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(54) **Self-locking device, for example a nut**

(57) A self-locking device for preventing a nut etc (2) from loosening when fitted on a bolt etc (1) comprises an opening (5) in the wall of the nut, a locking coil (3) wound around the thread of the bolt and having at both its ends bent portions (3*a*, 3*b*) which can be selectively engaged with the opposite sides of the opening (5) and a member (4) which is rotatably fitted on the nut and has an inner projection 40 which, when it is rotated, engages one or other of the projections 3*a*, 3*b* to loosen the coil and permit the nut to rotate.

FIG.1

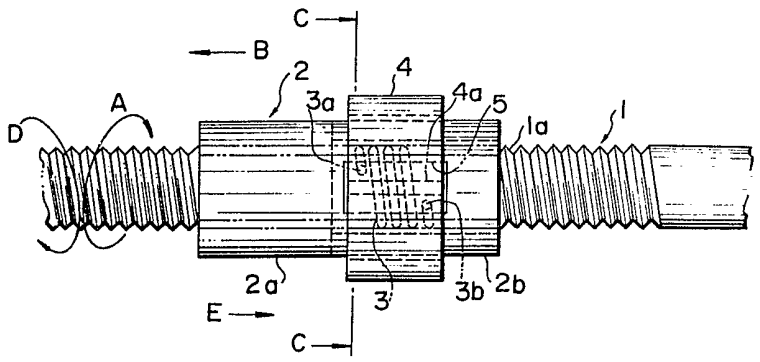

FIG. 2

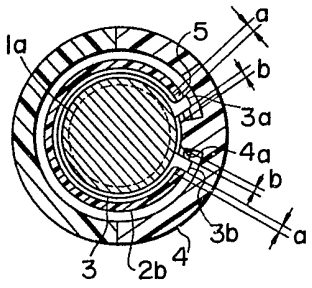

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FIG. 1

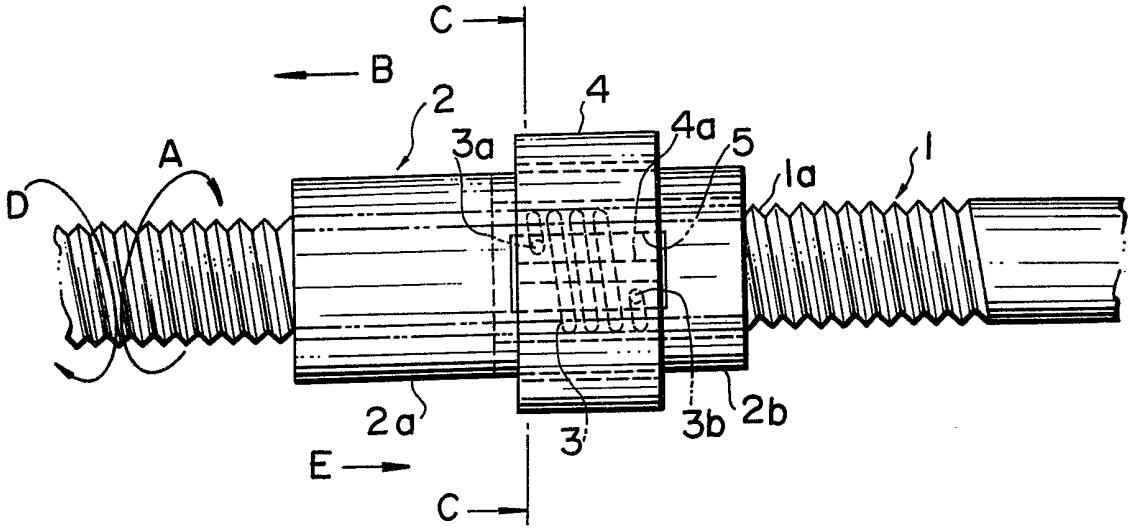
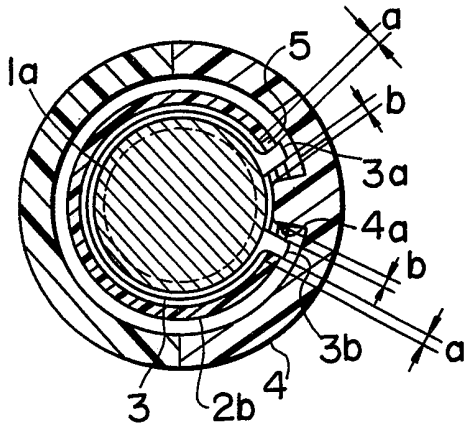


FIG. 2



SPECIFICATION

Self-locking device, for example a nut

This invention relates to a self-locking device for preventing a nut (or equivalent threaded-member) from becoming loose on a bolt or equivalent member.

To prevent a nut from loosening it is known to use a second or additional nut. After the two nuts are set at a predetermined position by a fitting tool, one is fixed while the other is further clamped so as to prevent the nuts from loosening. Such an operation is cumbersome.

An object of the present invention is to overcome that problem by providing a control device which is easily operated to prevent a nut from loosening.

The present invention provides a self-locking device for preventing a nut from loosening, comprising a first member having an external thread portion, a second member having an internal thread portion mating with the external thread portion and having an opening; a locking coil which is wound round the external thread portion of the first member and has at each end a respective bent portion which is engageable with a respective one of two opposite side edges of the opening of the second member; and a third member which is rotatably fitted on the second member and is selectively engageable with one or other of the bent portions of the locking coil.

The present invention also provides a self-locking device comprising an internally threaded member, a coiled spring and another member rotatably mounted on the threaded member, wherein the ends of the spring are bent outwardly and are received in an opening in the threaded member and the said other member has means for engaging those ends through the opening, the threaded member being engageable with the threads on a bolt or like-threaded element, the spring being coiled to co-operate with those threads to lock the threaded member in position, and being movable along the bolt by turning the said other member so that the said means engage one of the ends of the spring to loosen the grip of the spring on the threads.

A nut-locking device constructed in accordance with the present invention will now be described, by way of example only, with reference to the accompanying drawings, in which:—

Fig. 1 is a side view of the device.

Fig. 2 is a section taken along the line C—C in Fig. 1.

Referring to the accompanying drawing, a first member in the form of a bolt 1 has an external thread portion 1*a*. A second member in the form of a nut 2 has an internal thread portion 2*a* screwed with the external thread portion 1*a*, and a collar portion 2*b* having a bigger inner diameter than the outer diameter of the external thread portion 1*a*. A locking coil 3 has at its ends bent portions 3*a*, 3*b* which engage with respective side edges of a rectangular opening 5 of the nut 2, the side edges extending along the length of the bolt 1. The locking coil 3 is wound around the external thread portion 1*a* at the same pitch. The inner diameter and thickness of the locking coil 3 are so determined that a predetermined tension and clamping force of the locking coil 3 can be exerted against the external thread portion 1*a*. A third member in the form of a ring 4 has a bigger inner diameter than an outer diameter of the nut 2. The ring 4 has a projection 4*a* protruding inwardly which is to be selectively engaged with the one or other of the side edges of the opening 5 and is placed between the bent portions 3*a* and 3*b*. The projection 4*a* engages one or other of the bent portions 3*a*, 3*b* when the ring 4 is rotated. A clearance *a* is initially set between both sides of the opening 5 of the nut 2 and the bent portions 3*a*, 3*b* of the locking coil 3. Also a clearance *b* is initially set between the projection 4*a* of the ring 4 and the bent portions 3*a*, 3*b* of the locking coil.

In the above structure, when the ring 4 is rotated in the direction A in Fig. 1 by hand and without any tools, the bent portion 3*a* of the locking coil 3 comes into engagement with the projection 4*a* of the ring 4. The diameter of the locking coil 3 is therefore increased and the coil is loosened from the external thread portion 1*a* so that the ring 4 can be easily rotated and, thereby, axially moved in the direction B in Fig. 1 together with the nut 2. When the nut 2 has been brought, in this way, to a predetermined position on the bolt 1, hand pressure on the ring 4 is removed and the locking coil 3 contracts into engagement with the external thread portion 1*a*. Consequently, the nut 2 cannot rotate and is, therefore, prevented from loosening.

If the ring 4 is rotated by hand in the direction D the projection 4*a* of the ring 4 comes into engagement with the bent portion 3*b* of the locking coil 3. Consequently, the nut 2 is rotated and moved in the direction E together with the ring 4 and can be locked in a pre-selected position on the bolt 1 — in the same way as described above — by removing hand pressure from the ring 4, so that the coil 3 contracts into engagement with the bolt 1.

It will be evident, therefore, that the nut 2 can be easily moved and prevented from loosening, merely by rotating and axially moving the member 4 together with the nut to a predetermined axial position.

CLAIMS

1. A self-locking device for preventing a nut from loosening, comprising a first member having an external thread portion; a second member having an internal thread portion mating with the external thread portion and having an opening; a locking coil which is wound round the external thread portion of the first member and has at each end a respective bent portion which is engageable with a respective one of two opposite side edges of the opening of the second member; and a third member which is rotatably fitted on the second member and is selectively engageable with one or other of the bent portions of the locking coil.

2. A device as claimed in Claim 1, in which the third member has a projection loosely fitted in the opening of the second member which projection is selectively engageable with one or other of the bent portions of the locking coil.

3. A device as claimed in Claim 2, wherein the opening of the second member is a rectangular aperture with its longer edges parallel to the axes of the threaded portions, and the bent portions of the locking coils and the projection of the third member are placed within the rectangular aperture in such a manner that a clearance can be set between the longer edges of the rectangular aperture and the bent portions of the locking coil, the projection of the third member being arranged between the bent portions of the locking coil.

4. A device as claimed in any one of Claims 1 to 3, wherein the second member is a nut having a collar portion which portion has a bigger inner diameter than the outer diameter of the external thread portion of the first member.

5. A self-locking device substantially as hereinbefore described with reference to, and as shown in Figs. 1 and 2 of the accompanying drawing.

6. A self-locking device comprising an internally threaded member, a coiled spring and another member rotatably mounted on the threaded member, wherein the ends of the spring are bent outwardly and are received in an opening in the threaded member and the said other member has means for engaging those ends through the opening, the threaded member being engageable with the threads on a bolt or like-threaded element, the spring being coiled to co-operate with those threads to lock the threaded member in position, and being movable along the bolt by turning the said other member so that the said means engage one of the ends of the spring to loosen the grip of the spring on the threads.

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