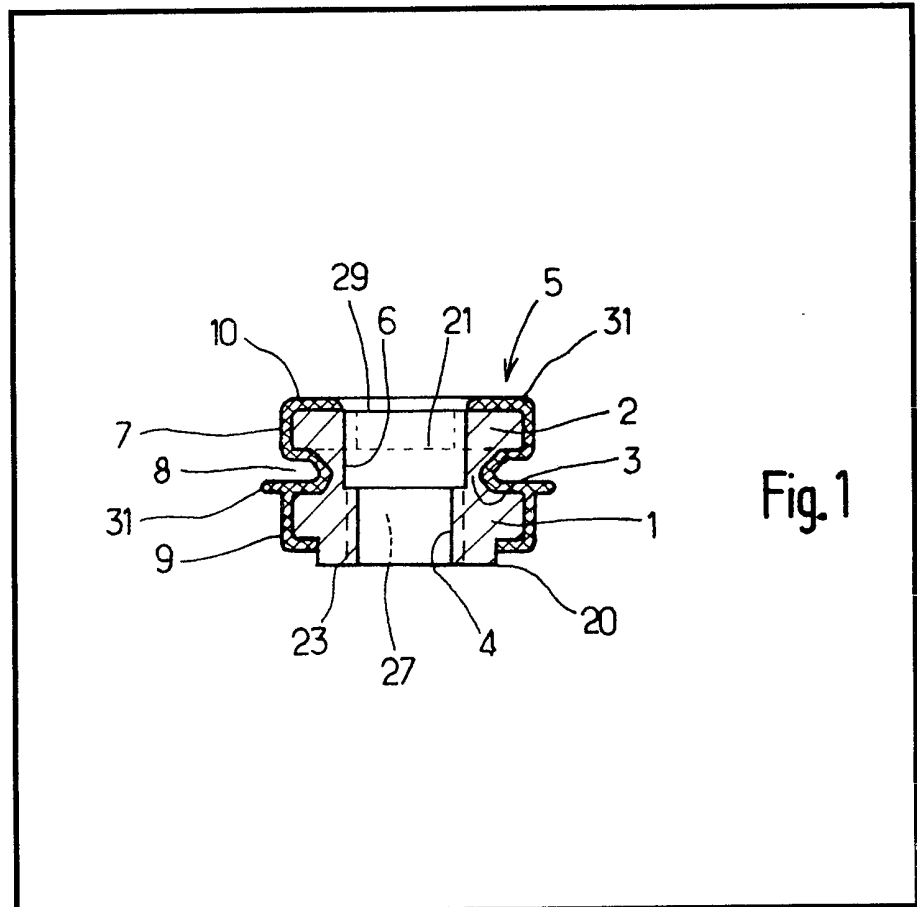


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- (71) Applicant
La Telemecanique
Electrique
33 bis
Avenue du Maréchal
Joffre
92000 Nanterre
France
- (72) Inventor
Pierre Roubault
- (74) Agents
J M Halstead

(54) Insulated shearable nut

(57) A metallic nut 5, of the kind which provides automatic limitation of the tension to which it can be tightened, includes a first portion 1 with internal threading 4 coupled by an annular shearing zone 3, having a cross section which is small relative to the useful cross section of the nut, to a coaxial second portion 2 having a non-threaded internal bore 6, and flats 21 for cooperating with a tightening tool, a continuous electrically-insulating casing 31 extending externally from the first portion 1 to the second portion 2. The casing 31 is adherent to the two portions 1, 2 and may retain them adjacent to each other after they have been separated by shearing; alternatively the casing is broken or sheared at an annular zone thereof. The internal

bore 6 may have internal flats, or the flats 21 may project beyond the casing 31.



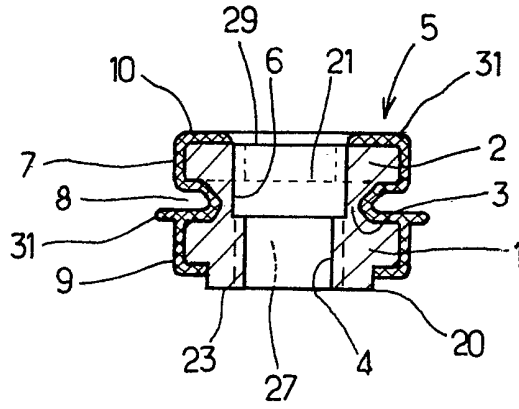


Fig. 1

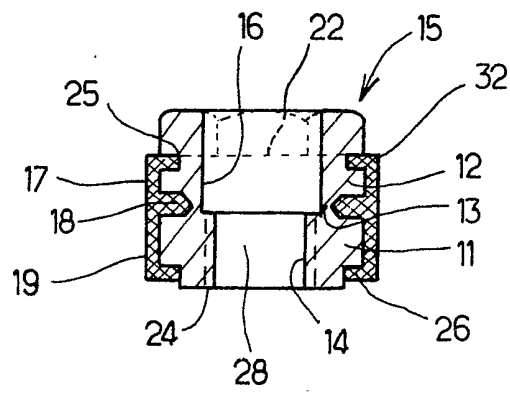


Fig. 2

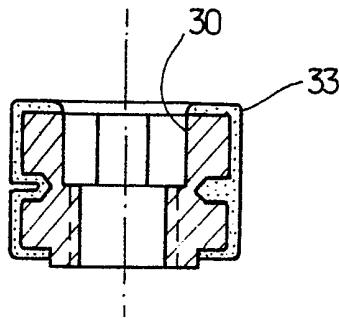


Fig. 3

SPECIFICATION

Nut with limitation of tension

5 The invention relates to a metallic nut with limitation of tension of tightening, in which a first portion comprising an internal thread is coupled by an annular zone having a small section in relation to the useful section of the

10 nut, to a second coaxial portion comprising a non-threaded internal housing and surfaces for cooperating with a tightening tool.

Such a nut has certain inconveniences when it is desired to apply it to electrical

15 apparatus, for example for carrying out a carefully defined tightening operation for the purpose of obtaining a good electrical contact on bus bars.

When such nuts are used, the non-threaded

20 portion which detaches itself by shearing from a zone which has already been weakened in advance can escape from the tightening tool, fall into inaccessible places where there are electrically live members, and cause short

25 circuits at the moment of putting into operation.

This happening is all the more to be feared if use of these nuts is made on a work site by a non-specialist person who may not be aware

30 of the dangers of such a situation. Furthermore, the fact that electrical cabinets are delivered in separate pieces in order to satisfy certain particular requirements, requires the putting into use of simple measures or components which permit the assemblers to guarantee the quality of their work, and preferably without having to call upon specialised tools such as dynamometric wrenches. Finally, it is

35 generally desired to be able to control whether attempts at unfastening or refastening have been subsequently made on these nuts.

The invention accordingly proposes to provide a nut with limitation of tightening tension which does not have the defects indicated

45 above, or reduces them to a great extent, and consequently aims at obtaining in a simple manner a tightening means which does not require for its use the special attention of the operator, and while benefiting from the advantages of the prior art.

According to the invention, this result is obtained by reason of the fact that a continuous insulating casing extends externally from the first portion to the second portion, and

55 that this insulating casing adheres on the one hand to the two portions in such a manner as to keep them one near the other after their separation, and on the other hand to have a thickness which is sufficiently small to be

60 broken or sheared at the level of the said annular zone.

The invention will be better understood from reading the description given below which sets out two methods of construction

65 within its scope and which is illustrated by:

Figure 1 which shows a first method of construction,

Figure 2 which illustrates a second method of construction, and

70 *Figure 3* which shows a variation of the means of cooperation with a tightening tool applicable to the two methods of construction.

A metallic nut 5 visible in Fig. 1 comprises principally a first portion 1 comprising a

75 threaded bore 4, a second portion 2 concentric to the first portion comprising a non-threaded internal housing 6 the diameter of which is greater than the diameter of the screw (not shown) which will receive the

80 threaded portion, and a zone 3 which couples the two portions. By reason of the presence of an external throat 8, the section of annular shape of the zone 3 is small in comparison with the useful section of the first portion.

85 When a predetermined tightening couple is applied to the second portion, the zone 3 will be sheared by the torque forces.

The external surface of the nut is covered with a casing 31 of insulating plastics material

90 of small thickness which extends from the first portion to the second portion whilst following the contour of the throat 8. This casing, which can be moulded on, or put into place by making use of a thermo-shrinkable material, adheres to the two portions in any appropriate manner. In the example illustrated, the lower surface 9 of the casing follows an annular frontal surface created by a reduction of the external diameter 20 terminating at the

100 bearing face 23 of the nut, whilst the upper surface of the casing extends at 10 as far as the surface 29 remote from the bearing face 23. Flats such as 21 forming, for example, a prism with hexagonal base, can have been

105 placed on the second portion to permit the carrying out of tightening with the aid of a flat key.

The casing 31 which follows the external shapes of this portion and thus of the flats will therefore permit the coupling between a key and the said flats, admittedly with a certain amount of crushing of the material of the casing. An annular rim 31 can moreover serve for pressure by the key in an axial direction.

115 When the second portion separates itself from the first portion, two situations can arise:—in a first case, the operator has not been able to control the movement of the key at the moment of rupture, and the force which he still exerts at this moment also causes the shearing or tearing of the casing 31 at the region of the throat 8; if the second portion then escapes from the key and becomes lodged in an inaccessible spot, its presence is

120 made practically inoffensive by reason of the insulating properties of the casing which surrounds it.

—in a second case, the operator has been able to control his movement and if no particular reason would justify the removal of the

130

second portion, such as for example the taking up of space, the latter remains supported by the upper part 7 of the casing and consequently cannot stray into an inaccessible part of the installation.

5 As it is desirable to ascertain if the screw has not been manipulated after a first tightening, an examination of the lower surface 9 of the casing will permit to ascertain whether or not a tool has exerted a couple thereon for driving the external surface 27 of the second portion.

10 In a second method of construction visible in Fig. 2, a nut 15 has a first portion 11 and a second portion 12 separated by a zone 13 of reduced section. Here again, a threaded bore 14 passes through the first portion, whilst a housing 16 occupies the interior of the second portion.

15 The external surface of the second portion now has external flats 22, and an annular throat 25 adjacent to the recess 18 which is analogous to the preceding throat 8. The insulating casing 32 which extends from the said throat to the lower frontal surface 26 entirely fills the recess 18.

20 As a result, if an involuntary force was exerted on the casing, this latter would be less liable to tear, and the second portion would remain in place. A subsequent operation would then certainly permit the rupturing or shearing of the casing at the region 18, if particular reasons justified it.

25 In a variation which is visible in Fig. 3, wherein the lefthand half corresponds to a nut of the first type, whilst the righthand half corresponds to a nut of the second type, the internal housing 30 has been shaped so as to have internal flats permitting the use of a prismatic key having for example a hexagonal section. In this construction, the casing 33 can enclose substantially the whole of the external surfaces of the second portion, irrespective of its manner of use.

45

CLAIMS

1. A metallic nut with limitation of tightening tension, of the kind having a first portion, with an internal threading, coupled by an annular zone, having a section which is small with respect to the useful section of the nut, to a coaxial second portion having a non-threaded internal housing and surfaces for cooperating with a tightening tool, characterised in that a continuous insulating casing extends externally from the first portion to the second portion, and that said insulating casing is adherent to the two portions so as to retain them adjacent to each other after their division, and said casing has a thickness which is small enough to enable it to be broken or sheared at an annular zone thereof.

2. A metallic nut, as claimed in claim 1, wherein the casing conforms to an external throat, which separates the two portions, to

said annular zone, and covers flats on the second portion.

3. A metallic nut, as claimed in claim 1, wherein the casing entirely fills a first throat separating the two portions, and enters a second throat formed in the second portion but without covering flats on the second portion.

4. A metallic nut, as claimed in claim 1, wherein the internal housing of the second portion comprises flats adapted to cooperate with a tightening tool.

5. A metallic nut with limitation of tightening tension substantially as described herein with reference to Fig. 1 or Fig. or Fig. 3 of the accompanying drawing.

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