



(51) International Patent Classification:
F16B 19/10 (2006.01) *B60N 3/02* (2006.01)

(21) International Application Number:
PCT/US2010/058396

(22) International Filing Date:
30 November 2010 (30.11.2010)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
TO2009A000944 1 December 2009 (01.12.2009) IT

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

(54) Title: A SELF-LOCKING AUTOMOTIVE ACCESSORY FOR A VEHICLE BODY PART

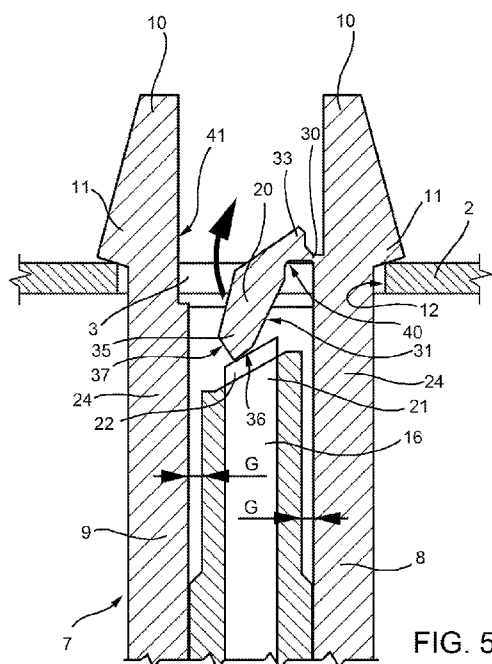


FIG. 5

(57) Abstract: A self-locking accessory (1), such as a finishing cap or handle, couplable to a perforation (3) of a vehicle body part and including at least one body (5) having a head and a shank (7) which overhangingly extends from the head and includes at least one pair of opposite, elastically deformable arms (8,9), each having one end (10) opposite to the head and provided with coupling means (11), snappingly insertable, in use, into the perforation (3) so as to engage the coupling means (11) beyond an edge (12) of the perforation; and at least one insert (15), a stem (16) of which is couplable, in use, in a through seat (18) of the shank, through an opening of the head; wherein one of the arms (8) carries a locking member (20) hinged close to its end (10) and within a seat (18) of the shank, arranged substantially parallel to the arm, when the stem (16) of the insert is not inserted into the seat (18), and arranged transversally to the arms (8,9), in a position so as to prevent them from bending, when the stem (16) is inserted into the seat (18).

A SELF-LOCKING AUTOMOTIVE ACCESSORY FOR A VEHICLE BODY
PART

TECHNICAL FIELD

5 The present invention relates to a self-locking automotive accessory, such as a finishing cap or a handle, for a vehicle body part provided with a through perforation.

BACKGROUND ART

10 It is known that for fixing passenger handles, the plate of the roof of cars is provided with through perforations, in which the coupling part of the base of the handle, resting against the inside upholstery, is fixed. On the side where the handle is not contemplated
15 (e.g. on the driver's side or for some versions of the same model) the through perforations are closed by a finishing cap.

 The fixing of the base of the handles, in a perforation or in a pair of perforations arranged side-
20 by-side is obtained in various manners, with inserts provided with screws or snap-fitted. Similarly, in order to fix the finishing cap, this is usually made as a body provided with a head (which abuts against the roof upholstery in use) and a shank provided with a pair of
25 flexible arms provided with teeth coupling onto the edge of the perforation, shank which is snap-fitted into the perforation. In order to prevent the accidental extraction caused by the bending of the arms towards one

another (which would allow the coupling teeth to release themselves) an insert is introduced within a through seat of the shank, the stem of the insert positioning with slight interference between the ends of the arms, preventing the bending thereof, and thus maintaining the body coupled.

The above-described solution is not entirely satisfactory because it requires a relatively high introduction force for the insert which consequently may be positioned not correctly.

Furthermore, if one so desires, it would not be possible to use the same fixing system for a handle instead of the finishing cap, because the insert could be extracted in use, with consequent uncoupling of the handle.

DISCLOSURE OF INVENTION

It is an object of the present invention to overcome such drawbacks of the prior art by providing a self-locking accessory, such as a finishing cap or a handle, for a vehicle body part provided with a through perforation, which is of simple construction, reliable, small and relatively cost-effective, in particular free from the risk of uncoupling of the accessory in case of extraction of the insert.

The present invention thus relates to a self-locking automotive accessory, such as a finishing cap or a handle, for a vehicle body part provided with a through perforation, as defined in claim 1.

In particular, the accessory comprises at least one body having a head and a shank which overhangingly extends from the head and comprises, in turn, at least one pair of opposite, elastically deformable arms, each
5 arm having one end opposite to the head and provided with coupling means, snappingly insertable, in use, into the perforation so as to engage the coupling means beyond an edge of the perforation; and at least one insert, a stem of which is couplable, in use, in a
10 through seat of the shank, through an opening of the head.

According to the invention, one of the arms carries a locking member hinged close to the end of the arm and within a seat of the shank, adapted to selectively take
15 a first position, in which it is arranged substantially parallel to the arm, when the stem of the insert is not inserted into the seat, and a second position, in which it is arranged transversally to the arms, so as to prevent them from bending towards each other, when the
20 stem is inserted into the seat. In particular, the stem is coupled with transversal clearance in the seat at least at one stretch of the arms arranged adjacent to the ends thereof provided with the coupling means and is shorter than the arms, so that the free end thereof is
25 close to the coupling means but not between them when the insert is inserted in the seat.

In this manner, even if the insert is accidentally extracted from the body, the latter, and thus the

accessory as a whole, in particular if it is a handle, remains locked in the perforation. Furthermore, accidental extraction of the insert becomes extremely difficult if the locking member is dimensioned so that
5 in the second position it interferes with the arms, bending them so as to move them away from one another.

BRIEF DESCRIPTION OF THE DRAWINGS

Further features and advantages of the present invention will be apparent from the following
10 description of a preferred embodiment thereof, exclusively provided by way of non-limitative example, with reference to the accompanying drawings, in which:

- figure 1 shows an axonometric three-quarters top view of a self-locking accessory which can be
15 coupled to a wall of a vehicle body, constituted in the non-limitative case in point by a finishing cap, made according to the invention;

- figure 2 shows an enlarged section view taken along a plotting plane II-II of a part of the accessory
20 in figure 1; and

- figures 3, 4, 5 and 6 show in the same section view as figure 2 and on enlarged scale the various steps of coupling of the accessory in figure 1 and of the body part.

25 BEST MODE FOR CARRYING OUT THE INVENTION

With reference to figures from 1 to 6, numeral 1 indicates as a whole a self-locking accessory, in the non-limiting case in point a finishing cap for a vehicle

body part consisting of a plate 2 of a vehicle roof, provided with a through perforation 3 for fixing the accessory 1.

It is apparent that the following description referred to a finishing cap 1 also applies to any other accessory which can be fixed to the plate 2, e.g. a handle or a clothes hook.

The accessory 1 comprises a least one body 5 having a head 6 and a shank 7 which overhangingly extends from the head 6 and comprises, in turn, at least one pair of opposite, elastically deformable arms 8,9, each having one end 10 opposite to the head 6 and provided with coupling means 11.

The shank 7 is snappingly insertable, in use, into the perforation 3 so as to engage the coupling means 11 beyond an edge 12 of the perforation 3 (figure 4), while the head 6 abuts against a padding 13 of the upholstery which covers the plate 2.

Furthermore, the accessory 1 comprises at least one insert 15, a stem 16 of which is couplable, in use, in a through seat 18 of the shank 7, through an opening 19 of the head 6.

According to the main aspect of the invention, one of the two arms 8,9, in the illustrated case in point the arm 8, carries a locking member 20, which is hinged close to end 10 and within the seat 18, in particular substantially flushed with the coupling means 11 of the shank 7, and is adapted to selectively take a first

position (figures 2 and 5), in which it is arranged substantially parallel to the arm 8, when the stem 16 of the insert 15 is not fully inserted in the seat 18, and a second position (figures 6), in which it is arranged transversally to the arms 8,9, so as to prevent them from bending towards each other, in particular since when the stem 16 is fully inserted into the seat (18) for the first time.

In particular, the stem 16 of the insert 15 is inserted into the shank 7 parallelly to the same and perpendicularly to the head 6, and has a length in the insertion direction, indicated by the arrow in figure 2, shorter than that of the arms 8,9, and such that a free end 21 of the stem 16 is close to the coupling means 11 of the arms 8,9 when the insert is fully inserted into the seat (18), but not between the same (figure 6).

The free end 21 of the stem 16 of the insert 15 has respective ridges 22 adapted to intercept the locking member 20 during the insertion stroke of the stem 16 into the seat 18 (figure 5) in order to rotate the locking member 20 in the direction of the arrow, from the first position (figure 5) to the second position (figure 6).

In particular, the free end 21 is shaped so that the respective ridges 22 of the stem 16 are obliquely arranged to the insertion direction and so as to converge towards the end 10 of the arm 8, i.e. the one provided with the locking member 20, on the side of the

hinging point of this latter.

Finally, according to a feature of the invention, the stem 16 is coupled with transversal clearance G in the seat 18 (figures 5,6) at least at one stretch 24 of the arms 8,9 arranged immediately adjacent to the ends 10 of the same provided with coupling means 11.

The coupling means 11 consist of respective oblique teeth which protrude outwards from the shank 7 and which are obtained at the entire length of the ends 10 of the arms 8,9; the length of arms 8,9 is such that, in use, the ends 10 project entirely beyond the edge 12 of the perforation 3.

In the illustrated example, the locking member 20 is integrally connected in one piece to the arm 8 by means of a plastic hinge consisting of a thinned tongue 30 which extends from a face 31 (figure 5 and 6), facing the head 6, of the locking member 20, from a point thereof placed close to a first end 33 thereof, which overhangingly protrudes from the tongue towards the arm 8 with which the tongue 30 is integrally obtained.

A second end 35 of the locking member 20, opposite to the end 33, is facing the other arm 9 and is wedge-shaped, being delimited by a pair of oblique surfaces 36,37 converging toward each other, surface 36 being intended to cooperate with the stem 16 and surface 37 being intended to cooperate with the arm 9 to act in use, when the insert 15 is fully inserted in the body 5, as an abutting member for the arm 9.

Furthermore, the locking member 20 is provided with a dihedral-angle-shaped recess 40 (figures 5,6) in a position adjacent to the tongue 30 constituting the plastic hinge and on the side opposite to the end 33; 5 the arm 9 opposite to the one provided in one piece with the locking member 20, is provided with a step-shaped recess 41 obtained inside the seat 18 and substantially facing the locking member 20.

In the illustrated example, the head 6 of the body 10 5 is flange-shaped and the insert 15 is shaped as a cap insertable into the opening 19 of the flange 6, within a recess 50 (figure 1); the insert 15 is further obtained in one piece with the head 6, to which it is connected by means of a plastic hinge consisting of a thinned 15 tongue 51. Furthermore, the shank 7 further comprises a pair of substantially rigid fins 53 arranged by the side of the arms 8,9, and oriented parallelly to the bending plane of the arms 8,9, which serve as guides for inserting the body 5 in the perforation 3.

20 In use, the accessory 1, which is obtained in the configuration in figure 1 by molding of a synthetic plastic material, is mounted with solely the body 5 on the plate 2, introducing the ends 11 of the arms 8,9 within the perforation 3. Being the arms 8,9 obtained at 25 a reciprocal distance (defining the width of the seat 18) greater than the width of the perforation 3, during the introduction movement, the edges 12 thereof cooperate with the front part of the coupling teeth 11,

which are shaped in such parts converging to one another. Thus, the arms 8,9 are subjected to bending and their stretches 24 assume the bent position in figure 3 allowing the teeth 11 to pass beyond the edge 12.

5 Subsequently, the arms 8,9 reassume by elastic reaction the initial position (figure 4) engaging with a rear part of the coupling teeth 11 the edge 12, beyond the same. In this configuration, the body 5 is integrally engaged on the plate 2 but may be
10 accidentally released.

 In order to prevent this occurrence, at this point the shank 16 of the insert 15 is inserted; the locking member 20 until this point is in the first position, arranged parallel to the arm 8 and at the stretches 24
15 of the arms 8,9 immediately adjacent to the ends 10, with the end 33 arranged substantially flushed with the tooth 11; in this position it does not interfere with the bending possibility of the arms 8,9 towards one another.

20 By introducing the stem 16 in the seat 18, this intercepts the surface of the locking member 20 with the ridges 22, which is arranged eccentric to the tongue 30 constituting the rotation centre of the member 20 itself. Consequently, the latter is forced to
25 progressively turn, gradually as the introduction of the stem 16 is completed, towards the second position.

 In this position, it abuts with the end 33 against the arm 8 and positions the end 35 adjacent to the arm

9, while the face 31 abuts against the end 21, preventing any possible extraction of the accessory 1 from the perforation 3.

By appropriately dimensioning the locking member
5 20, so that the dimension thereof comprised between the ends 33 and 35 is substantially either equal to or slightly greater than the reciprocal distance between the arms 8,9, it can be obtained the coupling of the end 35 in the recess 41 and/or the outwards bending of the
10 shank 7 of the arms 8,9, with consequent even safer locking of the body 5. Furthermore, a similar bending of the arms 8,9 may produce the clamping of the stem 16 on the side of the head 6, also blocking the insert 15.

CLAIMS

1. A self-locking accessory (1), such as a finishing cap or handle, for a vehicle body part (2) provided with a through perforation (3), comprising at least one body (5) having a head (6) and a shank (7) which overhangingly extends from the head and comprises, in turn, at least one pair of opposite, elastically deformable arms (8,9), each having one end (10) opposite to the head and provided with coupling means (11),
10 snappingly insertable, in use, into the perforation (3) so as to engage the coupling means (11) beyond an edge (12) of the perforation; and at least one insert (15), a stem (16) of which is couplable, in use, in a through seat (18) of the shank, through an opening (19) of the
15 head; characterized in that one of the arms (8) carries within a seat (18) of the shank a locking member (20) which is hinged close to the end (10) of the arm and which is adapted to selectively take a first position, in which it is arranged substantially parallel to the
20 arm (8), when the stem (16) of the insert is not inserted into the seat (18), and a second position, in which it is arranged transversally to the arms (8,9), so as to prevent them from bending towards each other, when the stem (16) is inserted into the seat (18).

25 2. An accessory according to claim 1, characterized in that the stem (16) of the insert is inserted into the shank (7) parallelly to the same and perpendicularly to the head (6), and has a length in the

insertion direction shorter than that of the arms (8,9), and such that the free end (21) of the stem is close to the coupling means (11) of the arms (8,9) when the insert is inserted into the seat (18).

5 3. An accessory according to claim 2, characterized in that said free end (21) of the insert stem has respective ridges (22) adapted to intercept the locking member (20) during the insertion stroke of the stem (16) into the seat (18) in order to rotate the
10 locking member (20) from the first position to the second position.

 4. An accessory according to claim 3, characterized in that said free end (21) is shaped so that the respective ridges (22) of the stem are
15 obliquely arranged to the insertion direction and so as to converge towards the arm (8) provided with the locking member, on the side of the hinging point of the latter.

 5. An accessory according to one of the preceding
20 claims, characterized in that said stem (16) is coupled with transversal clearance in the seat (18) at least at one stretch (24) of the arms arranged adjacent to the ends (10) of the same provided with coupling means (11).

 6. An accessory according to one of the preceding
25 claims, characterized in that said coupling means consist of respective oblique teeth (11) which protrude outwards from the shank (7) and which are obtained at the ends (10) of the arms.

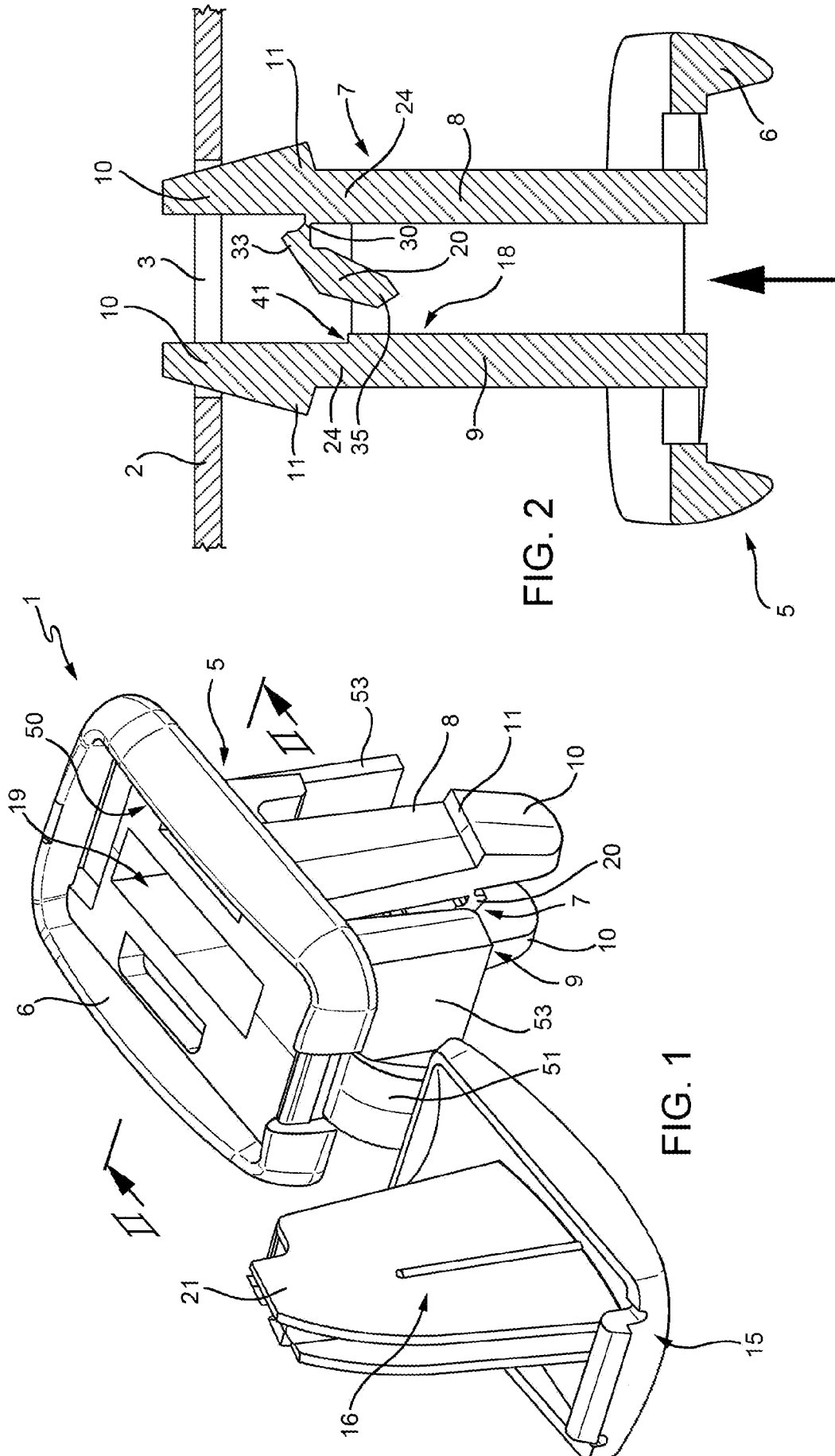
7. An accessory according to one of the preceding claims, characterized in that said locking member (20) is integrally connected to said arm (8) by means of a plastic hinge consisting of a thinned tongue (30) which
5 extends from a face (31) of the locking member facing the head, from a point thereof placed close to a first end (33) thereof, which overhangingly protrudes from the tongue towards the arm (8) with which the tongue is integrally obtained; a second end (35) of the locking
10 member, opposite to the first, facing the other arm (9) and being wedge-shaped, being delimited by a pair of oblique surfaces (36,37) converging to each other, a first surface (36) intended to cooperate with the stem (16) and a second surface (37) intended to cooperate
15 with the other arm (9) to acts as an abutting member for the same.

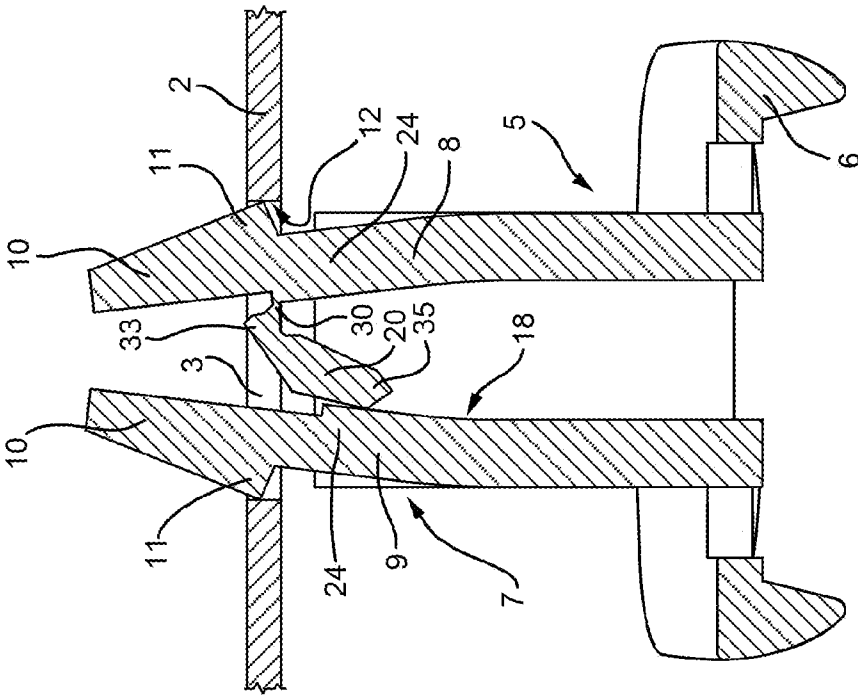
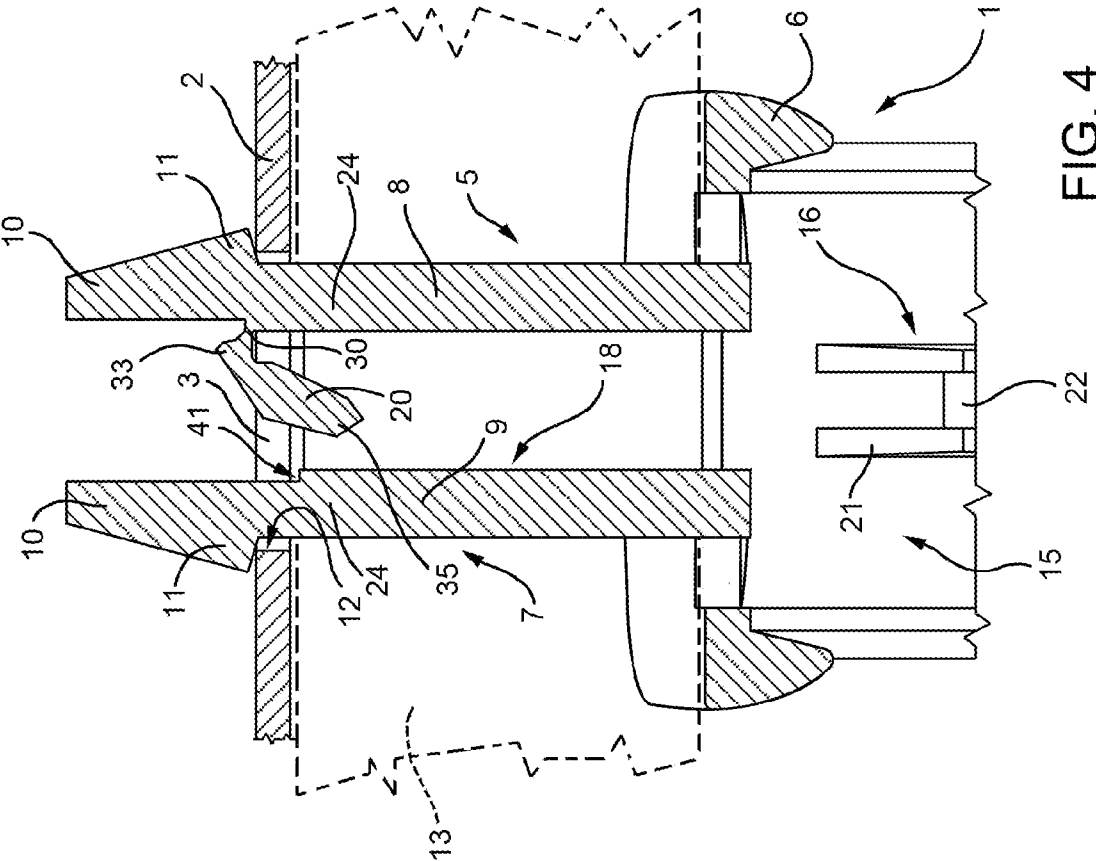
8. An accessory according to claim 7, characterized in that said locking member (20) is provided with a dihedral-angle-shaped recess (40) in a
20 position adjacent to the tongue (30) forming the plastic hinge and on the side opposite to the first end (33); the arm (9) opposite to the one integrally provided with the locking member (20) being provided with a step-shaped recess (41) obtained inside the seat and
25 substantially facing the locking member (20).

9. An accessory according to one of the preceding claims, characterized in that said head (6) of the body is flange-shaped and said insert (15) is shaped as a cap

insertable into the opening (19) of the flange; the insert (15) being obtained in one piece with the head (5), to which it is connected by means of a plastic hinge consisting of a thinned tongue (51).

- 5 10. An accessory according to one of the preceding claims, characterized in that said shank (16) further comprises a pair of substantially rigid fins (53) arranged by the side of the arms, oriented parallelly to the bending plane of the arms (8,9).





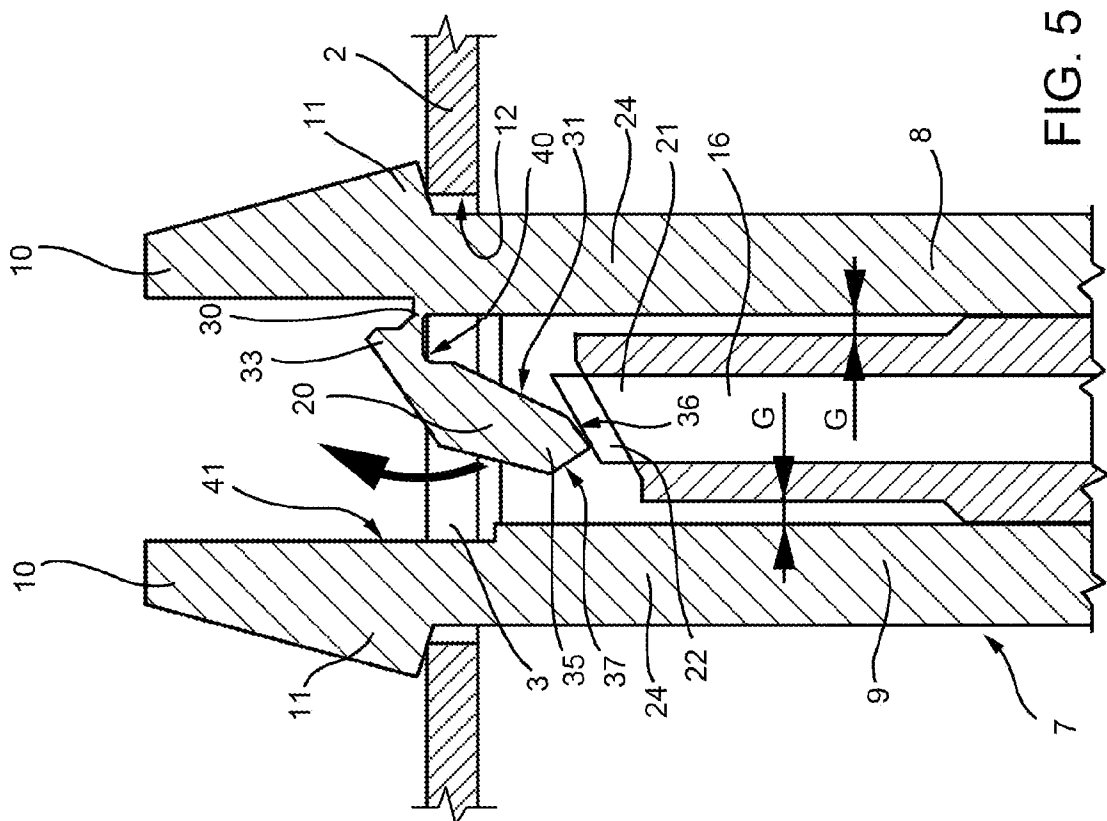


FIG. 5

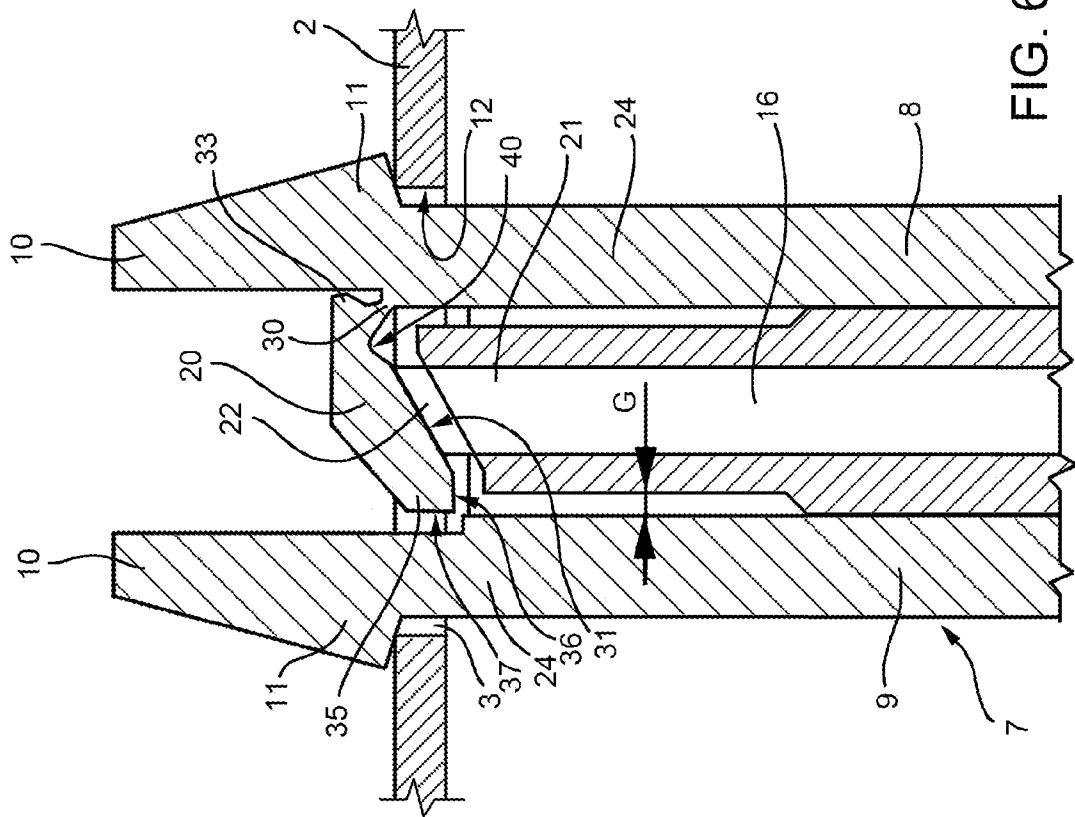


FIG. 6

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2010/058396

A. CLASSIFICATION OF SUBJECT MATTER
INV. F16B19/10 B60N3/02
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
F16B B60N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2004/181917 A1 (SAWATANI SEIJI [JP]) 23 September 2004 (2004-09-23)	1,2,7,8
A	paragraph [0035] - paragraph [0039] paragraph [0050] - paragraph [0052]; figures 2,6	3-6,9,10
X	FR 2 904 386 A1 (I T W DE FRANCE SOC PAR ACTION [FR]) 1 February 2008 (2008-02-01)	1,5,6
A	claim 1; figures 1,2,5,6,18,19,20,23	2-4
A	EP 1 046 825 A2 (PIOLAX INC [JP]) 25 October 2000 (2000-10-25) abstract; figures	1,5,6,9, 10



Further documents are listed in the continuation of Box C.



See patent family annex.

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Date of the actual completion of the international search

16 March 2011

Date of mailing of the international search report

23/03/2011

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2010/058396

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