounds a flat surface suitable for holding stickers. Since the surface is part of the outside of the holder 7, it requires no additional material and is relatively safe with respect to tampering or damage caused by handling during towing etc, this as opposed to a configuration wherein the surface for holding stickers would be in a lip or other attachment of the holder 7.

[0037] The RFID chip 10 lies between the bottom 16 of the holder housing 11a and the beam 12. The constitution and operation of RFID chips are known per se and will not be clarified here.

[0038] The sealing plate 11b is also made of plastic and fits on the holder housing 11a. After assembling these two components, they are welded together and thus form the holder 7 that is tamper proof. In an alternative variant, the holder housing 11a and sealing plate 11b are fixed together by means of a snap-on lock.

[0039] The stickers used as marking signs are made of plastic film in this example, but may instead be made of paper, wood, metal, and/or other materials suitable for the specific circumstances in which they are used.

[0040] Figure 3a shows the sealing device 7 with its components in a disassembled state, in an expanded view and Figures 3b shows the sealing device 7 in its assembled state. In Figure 3a the beam 12 is removed, for the sake of clarity.

[0041] Variants can be made to the embodiment shown, without leaving the scope of the claims. For example, the holder may be ball shaped, and the cable 6, which is a steel wire, may be a carbon wire.

Claims

1. Method of certifying objects, comprising the following subsequent steps of:

   (a) at a first moment locking to an object to be certified a sealing device comprising at least a holder with a cable attached thereto in a tamper proof manner, the locking being realized by fastening the cable to the holder to form a closed loop around at least part of the object, wherein the sealing device is provided with a marking sign attached thereto in a tamper proof manner,
   (b) at a next moment inspecting a state of the object and evaluating the obtained value of said state, and
   (c) subsequently installing a next marking sign on or at the sealing device in a tamper proof manner only if the evaluation yielded a confirmation that said state of the object meets predefined state requirements, which next marking sign is visually different from any marking sign already present on the sealing device.

2. Method of certifying objects according to claim 1, wherein the steps (a)-(c) are followed by a single or multiple repetition of the steps (b) and (c).

3. Method of certifying objects according to claim 1 or claim 2, wherein the marking signs are installed on the holder.

4. Method of certifying objects according to claim 3, wherein the marking signs comprise stickers.

5. Method of certifying objects according to any one of the preceding claims, wherein the next marking sign is provided over the marking sign(s) already present in order to withdraw the latter sign(s) from eyesight.

6. Method of certifying objects according to any one of the preceding claims, wherein each marking sign is an instance of a predetermined type, wherein each such a type of marking sign represents a time span

during which the certification is valid.

7. Method of certifying objects according to any one of the preceding claims, wherein remotely readable data storage means irremovably present in or at the tamper proof holder are provided with information about the object to be certified.

8. Sealing device, comprising
a holder,
a cable that is fixed in a tamper proof manner to the holder at a distance to a first end thereof, and
in which sealing device the holder is provided with locking means, which locking means comprise an opening into which the cable is insertable by said first end thereof to form a closed loop, and
the locking means are arranged to prevent that the cable can be moved in the direction opposite to the insertion direction within the locking means, once the cable has been inserted into the locking means over at least a predetermined distance, and
the holder is, at the outside thereof, provided with at least a surface bounded by a raised rim.

9. Sealing device according to claim 8, wherein the surface surrounded by the raised rim is part of the outside surface of the holder.

10. Sealing device according to claim 8 or claim 9, wherein the holder comprises electromagnetically readable identification means.

11. Sealing device according to claim 10, wherein the electromagnetically readable identification means comprise an RFID transponder.

12. Sealing device according to any one of the claims 8-11, wherein the holder comprises two parts that after assembly are mutually fixed by means of a one-way fastener to be opened only by visibly damaging at least one of the two parts.

13. Sealing device according to any one of the preceding claims 8-12, wherein the locking means are provided with a continuous opening, in which opening the cable can be advanced in the direction of insertion in order to provide the closed loop with a variable length.

14. Certification system, comprising a sealing device according to any one of the claims 8-13, and at least two different marking signs, wherein each of the marking signs fits neatly within the raised rim of the sealing device.

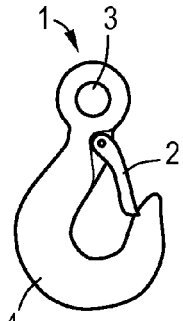

Fig.1A

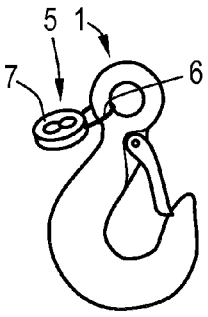

Fig.1B

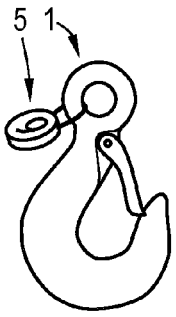

Fig.1C

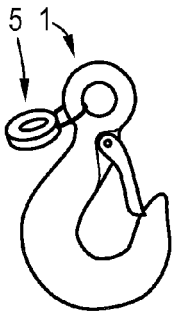

Fig.1D

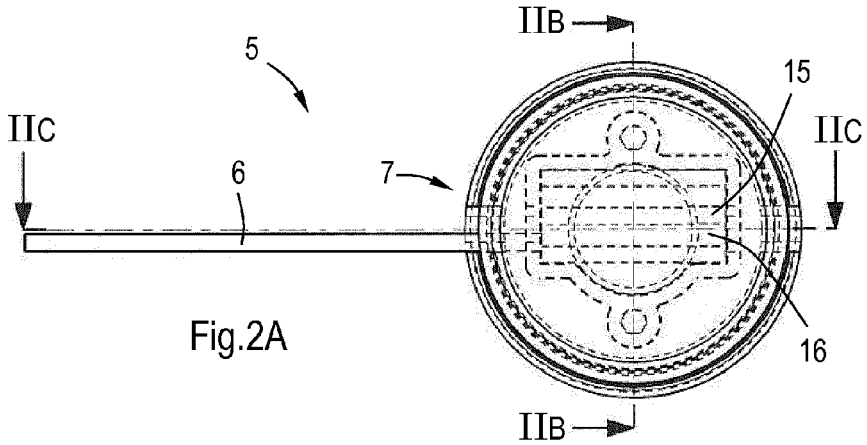

Fig.2A

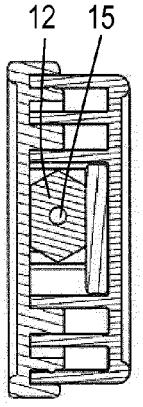

Fig.2B

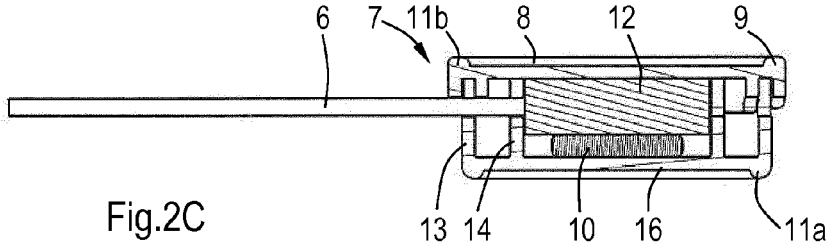

Fig.2C

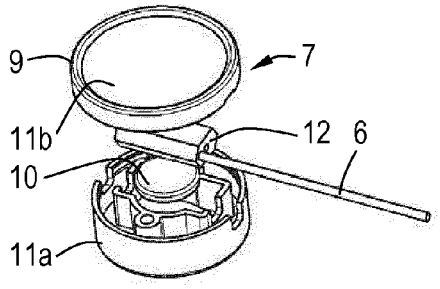

Fig.3A

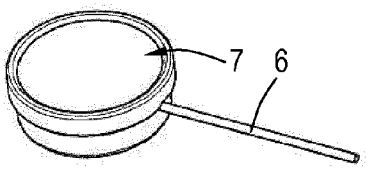

Fig.3B

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EUROPEAN SEARCH REPORT

Application Number
EP 13 17 9285

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2008/034059 A2 (BRAMMALL INC [US]; LITTRELL PAUL A [US]; BEARD WANDA K [US]; GILBERT D) 20 March 2008 (2008-03-20)	8-14	INV. G09F3/00 G09F3/03
A	* the whole document *	1-7	

TECHNICAL FIELDS SEARCHED (IPC)

G09F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	13 September 2013	Demoor, Kristoffel

CATEGORY OF CITED DOCUMENTS

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13-09-2013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2008034059 A2	20-03-2008	US 2008066359 A1	20-03-2008
		WO 2008034059 A2	20-03-2008

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