



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
15.03.2023 Bulletin 2023/11

(51) International Patent Classification (IPC):
B65D 63/16 (2006.01)

(21) Application number: **22195180.9**

(52) Cooperative Patent Classification (CPC):
B65D 63/16

(22) Date of filing: **12.09.2022**

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

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(30) Priority: **13.09.2021 EP 21306256**

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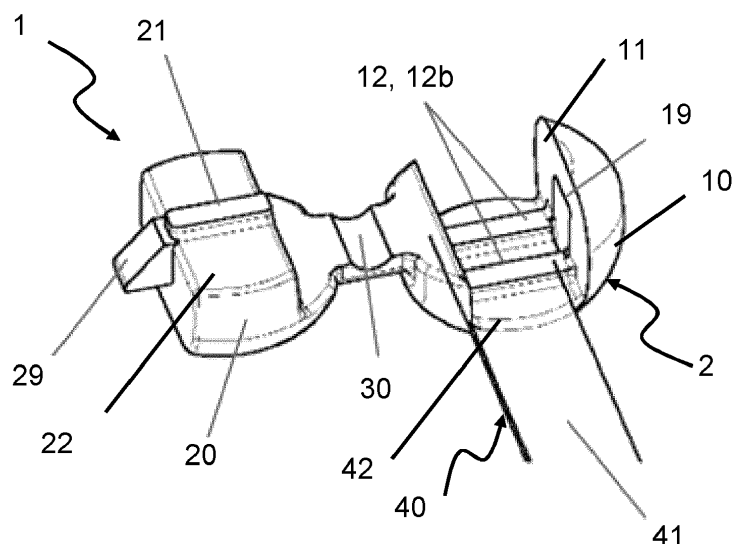
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(54) **HYBRID CABLE TIE**

(57) A hybrid cable-tie (1) for tightening one or more cables, having:
- a head (2) having a cover (20) and a base (10), the cover (20) being hinged to the base (10) to be movable between an open position and a closed position,
- a lacing band (40) having a strap (41) and an attachment portion (42) connecting the strap (41) to the head (2),
wherein :

- the head (2) is arranged to receive, between the base (10) and the cover (20), a portion of the strap (41), and
- one of the base (10) and the cover (20) has a first protrusion (21) and the other of the base (10) and the cover (20) has a counter-shape arranged in regard to the first protrusion (21) when the cover (20) is in the closed position so as to pinch the strap (41).

Fig. 1



Description

TECHNICAL FIELD

[0001] The present disclosure relates to the field of holding cables and the like, for all industries and in particular in the aeronautic industry. Such a system can be used for example to safely bundle cables or cables harnesses.

BACKGROUND

[0002] The lacing of one or more cables or harnesses with materials such as nylons or polyester is known in the art. Actually, to apply the lacing material onto a cable (or a set of cables or a harness and the like), an operator needs approximatively 20 to 25 seconds: the operator needs to make a knot and to finally cut the lacing. Further, the operator needs to follow a specific process to make the knot so that the knot does not unravel, and he may damage the cable when cutting the lacing. The operator could fail, rework the knot or the knot may not be secured properly. In addition, the operator currently needs specific and technical training to learn how to make the knot, which is complex and time-consuming.

[0003] Another known technique is to apply an adhesive tape made of PTFE but it can become loose and have a bad quality in particular at the end portion. Another known technique is a cable tie fully made in plastic (100%).

[0004] The document US2015321814 discloses a bundle tie device having a strap with transversal knurl teeth, associated with an enclosure buckle with an upper top elevated from the strap leading end by a solid state side wall, forming a longitudinal channel and aperture for transversal docking and undocking of the strap middle part by cross slipping over the tooth unit.

[0005] However, the fixation relies on the transversal knurl teeth which does not allow for a correct tensioning and limits the material to be used for the strap. Further, during mounting (in particular tensioning), the transversal knurl may be damaged and the correct tensioning lost. Still further, due to the pitches between the transversal knurl, there is no possibility to correctly adjust the desired length of the clamped portion or to adjust the correct wrapped section of the strap onto the one or more cables.

[0006] Therefore there is a need for another kind of cable-tie with improved tensioning which is more precise and also quicker and easier to mount onto one or more cables. Further, there is a need for other types of material for the strap, in particular so as to not damage the cables during the mounting operations. In addition, it is desirable to have lighter materials because conventional cable ties may have heavy or bulky parts.

SUMMARY

[0007] In view of the above, the aim of the present dis-

closure is to reduce the time it takes to bundle a cable harness (or one or more cables or wires), to make it easier in order to avoid a cutting step, to be repeatable and reliable and to avoid any damage to the cable harness.

5 That is to say, the cable tie of the present disclosure avoids a first cutting step before mounting but not necessarily a cutting step after mounting (the lacing may or may not be cut).

[0008] The present disclosure concerns a hybrid cable-tie for tightening one or more cables, having:

- a head having a cover and a base, the cover being movable between an open position and a closed position,
- 15 - a lacing band having a strap and an attachment portion connecting the strap to the head,

wherein :

- 20 - the head is arranged to receive, between the base and the cover, a portion of the strap, and
- one of the base and the cover has a first protrusion and the other of the base and the cover has a counter-shape arranged in regard to the first protrusion
- 25 when the cover is in the closed position so as to pinch the strap.

[0009] This allows to reduce the time for tightening the one or more cables, to make it easier in order to avoid a cutting step, to be repeatable and reliable and to avoid any damage to the cables. Further, this allows to guarantee a very effective holding of cables within a minimal space and a very light weight. Still further, this allows to provide high tensile strength without any damage of the cable. This also allows for a wider selection of the raw material used for the strap.

[0010] The hybrid cable-tie may be simply named cable-tie here after.

[0011] Advantageously, the attachment portion connecting the strap to the head is attached to the base. Alternatively, the attachment portion connecting the strap to the head is attached to the cover.

[0012] Advantageously, the counter-shape has a facing portion in regard to the first protrusion when the cover is in the closed position, and a second protrusion beside the facing portion so as to form a chicane, the facing portion being preferably flat.

[0013] This allows to form an obstacle on the race-course (or the path) of the strap when placed in the receiving portion of the base, so as to allow a firm clamping of the strap between the base and the cover, when the cover is in the closed position.

[0014] Advantageously, the counter-shape has a recess in regard to the first protrusion when the cover is in the closed position.

[0015] This allows to provide a simple structure and a firm clamping of the strap.

[0016] Advantageously, the counter-shape has a sec-

ond protrusion and a third protrusion so as to form the recess therebetween.

[0017] This allows to propose a simple and efficient structure, which is easy to manufacture and easy to handle in view of tightening the one or more cables, in particular the tensioning of the strap.

[0018] Advantageously, the lacing band extends longitudinally, the head defines a longitudinal portion arranged to receive the portion of the strap, and the first protrusion and the second protrusion extend in a width direction of the longitudinal portion.

[0019] Advantageously, the longitudinal portion is a longitudinal recess.

[0020] Advantageously, the hybrid cable-tie has at least one fixation system arranged to lock the cover onto the base in the closed position.

[0021] Advantageously, the fixation system has a snap-fit fixation and a locking device and:

- one of the base and the cover has the snap-fit fixation, and
- the other of the base and the cover has the locking device arranged to receive the snap-fit fixation.

[0022] This allows for a firm and/or detachable fixation of the cover with the base, when the snap-fit fixation is engaged with the locking device.

[0023] Advantageously, the cover is hingeably connected to the base. Advantageously, the head further has a film hinge arranged between the base and the cover. Advantageously, the film hinge may be incorporated into the head.

[0024] This allows to provide an efficient and easy to manufacture hinge, which improves the handling of the hybrid cable-tie in order to facilitate the mounting of the hybrid cable-tie onto the one or more cables. Further, this allows to avoid a protuberance (or a snag) around the head that may damage the harness, the cable or the lacing band itself.

[0025] Advantageously, the attachment portion is overmolded onto the base or glued with the base, or welded with the base.

[0026] This allows to provide an efficient and easy to manufacture attachment portion with the base, so as to ease the mounting of the hybrid cable-tie onto the one or more cables and allows for a better tensioning of the strap. The glue can be any type of adhesive.

[0027] Advantageously, the head has a first colour and the lacing band has a second colour, so as to define a colour code.

[0028] This allows to define a colour code so as to ease the recognition by the operator for the correct hybrid cable-tie to be applied on the corresponding type of cables (e.g. red colour of head for big cables, yellow colour of the head for small cables, black colour of the strap for power cables, green colour of the strap for signal cables, etc).

[0029] Advantageously, the hybrid cable-tie has a

RFID chip.

[0030] Advantageously, the RFID chip is arranged on the head.

[0031] This allows to identify or locate the hybrid cable-tie at the factory or when installed on the one or more cables.

[0032] Advantageously, one of the first protrusion and the second protrusion has at least one lateral recess, and the other of the first protrusion and the second protrusion has at least one lateral projection, arranged to fit with the at least one lateral recess when the cover is in the closed position.

[0033] Advantageously, the first protrusion has at least one lateral recess, and the second protrusion has at least one lateral projection arranged to fit with the at least one lateral recess when the cover is in the closed position.

[0034] Advantageously, the first protrusion has two lateral recesses, and each of the second protrusion and the third protrusion has a lateral projection arranged to fit with the lateral recesses when the cover is in the closed position.

[0035] Advantageously, the at least one lateral recess is triangular.

[0036] Advantageously, the lateral projection is triangular.

[0037] Advantageously, the first protrusion has at least one lateral projection and the second protrusion has at least one lateral recess to fit with the at least one lateral projection when the cover is in the closed position.

[0038] Advantageously, the first protrusion has two lateral projections, and each of the second protrusion and the third protrusion has a lateral recess arranged to fit with the lateral projections when the cover is in the closed position.

[0039] This allows to improve the clamping or the pinching of the strap.

[0040] Advantageously, the head and the strap are made of different materials, the head being preferably made of plastic and the strap being preferably made of textile.

[0041] Advantageously, the lacing band may have different shapes (braided flat, non braided flat and braided round, woven structure and the like).

[0042] Advantageously, the lacing band can be impregnated with different types of finish, including e.g. flame retardant or antifreeze, in order to optimize mechanical or chemical characteristics of the raw materials (that is to say base materials). Depending on the choice of the raw material and the impregnation, the lacing band and head may have different tensile strengths and can resist a specific range of temperature (low or high temperature resistance).

BRIEF DESCRIPTION OF THE DRAWINGS

[0043] Other features, purposes and advantages of the disclosure will become more explicit by means of reading the detailed statement of the non-restrictive embodi-

ments made with reference to the accompanying drawings.

Figure 1 shows a hybrid cable-tie according to one embodiment, having a cover in an open position.

Figure 2 shows the hybrid cable-tie with the cover in a closed position.

Figure 3 shows the hybrid cable-tie with the cover in the closed position, mounted on a harness, in perspective and cross-sectional view.

Figure 4 shows the hybrid cable-tie with the cover in the closed position, mounted on the harness, in elevation view.

Figure 5 shows the hybrid cable-tie with the cover in the closed position, mounted on the harness, in perspective view.

Figure 6 shows the hybrid cable-tie with the cover in the open position, while being mounted on the harness, in perspective view.

Figure 7 shows the hybrid cable-tie while the cover is being closed on the harness, in perspective view.

Figure 8 shows the hybrid cable-tie while the cover is open, in perspective view, in a second embodiment.

Figure 9 shows the hybrid cable-tie while the cover is represented in both opened and closed position, in perspective view, in a third embodiment,

Figure 10 shows a fourth embodiment of the hybrid cable-tie, in opened position,

Figure 11 shows the fourth embodiment in cross-sectional view, in closed position.

DETAILED DESCRIPTION

[0044] The present disclosure relates to a hybrid cable-tie 1 for tightening one or more cables (or wires or rope), or one or more harnesses. The harness may contain or overwrap the one or more cables. The harness may contain one or more cables, but it is also possible to place the hybrid cable-tie 1 directly onto the one or more cables (that is to say, without the need of the harness, which applies for all the figures and embodiments).

[0045] Figure 1 shows the hybrid cable-tie 1 having a head 2. The head 2 has a base 10 and a cover 20. The cover 20 is hinged to the base 10 so as to be movable between an open position and a closed position. The head 2 may have a film hinge 30, which is an example of a link between the base 10 and the cover 20.

[0046] The cover 20 is here represented in an open position. The open position refers to the position wherein the cover 20 is not pushed into the base 10, that is to say the cover 20 is not housed in a receiving portion 11 of the base 10.

[0047] The cover 20 has a first protrusion 21 arranged to fit between two protrusions 12, 12b of the base 10, when the cover 20 is closed onto the base 10. The two protrusions 12, 12b of the base 10, namely the second protrusion 12 and the third protrusion 12b, are arranged to form a recess therebetween, so that the first protrusion 21 on the cover 20 can be housed in the recess when the cover 20 is in the closed position. That is to say the recess forms a counter-shape facing the first protrusion 21 when the cover 20 is in the closed position.

[0048] The hybrid cable-tie 1 further has a lacing band 40 which is attached to the head 2. The lacing band 40 has a strap 41, and an attachment portion 42 connecting the strap 41 to the head 2. In other words, the strap 41 is a tail of the lacing band 40.

[0049] The strap 41 has a distal end, a proximal end, and an intermediate portion between the distal end and the proximal end. The proximal end of the strap 41 is closest to the attachment portion 42. The attachment portion 42 of the lacing band 40 is configured for connecting the lacing band 40 to the head 2. The strap 41 is configured to be received and clamped in the receiving portion 11 of the base 10. In particular, it should be noted that the strap 41, instead of being clamped at the distal end thereof, may be clamped in the intermediate portion of the strap 41 and thus a free end of the strap 41 protrudes freely from the head 2, as will be further explained with reference to Figure 3.

[0050] The receiving portion 11 of the base 10 is arranged to receive both the cover 20 and the strap 41. Preferably, the strap 41 is received in the receiving portion 11, onto the two protrusions 12, 12b of the base 10, and then the cover 20 is closed, so that the strap 41 is clamped between the cover 20 and the base 10, and is firmly maintained by the first protrusion 21 of the cover 20 and the two protrusions 12, 12b of the base 10.

[0051] The cover 20 may also have a flat portion 22, preferably on each side of the first protrusion 21, so as to cooperate with the protrusions 12, 12b, 21 and to better clamp and retain the strap 41, when the strap 41 is placed in the receiving portion 11 of the base 10 and the cover 20 is closed onto the strap 41.

[0052] The strap 41 is made of a different material to the head 2, hence the hybrid nature of the cable-tie 1. The strap 41 is preferably made out of textile in order to provide a cooperation with at least the first protrusion 21. That is to say, the strap 41 is preferably made of textile instead of plastic, so as to provide a softer material which can be better clamped by the protrusions 12, 12b, 21. The textile may comprise at least one of cotton, linen, hemp, wool or synthetic fibers such as polyester, nylon, aramid or acrylic, without being limited to this list.

[0053] The base 10 and the cover 20 may be made of

plastic. The same applies to the protrusions 12, 12b, 21. A coating may be applied to the protrusions 12, 12b, 21 (or any of them), such as an anti-wear coating or a gripping coating to improve the clamping of the strap 41. The coating may be made out of metal, plastic, rubber, polymer or any suitable material.

[0054] The cover 20 may be equipped with a snap-fit fixation 29 (also called snap-fit 29) arranged to be locked in a locking device 19 of the base 10. The snap-fit 29 may be a triangular protrusion and the locking device 19 may be a recess to receive the snap-fit 29.

[0055] The cable-tie of the present disclosure may be referred to as a hybrid cable-tie due to the fact that the strap 41 is made of textile (or woven material) and the head 2, namely the cover 20 and the base 10, is made of plastic.

[0056] Figure 2 shows the hybrid cable-tie 1 with the cover 20 in a closed position.

[0057] In the closed position, the snap-fit 29 is locked in the locking device 19.

[0058] In the closed position, the strap 41 is firmly maintained by the first protrusion 21 of the cover 20 and the two protrusions 12, 12b of the base 10, which form a chicane. In other words, the protrusions 12, 12b, 21 form a chicane, which means an obstacle on the racecourse or a path of the strap 41, when the strap 41 is placed in the receiving portion 11 and when the cover 20 is in the closed position.

[0059] Figure 3 shows the hybrid cable-tie 1 with the cover 20 in the closed position, mounted on a harness 100, in perspective and cross-sectional view.

[0060] The first protrusion 21 of the cover 20 is received between the second protrusion 12 and the third protrusion 12b of the base 10 so as to clamp the strap 41. In this manner, the strap 41 is tensioned between the attachment portion 42 on one side of the lacing band 40 and a clamped portion 44 of the lacing band 40, on the other side, so that finally the harness 100 can be maintained properly.

[0061] The attachment portion 42 may be glued onto the base 10, or overmolded with the base 10. In an embodiment, the attachment portion 42 may be welded onto the base 10. The attachment portion 42 can be fixed to the base 10 with any other suitable fixation system or assembly system, which could be either a demountable system or not.

[0062] Referring to Figure 3, a free end 43 of the strap 41, which is part of the intermediate portion of the strap 41, extends between the clamped portion 44 and the distal end of the strap 41. The free end 43 of the strap 41 may be used to release the strap 41 from the head 2 when the cover 20 is opened. In this manner, it is possible to easily dismount the hybrid cable-tie 1 from the harness 100.

[0063] Figure 4 shows the hybrid cable-tie 1 with the cover 20 in the closed position, mounted on the harness 100, in elevation view.

[0064] As explained above, the harness 100 may con-

tain one or more cables 101, but it is also possible to place the strap 41 directly onto the one or more cables 101 (that is to say, without the need of the harness 100, which applies for all the figures and embodiments).

[0065] Further, the lacing band 40 may be already cut at a suitable length (e.g. between 300 and 500 mm) so the operators save time. Indeed, the step of cutting the lacing band 40 may be removed. Moreover, the time to apply the lacing band is reduced, there is no need anymore to make a knot on the lacing band because the head 2 added and attached to the lacing band 40 maintains the lacing band 40 in place when the cover 20 is closed and prevents the lacing band 40 from unravelling. It eases the mounting, reduces the assembly time and bundles safely the cable harness 100 or the one or more cables 101. The correct clamping is obtained when the cover 20 of the head 2 is closed and the tension of the lacing band 40 is secured. Furthermore, the cover 20 of the head 2 helps the operator to maintain the lacing band 40 in the right position and to define the right tensile setting before closing the cover 20. This process can be done manually or with a tool. Finally, the head 2 is provided with rounded angles in order to avoid any damage to the cable.

[0066] The lacing band 40 may be wound around the harness 100 (one loop or more) and for the final loop, the lacing band 40 is inserted in the head 2 (to be more specific in the receiving portion 11 of the base 10), and the lacing band 40 is tensioned and the cover 20 is closed onto both the lacing band 40 and the base 10. The shape of the head 2 and the cover 20 are arranged to maintain the lacing band 40 in place when the cover 20 is in the closed position. The tension achieved by the hybrid cable-tie 1 enables the secure bundling of the one or more cables 101.

[0067] In this manner, the time to apply the lacing band 40 is at least halved compared to the lacing of the prior art. The risk of damaging the cables 101 with tools or scissors is reduced or avoided, and the application for the operator is easier.

[0068] Figure 5 shows the hybrid cable-tie 1 with the cover 20 in the closed position, mounted on the harness 100, in perspective view.

[0069] As explained before, the cover 20 is equipped with the snap-fit 29 arranged to be locked in the locking device 19 of the base 10. The snap-fit 29 may be a triangular protrusion and the locking device 19 may be a recess to receive the snap-fit 29.

[0070] Still further, a specific dye can be added in the formulation of the head 2 or the colours of the lacing band 40 (or lacing yarns) can be changed to have a colour code depending on the market and/or the application or to identify the product in the range or to identify the diameter of the cable 101 (or the set of cables 101 or each of the cable 101 of the set of cables) onto which it should be mounted.

[0071] The cable-tie 1 can also integrate additional functionalities such as an RFID chip to identify or locate

the cable-tie 1.

[0072] Figure 6 shows the cable-tie 1 with the cover 20 in the open position, while being mounted on the harness 100, in perspective view.

[0073] The operator can place the base 10 of the cable-tie 1 onto the harness 100. Then the operator can wind the strap 41 around the harness 100.

[0074] Figure 7 shows the cable-tie 1 while the cover 20 is being closed on the harness 100, in perspective view.

[0075] Then, the operator can place the strap 41 in the receiving portion 11 of the base 10, and then adjust the tension of the strap 41 to the desired value.

[0076] Then the operator can close the cover 20 onto the strap 41 and into the base 10. The snap-fit 29 is then locked in the locking device 19 of the base 10. The harness 100 having the one or more cables 101 therein is thereby clamped.

[0077] Figure 8 shows the hybrid cable-tie while the cover is open, in perspective view, in the second embodiment.

[0078] The reference numbers are kept as far as necessary, with reference to the other embodiments.

[0079] The first protrusion 21 is located on the cover 20 and defines two lateral recesses, preferably triangular recesses. The second protrusion 12 and the third protrusion 12b form a recess therebetween so as to house and face the first protrusion 21 when the cover 20 is in the closed position. The second protrusion 12 and the third protrusion 12b have lateral projections, preferably triangular, in order to fit with the lateral recesses of the first protrusion 21.

[0080] Figure 9 shows the hybrid cable-tie while the cover is being opened and closed, in perspective view, in a third embodiment.

[0081] The reference numbers are kept as far as necessary, with reference to the other embodiments.

[0082] The plain line box C shows the cover 20 in the closed position, fitted with the base 10; while the dotted line box O shows the cover 20 in the open position. The film hinge 30 is represented in the horizontal position when the cover 20 is in the open position, and wrapped when the cover 20 is in the closed position. The first protrusion 21 has two lateral projections (which could be either on one lateral side or on two lateral sides) in order to match with the two lateral recesses of the second protrusion 12 and third protrusion 12b of the base 10. As an alternative, the base 10 may have only one second protrusion 12 (i.e. without the third protrusion 12b). For sake of clarity, the strap 41 is hidden in Figure 9.

[0083] Finally, it is possible to place the first protrusion 21 on the base 10 and the two protrusions 12, 12b on the cover 20.

[0084] The head 2 and the strap 41 may be made out of any other suitable material, be adapted in shape and the design of the chicane may be adapted accordingly.

[0085] The film hinge 30 may be adapted in shape or material. Alternatively, it is possible to simply remove the

film hinge 30 and to replace it by an additional snap-fit fixation 29 and a locking device 19.

[0086] The chicane (and all recesses) may be adapted to become deeper, with more paths, or more tortuous, etc.

[0087] Figure 10 shows a fourth embodiment of the hybrid cable-tie, in opened position.

[0088] The head 2 has the base 10 and the cover 20, as mentioned above. The cover 20 is hinged to the base 10 so as to be movable between the opened position and the closed position (here represented in the opened position). The head 2 has the film hinge 30 between the base 10 and the cover 20.

[0089] The cover 20 may be equipped with the snap-fit fixation 29 (also called snap-fit 29) arranged to be locked in the locking device 19 of the base 10.

[0090] The cover 20 has the first protrusion 21 arranged to fit between the two protrusions 12, 12b of the base 10, when the cover 20 is closed onto the base 10. The two protrusions 12, 12b of the base 10, namely the second protrusion 12 and the third protrusion 12b, are arranged to form a recess therebetween, so that the first protrusion 21 on the cover 20 can be housed in the recess when the cover 20 is in the closed position.

[0091] The cover 20 may also have the flat portion 22, preferably on each side of the first protrusion 21, so as to cooperate with the protrusions 12, 12b, 21 and to better clamp and retain the strap 41 (not shown in figure 10), when the strap 41 is placed in the receiving portion 11 of the base 10 and the cover 20 is closed onto the strap 41.

[0092] The top surface of the first protrusion 21 may be equipped with an additional top protrusion 23d, in order to create an additional grip on the strap 41 combined with the chicane function. The top protrusion 23d may be in a shape of a pyramid or a diamond. Further, the top surface of the first protrusion 21 may also be equipped with half top protrusion 23h, which could be the half of the pyramid, preferably on each side of the top protrusion 23d.

[0093] Further, the cover 20 may be equipped with one or more recesses 28 arranged to fit with one or more projections 18 (e.g. longitudinal projections or keys), when the head 2 is closed. This allows to further improve the clamping.

[0094] Figure 11 shows the fourth embodiment in cross-sectional view, in closed position.

[0095] The head 2 is shown in closed position in figure 11. A safety distance SD may be provided between the top protrusion 23d and the recess formed by the two protrusions 12, 12b of the base 10, in order to allow place for the strap 41 (not shown in figure 11). In the same manner, a guiding distance GD may be provided between the first protrusion 21 and the two protrusions 12, 12b. An example of the value for the safety distance SD is 0.05 mm, while an example of the guiding distance GD is 0.22 mm or 0.23 mm.

[0096] The different embodiments can be combined

whenever possible.

[0097] It will be understood that various modifications and/or improvements obvious to the person skilled in the art may be made to the various embodiments of the disclosure described in the present description without departing from the scope of the disclosure defined by the appended claims.

Claims

1. A hybrid cable-tie (1) for tightening one or more cables, having:

- a head (2) having a cover (20) and a base (10), the cover (20) being movable between an open position and a closed position,
- a lacing band (40) having a strap (41) and an attachment portion (42) connecting the strap (41) to the head (2),

wherein :

- the head (2) is arranged to receive, between the base (10) and the cover (20), a portion of the strap (41), and
- one of the base (10) and the cover (20) has a first protrusion (21) and the other of the base (10) and the cover (20) has a counter-shape arranged in regard to the first protrusion (21) when the cover (20) is in the closed position so as to pinch the strap (41).

2. The hybrid cable-tie (1) according to claim 1, wherein the counter-shape has a facing portion in regard to the first protrusion (21) when the cover (20) is in the closed position, and a second protrusion (12) beside the facing portion so as to form a chicane, the facing portion being preferably flat.
3. The hybrid cable-tie (1) according to any one of claims 1 to 2, wherein the counter-shape has a recess in regard to the first protrusion (21) when the cover (20) is in the closed position.
4. The hybrid cable-tie (1) according to claim 3 in dependency on claim 2, wherein the counter-shape has the second protrusion (12) and a third protrusion (12b) so as to form the recess therebetween.
5. The hybrid cable-tie (1) according to any one of claims 2 to 4 in dependency on claim 2, wherein the lacing band (40) extends longitudinally, the head (2) defines a longitudinal portion arranged to receive the portion of the strap (41), and the first protrusion (21) and the second protrusion (12) extend in a width direction of the longitudinal portion.

6. The hybrid cable-tie (1) according to any one of claims 1 to 5, having at least one fixation system arranged to lock the cover (20) onto the base (10) in the closed position.

7. The hybrid cable-tie (1) according to claim 6, wherein the fixation system has a snap-fit fixation (29) and a locking device (19) and:

- one of the base (10) and the cover (20) has the snap-fit fixation (29), and
- the other of the base (10) and the cover (20) has the locking device (19) arranged to receive the snap-fit fixation (29).

8. The hybrid cable-tie (1) according to any one of claims 1 to 7, wherein the cover (20) is hingeably connected to the base (10).

9. The hybrid cable-tie (1) according to claim 8, wherein the head (2) further has a film hinge (30) arranged between the base (10) and the cover (20).

10. The hybrid cable-tie (1) according to any one of claims 1 to 9, wherein the attachment portion (42) is overmolded onto the base (10), glued with the base (10) or welded with the base (10).

11. The hybrid cable-tie (1) according to any one of claims 1 to 10, wherein the head (2) has a first colour and the lacing band (40) has a second colour, so as to define a colour code.

12. The hybrid cable-tie (1) according to any one of claims 1 to 11, having a RFID chip.

13. The hybrid cable-tie (1) according to claims 12, wherein the RFID chip is arranged on the head (2).

14. The hybrid cable-tie (1) according to any one of claims 1 to 13 in dependency on claim 2, wherein

- one of the first protrusion (21) and the second protrusion (12) has at least one lateral recess, and
- the other of the first protrusion (21) and the second protrusion (12) has at least one lateral projection arranged to fit with the at least one lateral recess when the cover (20) is in the closed position.

15. The hybrid cable-tie (1) according to any one of claims 1 to 14, wherein the head (2) and the strap (41) are made of different materials, the head (2) being preferably made of plastic and the strap (41) being preferably made of textile.

Fig. 1

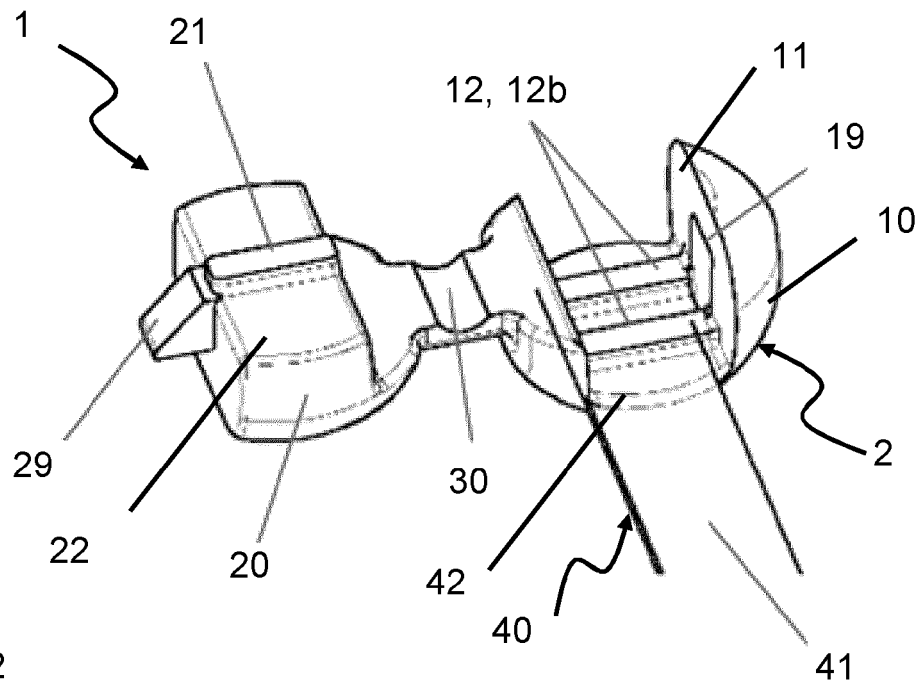


Fig. 2

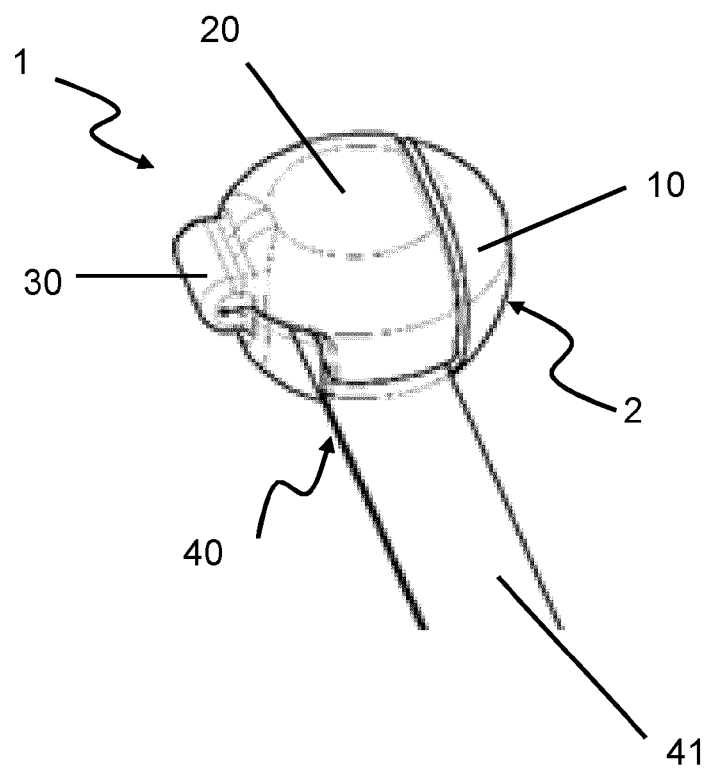


Fig. 3

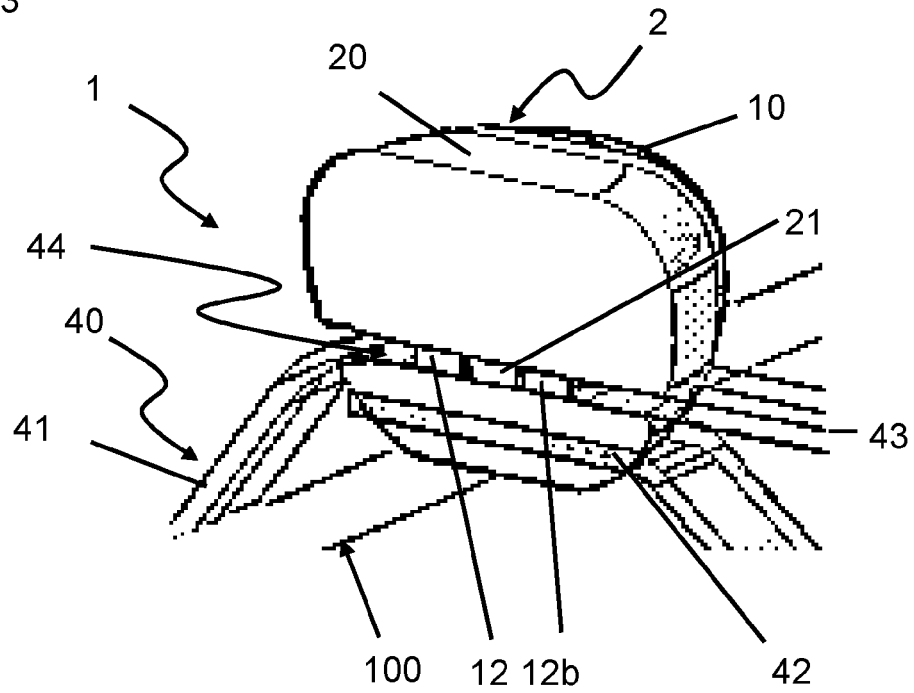


Fig. 4

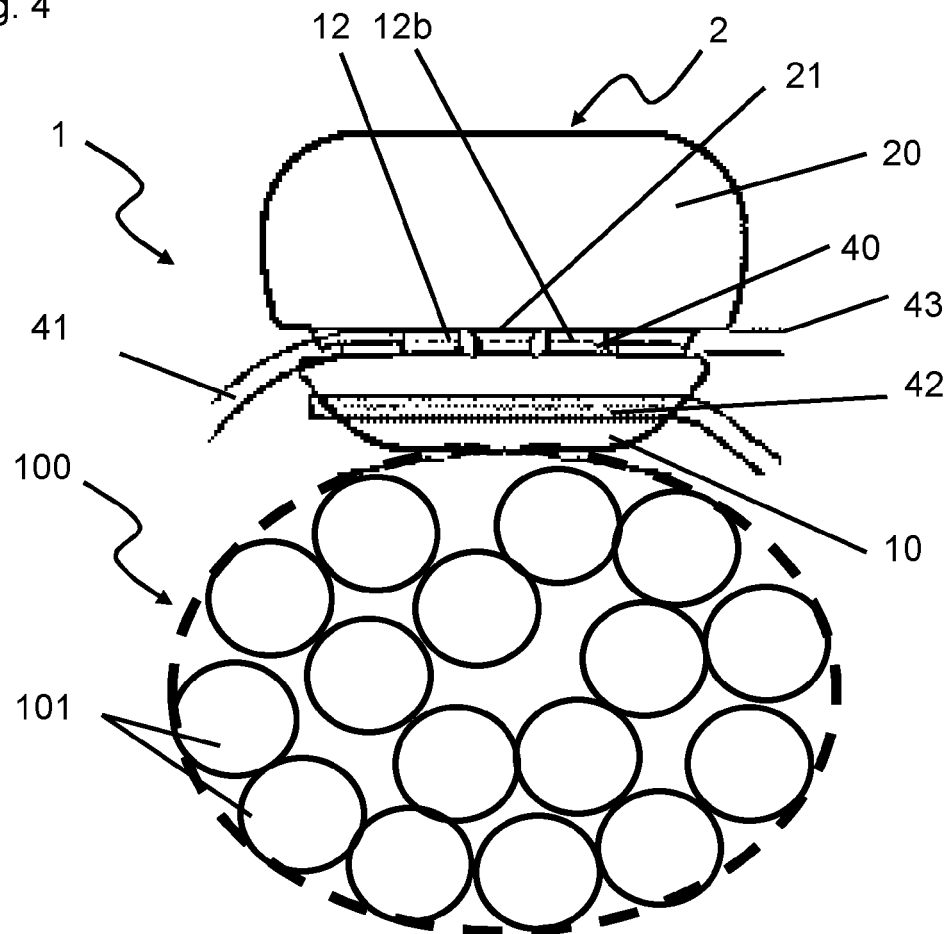


Fig. 5

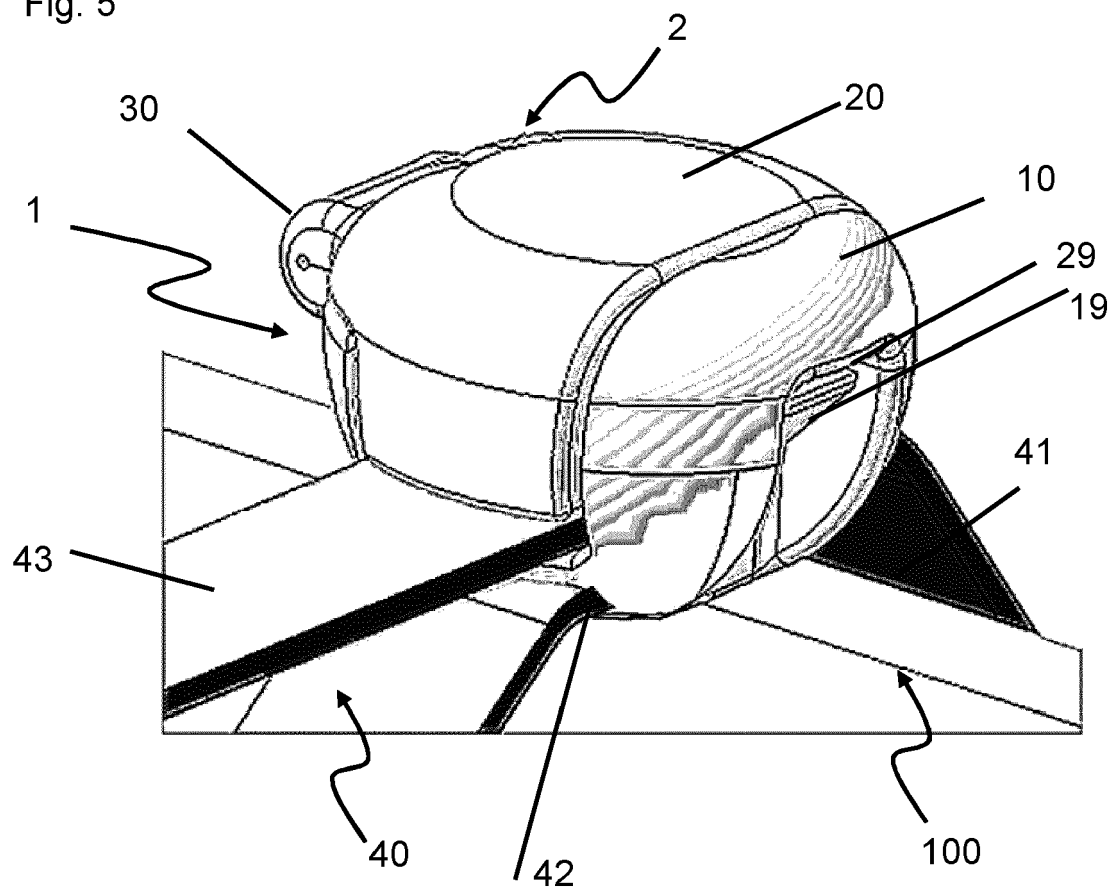


Fig. 6

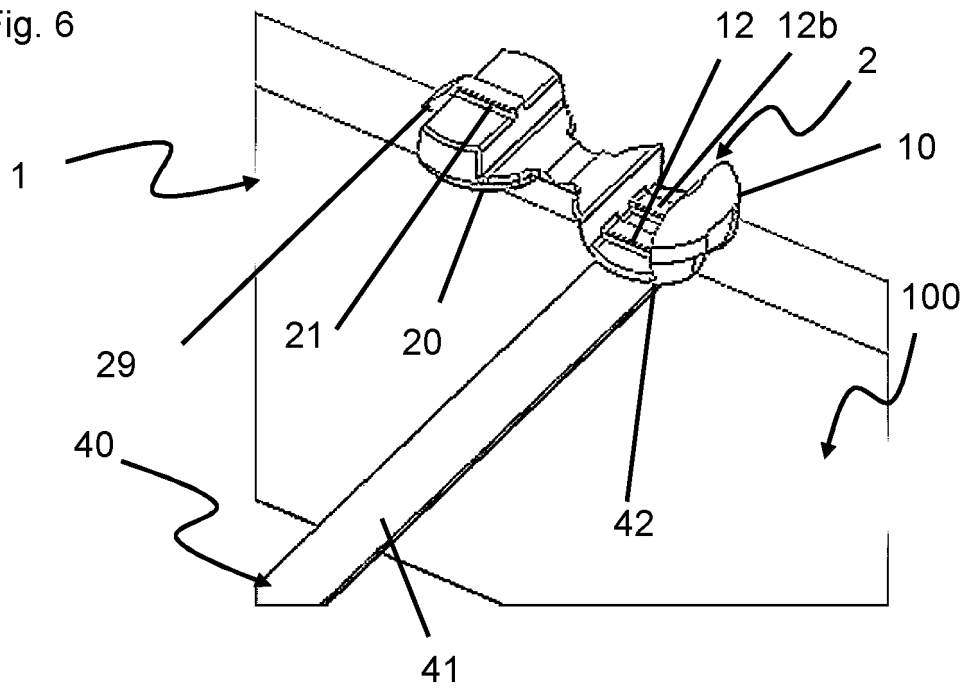


Fig. 7

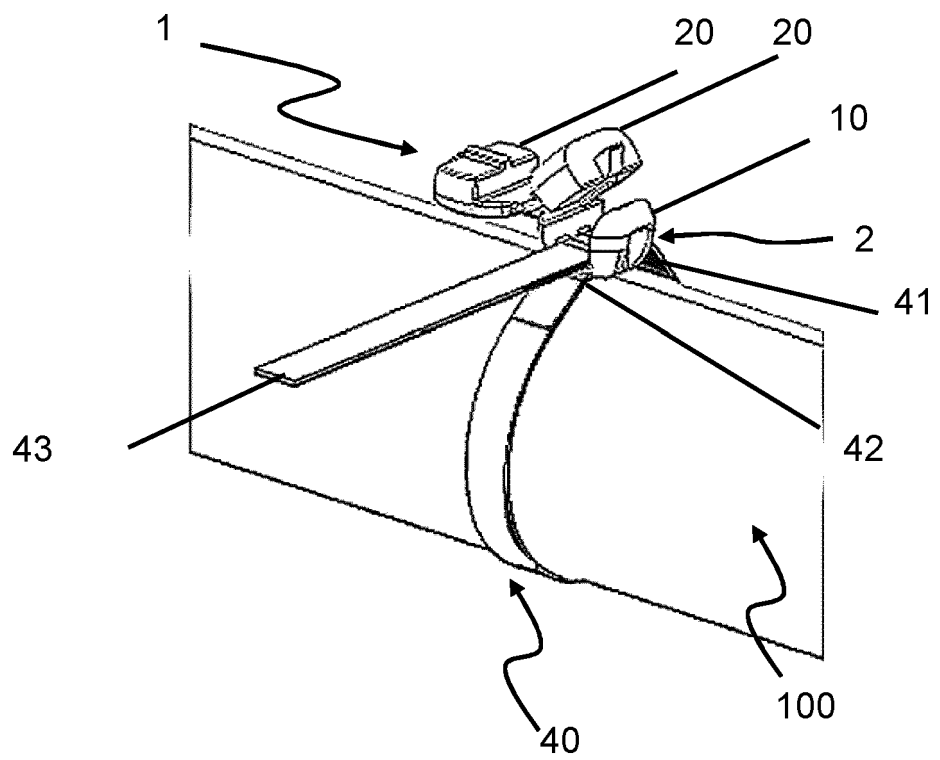


Fig. 8

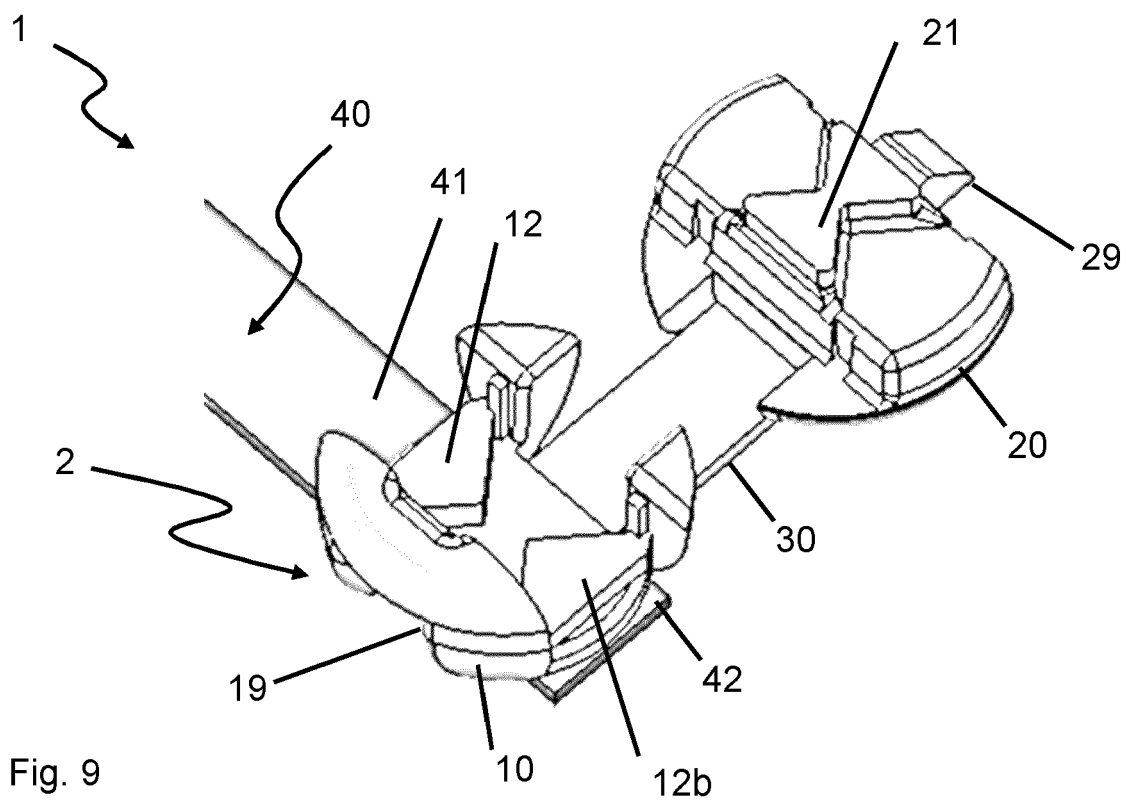


Fig. 9

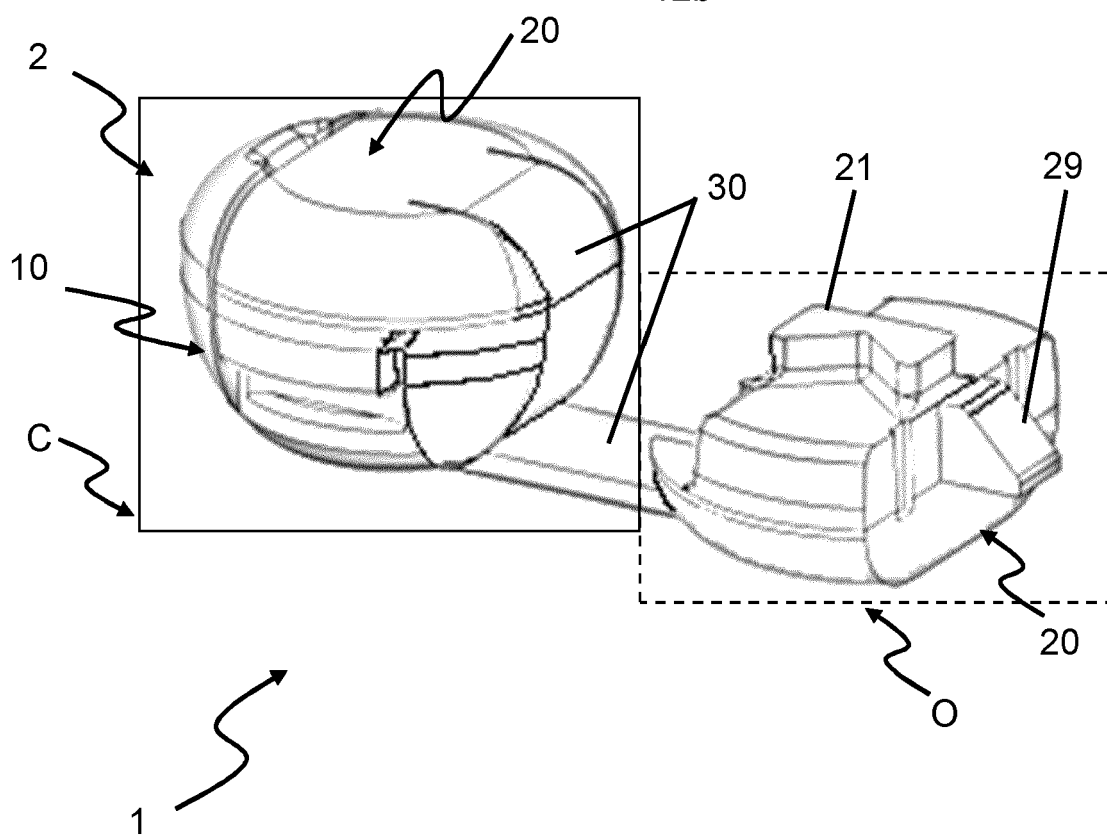


Fig. 10

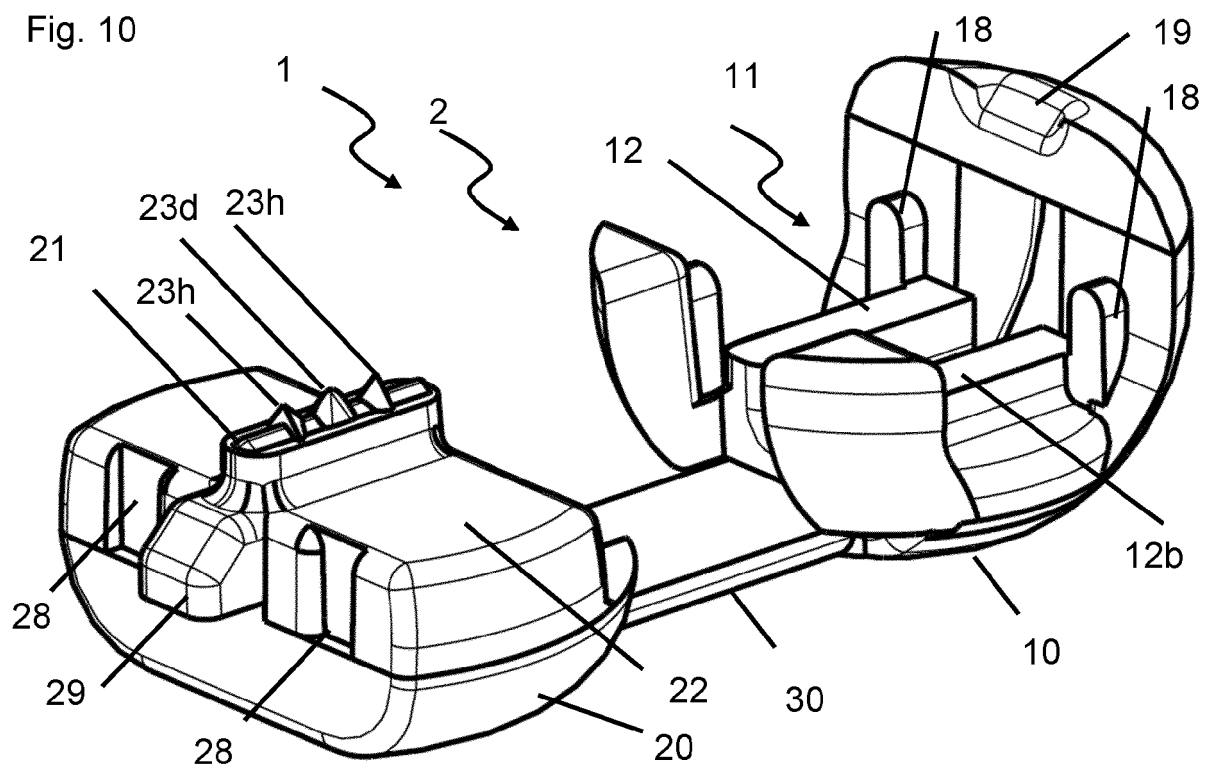
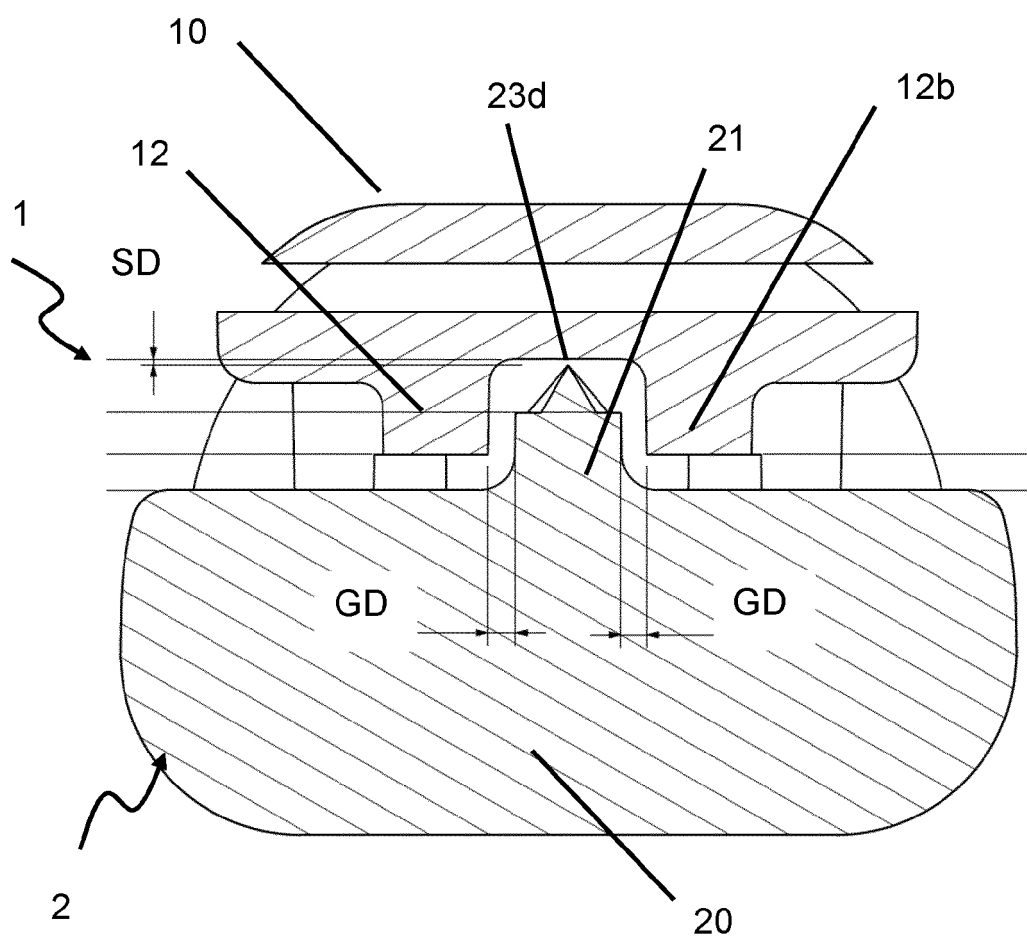


Fig. 11





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