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(54) **Shaped gripping or supporting element and method for producing said shaped element.**

(57) A shaped gripping or supporting element (1; 100) comprising a shaped tubular body (2; 101) provided with ends (2a, 2b) connected to a supporting structure (S), supporting elements (3, 4) applied to the supporting structure (S) by means of first fastening means (5) which protrude from the outer surface (S_e) of the supporting structure (S), shaped inserts (6, 7; 102) inserted at the ends (2a, 2b) of the tubular body (2; 101) coupled to the supporting elements (3, 4) when the tubular body (2; 101)

is positioned adjacent to the supporting structure (S) and second fastening means (8; 114) which connect in a stable manner the tubular body (2; 101) and the supporting element (3, 4). The shaped element (1; 100) comprises third fastening means consisting of the drawn-in edge (9; 106) of first through holes (10, 11; 111, 112) obtained in the tubular body (2; 101), the drawn-in edge (9; 106) extending towards the inner surface (12a, 13a) of radial housings (12, 13; 103, 104) obtained in the shaped inserts (6, 7; 102).

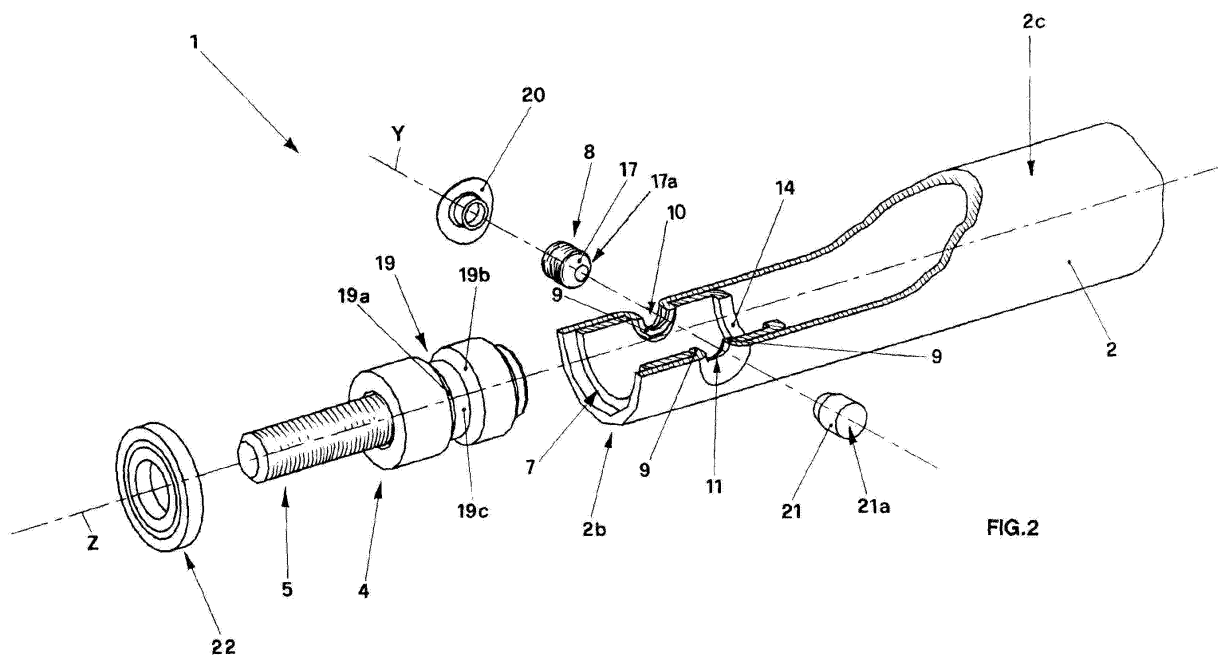


FIG.2

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Description

[0001] The invention described herein concerns a shaped gripping or supporting element and a method for the production of said shaped element.

[0002] In particular, the shaped element for which patent rights are requested consists preferably of a handle applied to the panel of a door, a drawer or any supporting structure, without excluding the possibility of application on furnishing elements such as, for example, towel rails of a bathroom of a living unit or other building.

[0003] As is known, handles consist of a shaped tubular body fixed by at least one end to a supporting structure, consisting for example of the panel of a door or a wall of a room of any building.

[0004] The present invention concerns in particular the type of handles in which the tubular body is made of metal, for example steel.

[0005] The tubular body, shaped so as to permit a comfortable safe grip by the user, has in cross section profiles of different shape, usually circular with diameters varying from 20 to 35 mm.

[0006] The thickness of the tubular body, for reasons which will be better explained below, is never less than 2 mm, generally in the range 2 ÷ 4 mm.

[0007] According to the most widespread known technique, the tubular body is combined with the supporting structure via connection means which consist essentially of an insert, inserted at the end of the tubular body, which is positioned adjacent to the supporting structure, and of a corresponding supporting element, commonly called "bush", protruding from the supporting structure to which it is fixed via fastening means of the known type, for example a screw that engages in a rawl plug pressed into the supporting structure.

[0008] To complete the application and give the coupling between tubular body and supporting structure greater stability, further screw fastening means are provided, consisting for example of a grub screw inserted in coaxial through holes obtained in the tubular body and in the insert, stopping against the outer wall of the bush.

[0009] The shaped elements described above have some recognised drawbacks, however.

[0010] The main drawback is constituted by the fact that the coupling between insert and tubular body is obtained via screw means.

[0011] In fact, the tubular body has on its inner walls of each end a nut screw with which a screw obtained on the outer surface of the insert engages.

[0012] The provision of said screw means on the insert and on the tubular body increases the complexity of the machining required to obtain the shaped element, with consequent increase in production times and costs.

[0013] A second drawback is due to the fact that, to obtain the nut screw, the thickness of the tubular body must be no less than a certain value, 2 mm as said.

[0014] Therefore, the weight of the tubular body, although increasingly lightweight in modern solutions,

does not drop below certain values dictated by production requirements.

[0015] Said aspect is of no small significance, in the light of the market tendency towards increasingly lightweight handles.

[0016] A further drawback derives from the fact that in the long term the screw means, due to their specific function, and being under the continuous grip of the shaped element, cause a certain play between the tubular body and the insert, thus loosening and affecting even only partly the stability of the coupling between these components.

[0017] The present invention intends to overcome the above-mentioned drawbacks.

[0018] In further detail, the main aim of the present invention is to provide a shaped gripping or supporting element that is simpler than equivalent shaped elements of known type.

[0019] A second aim of the invention is to reduce the times and costs associated with the production of a shaped gripping or supporting element with respect to the known art.

[0020] A further aim is to produce shaped gripping or supporting elements that are thinner than the shaped elements of the known type, thus making available, consequently, with the same diameter, shaped supporting or gripping elements that are lighter than those produced according to the known art.

[0021] Last but not least, a further aim of the invention is to obtain a coupling between the inserts and the tubular body of a shaped gripping or supporting element that is more stable and resistant in the long term compared to the shaped elements currently available on the market.

[0022] Said aims have been achieved through the implementation of a shaped gripping or supporting element which, in accordance with the contents of the first claim, comprises:

- a shaped tubular body provided with at least one end suited to be connected to a supporting structure;
- at least one supporting element suited to be applied to said supporting structure via first fastening means which protrude from the outer surface of said supporting structure;
- at least one shaped insert, inserted in said end of said tubular body, suited to be combined with said supporting element when said tubular body is positioned adjacent to said supporting structure;
- second fastening means suitable for connecting in a stable manner said tubular body and said supporting element,

characterised in that it comprises third fastening means consisting of the drawn-in edge of at least one first through hole obtained in said tubular body, said drawn-in edge extending towards the inner surface of one or more radial housings obtained in said shaped insert.

[0023] The subject of the present invention is also a

method for the production of a shaped element of the type comprising a shaped tubular body and at least one shaped insert that connects said tubular body to a supporting structure which, in accordance with the corresponding main claim, is characterised in that it comprises the following operations:

- making said tubular body;
- making said shaped insert;
- making one or more radial housings in said shaped insert;
- coupling said shaped insert with said tubular body;
- punching said tubular body at the level of said radial housings to obtain in said tubular body at least one first through hole, the drawn-in edge of which extends towards the inner surface of said housings.

[0024] Advantageously, the shaped gripping or supporting element subject of the invention is simpler to produce than the elements carried out according to the known art.

[0025] Again advantageously, the shaped element of the invention is produced more quickly than in the known art, with consequent advantages in terms of resulting costs for the producer.

[0026] Again advantageously, the invention concerns the production of particularly thin shaped gripping or supporting elements, thinner than those produced according to the known art.

[0027] This results in the advantage of lightening some shaped gripping or supporting elements, an aspect that will be more attractive for market operators.

[0028] In an advantageous manner, furthermore, the invention determines a particularly effective connection between the shaped insert and the tubular body, stable and long-lasting, less subject to wear or breakage than equivalent shaped elements of the known type.

[0029] This is achieved by eliminating from the shaped inserts and the tubular body the screw means used in the known art most similar to the invention, and by adopting a connection system based on drawing-in of the tubular body towards the inner walls of housings obtained in the shaped insert, with high load resistance.

[0030] Experimental tests performed in an engineering workshop have shown that the shaped element of the invention bears considerable loads, in the order of 1,200 N/mm².

[0031] The aims and advantages described above, and others which will be better specified in the course of the present patent, will be highlighted in greater detail in the description of preferred embodiments of the invention provided as a guide, with reference to the attached drawings, wherein:

- Figure 1 is an exploded axonometric view of the shaped element of the invention during application to a supporting structure;
- Figure 2 is a partially sectioned axonometric view of

the tubular body of Figure 1;

- Figure 3 shows a sectioned detail of Figure 2;
- Figure 4 shows an enlarged detail of Figure 3;
- Figure 5 is an axonometric view of the detail shown in Figure 4;
- Figure 6 is the front view of Figure 5;
- Figure 7 is an axonometric view of the drawing-in operation of the method of the invention;
- Figure 8 is an axonometric view of the connection operation of the method of the invention;
- Figure 9 shows a variant of Figure 3;
- Figure 10 shows a detail of Figure 9.

[0032] The shaped gripping or supporting element subject of the invention is illustrated in Figure 1, where it is indicated as a whole by **1**, during application to a supporting structure **S**.

[0033] In this case, the shaped element **1** is a handle applied to the supporting structure **S**, for example a door panel.

[0034] It is understood, however, that in further embodiments of the invention the shaped element may constitute any supporting handle combined with a piece of furniture or a wall of a room of a building, or a supporting body, such as the rail in a bathroom of a living unit, for thin objects folded around it, for example towels.

[0035] As can be seen in Figure 1, the shaped element **1** comprises:

- a shaped tubular body **2**, preferably made of metal, for example steel, provided with ends **2a**, **2b** which are connected to the supporting structure **S**;
- a pair of supporting elements **3**, **4**, also made of metal, applied to the supporting structure **S** via first fastening means, indicated as a whole by **5** and of the type known to a person skilled in the art, which protrude from the outer surface **S_e** of the supporting structure **S**;
- a pair of shaped inserts **6**, **7**, each inserted in the corresponding end **2a**, **2b** of the tubular body **2**, designed to be coupled with the corresponding element of the supporting elements **3**, **4** when the tubular body **2** is positioned adjacent to the supporting structure **S**;
- second fastening means, indicated as a whole by **8**, used to connect in a stable manner the tubular body **2** and the supporting elements **3**, **4**.

[0036] It should be noted that in other embodiments of the invention the tubular body can be provided with one single end connected to the supporting structure. Below, for the sake of convenience and in accordance with the contents of Figures from 2 to 6, the construction form of the shaped element **1** will be described with reference to the shaped insert **7** only, connected to the tubular body **2** in correspondence with the end **2b**, it being understood that the explanation also applies to the other shaped insert **6**, connected to the end **2a** of the tubular body **2**.

[0037] According to the invention, the shaped element 1 comprises third fastening means consisting of the drawn-in edge 9 of a pair of first through holes 10, 11 obtained in the tubular body 2, the drawn-in edge 9 extending towards the inner surface 12a, 13a of two radial housings 12, 13 obtained in the shaped insert 7 and visible in greater detail in Figure 4.

[0038] The shaped insert 7 consists of a tubular element 14, provided with a first end 14a through which the supporting element 4, which protrudes from the supporting structure S, is inserted in the tubular element 14.

[0039] The radial housings 12, 13 are opposed, develop in a first longitudinal direction Y and are positioned symmetrically with respect to the longitudinal axis Z of the shaped insert 7.

[0040] According to the preferred embodiment described herein, each of the radial housings 12, 13 consists of a second through hole, coaxial with the corresponding one of the first through holes 10, 11 obtained in the tubular body 2, made in the side wall 14c of the tubular element 14.

[0041] The drawn-in edge 9 belonging to the first through holes 10, 11 of the tubular body 2 thus covers the inner surface 12a, 13a of the respective radial housings 12, 13.

[0042] The construction detail just described can be clearly seen in Figure 3, which highlights the construction form of the shaped element 1 after the provision of a nut screw 18 on the drawn-in edge 9 which covers the inner surface 13a of the radial housing 13, and the inner surface of the first through hole 11.

[0043] In accordance with other embodiments of the invention, the radial housings can consist of blind holes obtained in the side wall of the shaped insert.

[0044] As regards the second fastening means 8, Figure 2 highlights that they consist of a grub screw 17 which engages with the above-mentioned nut screw 18.

[0045] In further detail, the end 17a of the grub screw 17 is housed in an annular groove 19 obtained in the supporting element 4, delimited by slanting lateral surfaces 19a, 19b which force the end 17a of the grub screw 17 against the bottom 19c of the groove 19 when the grub screw 17 is inserted in the first through hole 11 and in the radial housing 13 to interlock the shaped insert 7 and the supporting element 4.

[0046] Preferably but not necessarily, the lateral surfaces 19a, 19b of the annular groove 19 have an angle of 45°, particularly suitable for the function just described.

[0047] Again in Figure 2 it can be seen that the shaped element 1 comprises a plastic plug 20, applied outside the grub screw 17 which otherwise, in application situations, would be undesirably visible.

[0048] The plug 20 provides a continuous surface between the holed area and the outer surface 2c of the tubular body 2.

[0049] The shaped element 1 comprises, furthermore, a wedge 21 pressed into the first through hole 10 and into the housing 12 opposite the one in which the grub

screw 17 is inserted, intended to support on the outer surface 21a symbols, characters, wording, logos, trademarks or similar for identification purposes, affixed for example by screen-printing.

[0050] The shaped element 1 comprises, furthermore, a seal gasket 22, preferably made of plastic, positioned adjacent to the shaped insert 7 and protruding from the tubular body 2, which purposely separates the tubular body 2 from the supporting structure S when it is applied to it.

[0051] This construction solution is important when the shaped element 1 is combined with the supporting structure S, consisting as said of a panel, if this is made of material different from that of the tubular body 2, for example wood.

[0052] The seal gasket 22 prevents the contact between the tubular body 2 made of steel and the supporting structure S made of wood from causing excess wear of the latter in the long term.

[0053] Figures 5 and 6 illustrate, therefore, that the tubular element 14 has at a second end 14b a shoulder 15 where a notch 16 is obtained, which develops mainly according to a direction X square to the first longitudinal direction Y identified by the radial housings 12, 13, which acts as a reference in the connection phase between the shaped insert 7 and the tubular body 2.

[0054] Figures 9 and 10 show a variant of the invention in which the shaped element, generically indicated by 100, differs from the previous one due to the type of radial housings in which the drawn-in edge 106 of the tubular body 101 extends inwards.

[0055] Each housing 103, 104 consists of an annular recess 107, 108, more clearly visible in the detail of Figure 10, positioned at the level of the outer surface 105a of the tubular element 105 and obtained at the end of a second through hole 109, 110 made in the side wall 105b of the tubular element 105.

[0056] The annular recess 107, 108 has a diameter D greater than the diameter d of the corresponding second through hole 109, 110.

[0057] The difference between the diameter D of the annular recess 107, 108 and the diameter d of the second through hole 109, 110 is equal to the thickness of the drawn-in edge 106 of the tubular body 101.

[0058] In this case, the nut screw 113, on which the grub screw 115 of the second fastening means, generically indicated by 114, will engage, is obtained on the drawn-in edge 106 which covers the inner surface of the annular recess 107 and on the inner surface of the second through hole 109.

[0059] The solution featuring a shaped insert 6, 7 relative to the shaped element 1 is particularly suitable for tubular bodies with very small diameter, even 15 mm, while the solution relative to the shaped element 100 is suitable for tubular bodies with diameter of no less than 20 mm, for example 25, 30 or 35 mm, which are the diameters typically produced.

[0060] The invention to be protected also refers to a

method for the production of a shaped element of the type indicated above by **1** or **100** and comprising a tubular body **2** or **101** and a pair of shaped inserts, indicated for example by **6, 7** for the shaped element **1**, which connect the tubular body **2** or **101** to a supporting structure **S**.

[0061] According to the invention, the method comprises the following operations:

- making the tubular body **2** or **101**;
- making the shaped inserts **6, 7** or **102**;
- making in the shaped inserts **6, 7** or **102** two radial housings **12, 13** or **103, 104**;
- coupling the shaped inserts **6, 7** or **102** to the respective tubular body **2** or **101**, as illustrated in Figure 7;
- punching the tubular body **2** or **101** at the level of the radial housings **12, 13** or **103, 104** to obtain in the tubular body **2** or **101** a pair of first through holes **10, 11** or **111, 112**, the drawn-in edge **9** or **106** of which extends towards the inner surface **12a, 13a** of the corresponding housings **12, 13** or **103, 104**, as shown in Figure 8.

The method comprises, furthermore, a threading operation of the drawn-in edge **9** and, in the case of the shaped element **100**, of the drawn-in edge **106** and of the second through hole **109** obtained in the shaped insert **102**, performed after the punching of the tubular body **2** or **101**, suited to permit application of second fastening means, of the type indicated by **8** in the variant of Figure 1, in order to lock in a stable manner the tubular body **2** or **101** to the supporting structure **S**.

[0062] The shaped inserts **6, 7** or **102** are connected to the respective tubular body **2** or **101** by pressure insertion.

[0063] The insertion operation is performed by positioning the shaped inserts **6, 7** or **102** so as to arrange the housings **12, 13** or **103, 104** according to a first substantially vertical longitudinal direction **Y**.

[0064] This is aimed to permit punching to be performed with a tool that operates in a vertical direction according to the manufacturer's needs.

[0065] The shaped element subject of the invention, in the construction forms described, has a very high load resistance, superior to that of equivalent known shaped elements.

[0066] This is obtained by providing on the tubular body a drawn-in edge which extends into radial housings obtained in the shaped inserts.

[0067] The machining work for drawing-in the edge can furthermore be performed more rapidly, by means of commonly used tools, than in the known technique.

[0068] The coupling between shaped inserts and tubular body does not use screw means, typical of the known art, which unnecessarily complicate construction of the shaped element.

[0069] Moreover, the tubular body of the shaped grip-

ping or supporting element available to the user can be produced in any thickness, since no threading is performed on the inner surface at its ends.

[0070] Since the shaped elements of the known type make use of screw means, they require the tubular body thickness to be no less than 2 mm, otherwise it is impossible to perform the threading operation.

[0071] Via the invention, the thickness of the tubular body can drop below said value, extending the range of tubular bodies that can be used for these types of applications and reducing the amount of material required, with evident savings on costs.

[0072] Consequently, the shaped element is lightened with respect to those carried out according to the known technique, a particularly important aspect in relation to the market preference for increasingly lightweight shaped elements.

[0073] The invention furthermore enables the manufacturer to reduce production times and costs associated with the production of a shaped gripping or supporting element of the type previously described, since it simplifies the machining required.

[0074] On the basis of the above, it can be seen that the shaped gripping or supporting element of the invention and the related embodiment method achieve the objectives and offer the advantages mentioned previously.

[0075] Upon implementation, modifications may be made to the shaped element of the invention consisting, for example, in different forms and dimensions of the tubular body.

[0076] The tubular body may, in other applications, be combined with the supporting structure in a different way with respect to what is illustrated in the figures below, for example in a horizontal position.

[0077] Punching of the tubular body will then be performed by arranging the tubular body in a vertical position, so that upon implementation the plug that covers the fastening grub screw and the wedge that closes the related through holes made in the tubular body and in the shaped insert are not directly visible.

[0078] In addition to this, the material constituting the tubular body, the shaped insert and the supporting elements that can be combined with the supporting structure can be of the type known to a person skilled in the art.

[0079] Furthermore, the second fastening means can be different from the grub screws described previously, without affecting the advantage offered by the present patent.

[0080] All the changes described and referred to, but not shown in the attached drawings, must be considered protected by the present patent, provided that they come under the scope of the following claims.

Claims

1. Shaped gripping or supporting element (1; 100) comprising:

- a shaped tubular body (2; 101) provided with at least one end (2a, 2b) suited to be connected to a supporting structure (S);
 - at least one supporting element (3, 4), suited to be applied to said supporting structure (S) by means of first fastening means (5) which protrude from the outer surface (S_e) of said supporting structure (S);
 - at least one shaped insert (6, 7; 102), inserted in said end (2a, 2b) of said tubular body (2; 101), suited to be connected to said supporting element (3, 4) when said tubular body (2; 101) is positioned adjacent to said supporting structure (S);
 - second fastening means (8; 114) suited to connect in a stable manner said tubular body (2; 101) and said supporting element (3, 4),
- characterised in that** it comprises third fastening means consisting of the drawn-in edge (9; 106) of at least one first through hole (10, 11; 111, 112) obtained in said tubular body (2; 101), said drawn-in edge (9; 106) extending towards the inner surface (12a, 13a) of one or more radial housings (12, 13; 103, 104) obtained in said shaped insert (6, 7; 102).
2. Element (1; 100) according to claim 1), **characterised in that** said shaped insert (6, 7; 102) comprises two opposed radial housings (12, 13; 103, 104), which develop according to a first longitudinal direction (Y), arranged symmetrically with respect to the longitudinal axis (Z) of said shaped insert (6, 7; 102).
 3. Element (1; 100) according to claim 2), **characterised in that** said shaped insert (6, 7; 102) consists of a tubular element (14; 105) provided with a first end (14a) through which said supporting element (3, 4) is inserted in said tubular element (14; 105).
 4. Element (1) according to claim 3), **characterised in that** each of said radial housings (12, 13) consists of a second through hole, coaxial with said first through hole (10, 11), made in the side wall (14c) of said tubular element (14).
 5. Element (1) according to claim 4), **characterised in that** said drawn-in edge (9) covers said inner surface (12a, 13a) of said radial housing (12, 13).
 6. Element (100) according to claim 3), **characterised in that** each of said radial housings (103, 104) consists of an annular recess (107, 108), obtained at the level of the outer surface (105a) of said tubular element (105) and arranged at the end of a second through hole (109, 110), coaxial with said first through hole, made in the side wall (105b) of said tubular element (105).
 7. Element (100) according to claim 6), **characterised in that** said annular recess (107, 108) has a diameter (D) greater than the diameter (d) of said second through hole (109, 110).
 8. Element (100) according to claim 7), **characterised in that** the difference between said diameter (D) of said annular recess (107, 108) and said diameter (d) of said second through hole (109, 110) is equal to the thickness of said drawn-in edge (106) of said tubular body (101).
 9. Element (1; 100) according to claim 3), **characterised in that** said tubular element (14; 105) has at a second end (14b) a shoulder (15) in which a notch (16) is obtained, which develops mainly according to a direction (X) square to said first longitudinal direction (Y) identified by said radial housings (12, 13; 103, 104), suited to constitute a reference for the insertion of said shaped insert (6, 7; 102) in said tubular body (2; 101).
 10. Element (1) according to claim 1), **characterised in that** said second fastening means (8) consist of a grub screw (17) which engages with a nut screw (18) obtained on said drawn-in edge which covers said inner surface (12a, 12b) of at least one of said housings (12, 13).
 11. Element (100) according to claim 1), **characterised in that** said second fastening means (114) consist of a grub screw (115) which engages with a nut screw (113) obtained on said drawn-in edge (106) which covers said inner surface of said annular recess (107) of at least one of said housings (103, 104).
 12. Element (1; 100) according to claim 10) or 11), **characterised in that** the end (17a) of said grub screw (17; 115) is housed in an annular groove (19) obtained in said supporting element (3, 4), delimited by slanting lateral surfaces (19a, 19b) that force said end (17a) of said grub screw (17; 115) against the bottom (19c) of said groove (19) when said grub screw (17; 115) is inserted in said first through hole (11; 112) and in at least one of said housings (12, 13; 103, 104) to interlock said shaped insert (6, 7; 102) and said supporting element (3, 4).
 13. Element (1; 100) according to claim 12), **characterised in that** said lateral surfaces (19a, 19b) of said annular groove (19) have an angle of 45°.
 14. Element (1; 100) according to claim 10) or 11), **characterised in that** it comprises a plug (20) applied externally to said grub screw (17; 115).
 15. Element (1; 100) according to claim 10) or 11), **characterised in that** it comprises a wedge (21), inserted

in said first through hole (10; 111) and in one of said housings (12, 13; 103; 104) opposite the one in which said grub screw (17; 115) is inserted, suited to support on the outer surface (21a) symbols, characters, wording, logos, trademarks or similar for identification purposes.

16. Element (1; 100) according to claim 1), **characterised in that** it comprises a seal gasket (22), arranged adjacent to said shaped insert (6, 7; 102) and protruding from said tubular body (2; 101), suited to separate said tubular body (2; 101) from said supporting structure (S) when they are adjacent to each other. 10
17. Method for the production of a shaped gripping or supporting element (1; 100) of the type comprising a shaped tubular body (2; 101) and at least one shaped insert (6, 7; 102) which connects said tubular body (2; 101) to a supporting structure (S), **characterised in that** it comprises the following operations: 20
 - making said tubular body (2; 101);
 - making said shaped insert (6, 7; 102);
 - making in said shaped insert (6, 7; 102) one or more radial housings (12, 13; 103, 104); 25
 - coupling said shaped insert (6, 7; 102) with said tubular body (2; 101);
 - punching said tubular body (2; 101) at the level of said radial housings (12, 13; 103, 104) to obtain in said tubular body (2) at least one first through hole (10, 11; 111, 112) the drawn-in edge of which (9; 106) extends towards the inner surface (12a, 13a) of said housings (12, 13; 103, 104). 30
18. Method according to claim 17), **characterised in that** it comprises a threading operation of said drawn-in edge (9), performed after said punching operation of said tubular body (2), to permit the application of second fastening means (8) suited to lock in a stable manner said tubular body (2) to said supporting structure (S). 35 40
19. Method according to claim 17), **characterised in that** it comprises a threading operation of said drawn-in edge (106) and at least one second through hole (109) obtained in said shaped insert (102), performed after said punching operation of said tubular body (101), to permit the application of second fastening means (114) suited to lock in a stable manner said tubular body (101) to said supporting structure. 45 50
20. Method according to claim 17), **characterised in that** said operation for connecting said shaped insert (6, 7; 102) to said tubular body (2; 101) is a pressure insertion. 55
21. Method according to claim 17), **characterised in**

that said operation for connecting said shaped insert (6, 7; 102) to said tubular body (2; 101) is performed by positioning said shaped insert (6, 7; 102) arranging said housings (12, 13; 103, 104) according to a first substantially vertical longitudinal direction (Y).

22. Method according to claim 17), **characterised in that** said drawn-in edge (9) covers said inner surface (12a, 13a) of said housings (12, 13) when the diameter of said tubular body (2) does not exceed 20 mm.
23. Method according to claim 17), **characterised in that** said drawn-in edge (106) is housed in an annular recess (107, 108) positioned at the level of the outer surface of said shaped insert (102) when the diameter of said tubular body (101) exceeds 20 mm.

