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(54) **Security system for portable devices and portable devices provided with such security system**

(57) A fixing device is provided suitable to be applied on a movable article, particularly a portable electronic device, such as a laptop, notebook etc., which article has a wall (3) provided with a security slot. The fixing device comprises two locking elements, which together can lock the fixing device detachably in the security slot, and each of them consists of a flat basic body (1,2) provided with an opening (6,7), and with a protruding connecting part

and a therewith connected coupling part, that is perpendicular to the connecting part; a bolting device (5), that essentially consists of two parallel planes, connected with a distance to each other, whereby both planes are provided with an opening and whereby the bolting device can be applied over both combined basic-bodies, whereby the openings of the bolting device and the basic-bodies are aligned, so that through these openings an attachment cable (4) or padlock etc. can be applied.

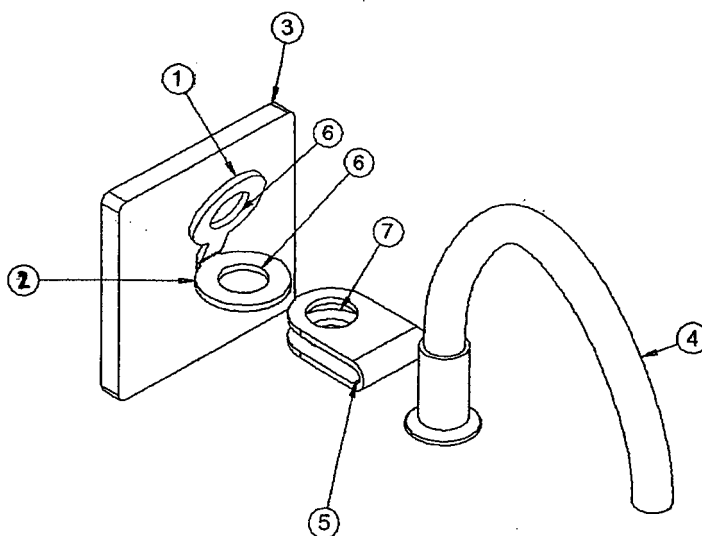


Fig. 6

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Description

[0001] The present invention relates to a security system for movable apparatus as well as movable apparatus that have been provided with such a security system. More in particular, the invention is concerned with an improved fixing-device, which is suitable to be applied to any portable articles, in particular portable electronic apparatus, such as: notebooks, plasma screens and TFT-screens (flat screens), where these apparatus can be fastened to a table or a wall, or the like, through a chain, cable or similar fastening means to protect against unlawful or undesirable removal.

[0002] Fixing devices to fix or anchor portable or easily movable apparatus through connecting means are already known. Such fixing devices are usually connected on the one side to the apparatus concerned and on the other side with a chain or cable, whereby the apparatus is finally fixed.

[0003] For the connection of a movable piece of apparatus with a fixing-device, use is often made of a standard opening or slot-hole in the wall of the apparatus, also called a "security slot". A well known design of a similar slot-hole is the so called "Kensington Slot" on portable computers and related equipment such as: plasma screens and flat screens. The wall is, in many cases, made out of plastic, which may or may not be reinforced with a metal plate around the slot. The fixing-device is introduced into this slot-hole and then bolted detachable.

[0004] There are several known ways on which the bolting can be carried out. In one of the two main ways the fixing-device is provided with a spindle, which has a T-formed transverse element at the end. This spindle is entered into the slot-hole, then twisted 90 degrees and bolted. See for example US 6,735,990, EP-A-0 791 123 and EP-A-1 028 212, and the German Offenlegungsschrift nr. 199 15 959. In the other main form the fixing-device is provided with one or more outside extending elements that include a transverse element, or catch at the end. By attaching the fixing-device the outside extending elements which are put in the slot-hole and are then manipulated in such a way that the transverse element or the transverse elements or the catch or catches by their protruding part or parts hold the fixing-device in the slot-hole, whereupon this can be bolted. The transverse element or catch providing the protruding elements are often applied in pairs. When inserted the ends of these elements can move away from each other (for example in a scissors movement), so that the respectively transverse elements or stops prevent the fixing-device from being pulled out from the slot-hole. See for example WO 02143586 and US 5,983,679; see further US 5,983,679.

[0005] In the above-described cases, when the fixing-device is bolted into the slot-hole, it rests mostly only a small part of the walls of the slot-hole. In the case of a spindle on a part of the long sides and in the case of transverse elements mostly on the short sides, then the risk exists that the slot-hole rips out already under the

strain of a small pulling force. Because the slot-hole is relatively small, the mechanical construction of the fixing-device is generally light and weak in design.

[0006] For this reason there is a need for a fixing-device for a slot-hole more robust and more strongly constructed than any fixing-device currently available.

[0007] It was found that this could be achieved by providing a fixing-device that is suitable to be applied to a movable article, which article has a wall fitted with a standardised, rectangular "security slot", where the fixing-device mainly consists of:

- Two actual uniform locking elements, which together can bolt the fixing-device detachable in the security slot, whereby each locking element comprises:
 - a flat basic body containing an opening
 - a connection part extending from the basic-body, in the same plane, which has such a width that it can be introduced into the security slot, and
 - a to the basic body distant end of the connection part attached linking part which, in fact, has the same width as the connection part to be introduced into the security slot, which linking part stands perpendicular on the basic-body and the connection part;
- a bolting body, which in fact consists of two parallel planes linked to each other within a distance, where both planes are provided with an opening and whereby the bolting body is configured in such a way that it can be applied close-fitting over the both on top of each laying basic bodies, whereby the opening of the bolting body and basic-bodies lie in one line; where the respective connection parts of the two locking elements have a total thickness, which is just a bit smaller than the shortest side of the security slot.

[0008] Where the two locking elements have been positioned in such a way, after introduction into the security slot, that the respective basic bodies and the respective connection parts lie on each other, where the respective openings of the two basic bodies lie in one line, and that the respective connective parts and respective coupling parts both stick together in the security slot, where the two connective parts are in fact perpendicular to the wall of the security slot and both coupling parts are positioned in opposite direction and in fact parallel to the wall; and where the bolting body, after applying over both basic bodies of the 'in the security slot applied locking elements' ensures that the locking elements are being bolted in the security slot.

[0009] In a preferred design, according to the invention, the two locking elements and the bolting body are made of a rigid and relatively thick material, preferably steel with a thickness of at least 1 to 1.5 mm. It is advantageous, if the bolting body still has a somewhat larger thickness, for example 2 mm. The design of the fixing-device, according to the invention, makes it possible to use maximum advantage of the mechanical strength of the security slot. By the above-mentioned thickness of the

components of the fixing-device, the chance of damage and/or bending of these components and particularly the connection part and the coupling part are small and in any case smaller than systems known so far.

[0010] To the fixing-device, according to the invention, after the locking elements have been introduced into the security slot and after that the bolting body is applied over the two basic-bodies, preferably a cable, chain or padlock is put through the in-line positioned holes of the locking elements and the bolting body, with which the fixing-device has been on one side bolted with the movable article and on the other side by the applied cable, chain and/or padlock is coupled to a fixed point in the surroundings, such as a table leg or to a partition or wall-attached eye etc.

[0011] It is advantageous, if the cable, chain or padlock are put in a close-fitting manner through the in-line openings of the locking elements and the bolting body of the fixing-device, because of this forcing of the construction is hampered. According to the invention, it is possible to design the fixing-device in a relatively robust format, as a result of which also the opening in the base body of the two locking elements, as well as the two openings of the bolting body, have a cross section in the order of 6-12 mm and even greater. Because of this it is possible to affirm the fixing-device to a thick cable or heavy padlock, as a result of which the resistance against destruction is considerably greater than with systems well-known so far.

[0012] For the same reason it deserves the preference that both the locking elements have such dimensions, that they can be applied closely-fitting in the circumference of the security slot. This applies both to the width of the respectively connection parts and coupling parts of the two locking elements, and for the common cross-section of particularly the two connection parts. Also it is advantageous, if the connection parts of the locking elements are short, for example just something longer than the thickness of the wall of the security slot.

[0013] The invention can be in principle applied to every movable article which has the availability of a wall, in which a security slot is present. A particular preference however, is the application upon movable apparatus and in particular portable electronic apparatus with a relatively high value, such as laptops, notebooks, plasma screens, TFT-screens and flat screen TV's.

[0014] According to another aspect of this invention it also applies to every security system for movable apparatus, where this security system includes a fixing-device, defined as above.

[0015] The invention is related further to every movable article, which is provided with a security system, like above.

[0016] The invention is now further illustrated by means of the following drawings, in which:

the figures 1A and 1B are schematic cross-sections showing a fixing-device according to the invention in

an assembled state, respectively provided with a connection cable and a padlock;

Figure 2 reflects a wall of a (movable) apparatus, with a "security slot" in it;

Figure 3 is a locking element of a fixing-device according to the invention is

Figures 4 to 7 reflect schematically several stages of the assembly of a fixing-device according to the invention to a wall with a "security slot".

[0017] In the various figures equal reference figures have always the same meaning.

[0018] In Figures 1A and 1B a fixing-device is shown, according to the invention, being assembled in a wall 3 with a security slot 9 (see also Fig. 2). The fixing-device consists of two, in fact, uniform locking elements 10 (see also Fig. 3), which each consist of a basic body 1, 2, with an opening 6, a connection part 11 and a coupling part 12, 13 (the respective basic bodies and coupling parts are, although in principle identical referring to several corresponding figures, to be able to distinguish them in description), as well as a bolting body 5. The bolting body 5 has always been represented in the figures as a U-shaped body, within the two parallel planes, located at a distance from each other is an opening 7. The distance between the two main areas has been chosen this way by preference, so that the U-shaped body 5 is introduced close-fitting over the "on top of each other" lying basic bodies 1, 2, were applied, whereby the four holes 6, 7 are brought into line with each other, so that as a result for example a cable 4 or a padlock 8 can be applied, where the bolting device 5 is tightly connected with both the basic-bodies 1, 2 and the locking elements via the security slot 9 in the wall 3 is bolted.

[0019] The cable 4 can be continuous or not and can have a thickened end piece 9, that is designed in such a way that it cannot be pulled through the openings 6, 7. On the padlock 8, which on the one side can be applied through the holes 6, 7, (see fig 1 B) there can furthermore be attached a chain or a cable loop, visualised here schematically with an indicating number 15, with which it can be affixed through the fixing device according to the invention to a locked moveable article.

[0020] It will be clear to an expert that the bolting element 5 also can have a different shape than the U-shape shown here. Similar modifications are also contained in the total of the present invention.

[0021] Figures 4 to 7 show schematically how the fixing-device according to the invention can be mounted in a simple way to the wall with a security slot. Firstly, a locking element 10, with the connection part 11 and a coupling part 13 brought oblique into the security slot 9 (see Fig.4), whereby the coupling part 13 is pointed downwards. After the coupling part 13 is inserted into the security slot 9, the basic body 2 is brought into a position perpendicular on the wall (see Fig 5), whereby the locking device is resting on the bottom of the security slot.

[0022] Next the second locking element 10 is inserted

with connection part **11** and coupling part **12** oblique in the security slot **9** (see Fig 6), whereby the couplings part **12** is pointing upwards. Looking at the preference to execute the whole construction as close fittingly as possible, it may be necessary to apply a little force to put the second locking element into place. This is however, no obstruction for the construction of this invention. After the coupling part **12** is inserted into security slot **9** the basic body **1** is positioned perpendicular to the wall (see Fig. 7), whereby this second locking device concerning the basic body and the connection part on one side mainly rests on the first locking device and on the other side preferably also rests against the upper side of the security slot **9**. Finally, over either side, of the "on top of each other laying basis bodies **1, 2**" the bolting device **5** is pushed, whereby the openings **6, 7** are brought into line allowing a cable **4** or a padlock **8** etc. to be attached. The assembly of the fixing-device according to the invention is herewith completed.

[0023] It will be clear for a person skilled in the art that modifications and adjustments for the requested described security system can be applied, without there being a deviation to the essence of the invention. It is for example thinkable, that the dimensions of the parts of the locking-device can be adjusted in such a way that the respective connection parts and coupling parts can make use of the short sides of the security slot in place of the long sides, as described and shown. Also it is thinkable, that the basic body and the connection part of the locking element are not in the same plane, whereby the basic body for example may be turned 90 degrees in respect of the described and shown model. Furthermore a security slot with a greater width, as well as locking elements with a smaller thickness, can be supplied, whereby the extra space is being filled with an extra filling plate, which in fact also has a locking element, a basic-body and a connection part but has no coupling part. That is why such and similar modifications and further adjustments are also included in this invention.

Claims

1. A fixing device, suitable to be applied to a movable article, said article having a wall comprising a standardized rectangular "security slot", wherein said fixing device essentially comprises:

- two essentially uniform locking elements, which together are capable of locking said fixing device detachable in the security slot, each locking element comprising:
- a flat basic body provided with an opening hole.
- a connecting element extending from the basic body in the same plane having a width such that it can be inserted into the security slot, and
- a coupling element having essentially the same width as the connecting part to be inserted into

the security slot with the basic body distant end of the connecting part connected, said coupling elements are essentially perpendicular to the basic body and the connecting element,

- bolting means, that, essentially, consists of two parallel planes and connected to each other with a distance, whereby both planes have an opening and whereby the bolting device is configured in such a way that it can be applied closely fitting over the "on top of each other laying basic bodies", whereby the openings of the bolting device and the basic bodies are in one line;

Whereby the respective connecting parts of the two locking elements have a total cross-section that is just a bit smaller than the shortest side of the security slot;

whereby both the locking elements after inserting it into the security slot are positioned in such a way that the respective basic bodies and the respective connecting parts lay upon each other, whereby the respective openings of both the basic bodies are in one line, and the respective connecting parts and the respective coupling parts are inserted together into the security slot, whereby both connecting parts are essentially perpendicular to the wall of the security slot and both the coupling parts are in opposite direction essentially parallel to the wall; and

Whereby the bolting device after applying it over both basic bodies of the "in the security slot" applied locking elements maintain, that the locking elements are locked in the security slot.

2. Fixing device according to claim 1, whereby both locking elements and the bolting device are made from rigid and relatively thick material.

3. Fixing device according to claim 1 or 2 whereby a cable, chain or padlock is applied through the aligned openings of the locking elements and the bolting device.

4. Fixing device according to claim 3, whereby a cable, chain or padlock is brought through the close-fitting aligned opening of the locking elements and the bolting device

5. Fixing device according to any one of the previous claims, whereby both locking elements have such dimensions, that they are applied close-fittingly with the circumference of the security slot.

6. Fixing device according to one of the previous conclusions, whereby the movable article is an electronic device.

7. Fixing device according to conclusion 6, whereby the electronic device is a laptop, notebook, plasma

screen, TFT-screen or a flat screen TV.

8. Security system for movable apparatus, with the mark, that this is a fixing device, such as defined in one of the conclusions 1 to 7.

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9. Movable article, with the mark, that it is provided with a security system, such as defined in conclusion 8.

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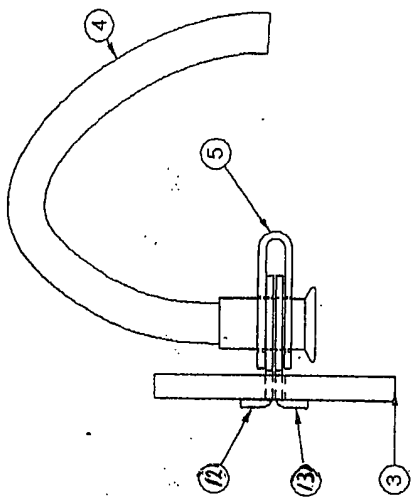


Fig. 1A

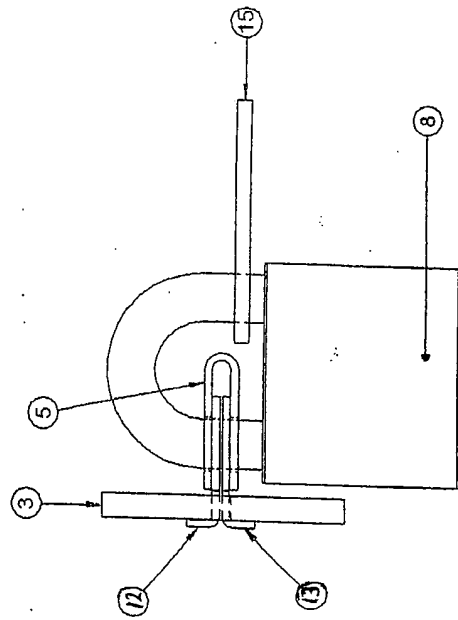


Fig. 1B

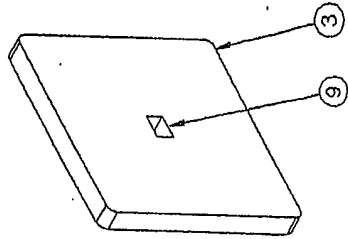


Fig. 2

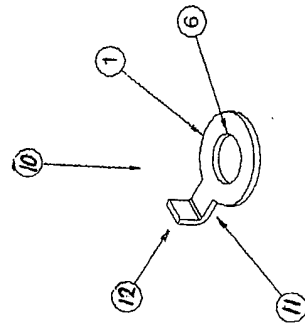


Fig. 3

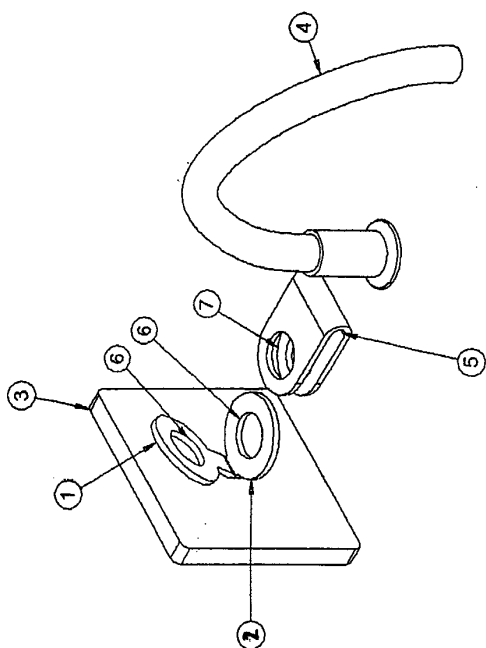


Fig. 6

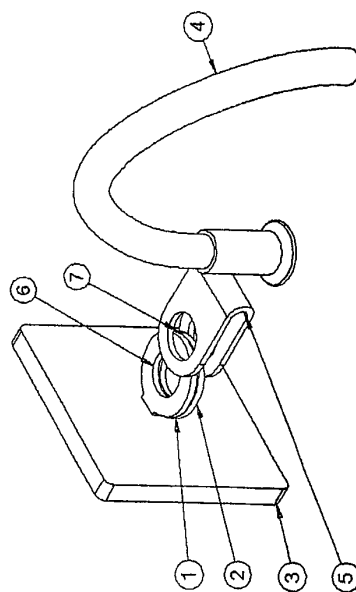


Fig. 7

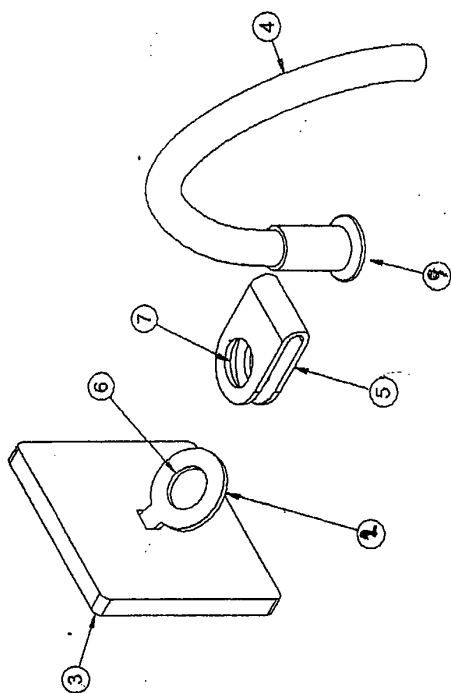


Fig. 4

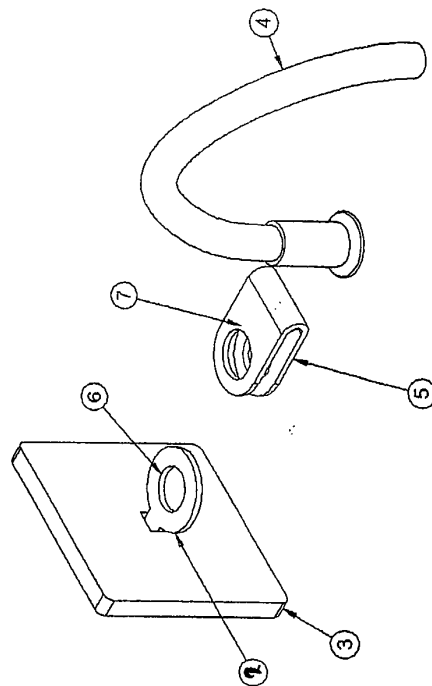


Fig. 5



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 05 07 6904

DOCUMENTS CONSIDERED TO BE RELEVANT			
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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 12 December 2005	Examiner Henkes, R
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 05 07 6904

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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