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(54) **TACK BUTTON HAVING REMOVABLE PIN AND BASE PART**

DRUCKKNOPF MIT ABNEHMBAREM STIFT UND BASISTEIL

DISPOSITIF DE SÉCURITÉ À BOUTON DOTÉ D'UNE BROCHE AMOVIBLE ET D'UNE PARTIE DE BASE

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Description

Technical Field of the Invention

[0001] The present invention relates to a tack button for attaching a button to a substrate, more specifically to a tack button having respectively detachably attachable base part and pin.

Background of the Invention

[0002] In the art, it is well known that a button is attached by interposing a substrate such as the flexible material comprised in a garment fabric between a button body and a solid tack button. In particular, the button is substantially constituted by two parts: the button body and the tack button with its tip portion to be inserted into a concave part of the button body.

[0003] Traditional tack buttons are integrally formed and once a button is attached for the first time, the button body can no longer be separated from the substrate without the risk of damaging it. Since buttons are not designed to be removed, it makes any recycling process problematic for separate and similar parts. When the necessity arises for the tack button to be removed from the button body, the removal requires the stem of the pin to be forcibly pulled out of the button body. Since the tip portion of the tack button is already deformed or otherwise irrevocably inserted in the button body, the work of removing the tack button is excessively burdensome. Moreover, the button may not detach even if the user applies excessive force.

[0004] Among others, one of the prior art disclosures in the technical field of the present invention can be referred to as US 2014017512 A1, which defines an integral tack button having a projection projecting concentrically through the middle of a disk-shaped base. Similarly, EP 0733315 A1 proposes an integral male component as a tack button comprising a dome-shaped part, an intermediate tubular element, and a stem portion.

[0005] EP 2361522 A1 discloses a pression button of a type comprising a female portion including an active female element having a seat for engagement in an annular groove of an active male element having moreover a male portion having an active male element and a clamping element including a contoured annular body for clamping to an under-head portion of the active male element. This document discloses a tack button according to the preamble of claim 1.

[0006] US 2018184766 A1 discloses a swivel clip for decorating a strap is provided. The swivel clip comprises a pin and an attachment. The pin has a front/exposed face, a rear face and a stud projecting from the rear face. The attachment comprises an attachment body with a hole sized and configured to tightly fit the stud therein. KR102097901 B1 discloses a magnetic button in which a surface exposed to the outside has a flat surface having no hole or groove, and a magnet is provided at the internal center, so button coupling is significantly conveniently performed and the surface is smooth.

[0007] Therefore, there is a need for a durable tack button which is easily releasable when a need for removal arises.

Objects of the Invention

[0008] A primary object of the present invention is to overcome the abovementioned shortcomings of the prior art.

[0009] A further object of the present invention is to provide a tack button that allows considerable production flexibility and interchangeability of its parts.

[0010] A further object of the present invention is to provide a tack button that enables the tack button to be detached from the substrate to which it is attached, whilst maintaining the traditional attaching method. The proposed tack button is associated therewith for securing the button to a substrate or fabric such as bags, saddle, student uniforms, jeans, sportswear and the like.

[0011] A further object of the present invention is to provide a tack button that is constructively simple and easy to assemble and whose production costs are competitive with respect to conventional rivet-type tack buttons.

[0012] A further object of the present invention is to provide a button which may be readily attached to and detached from a flexible material such as a substrate or fabric.

[0013] A further object of the present invention is to provide a releasable button that can be attached with known technologies without substantial modifications to any facilities already provided.

[0014] A further object of the present invention is to provide a button which may be readily capable of simple repair or replacement.

[0015] Another object of the present invention is to provide a reliable, simple, and low-cost button for a robust yet detachable engagement between a tack button and a button body; without damaging the button or the fabric or either.

Summary of the Invention

[0016] The invention is defined in the appended claims.

Brief Description of the Figures

[0017] The figures, a brief explanation of which is herewith provided, are solely intended for providing a better understanding of the present invention and are as such not intended to define the scope of protection or the context in which said scope is to be interpreted in the absence of the description.

Fig. 1(a) is a perspective view of a complete tack button, according to a first embodiment of the

present invention prior to attachment to a substrate.
Fig. 1(b) is a top view of the tack button shown in Fig. 1(a).
Fig. 1(c) is a side perspective view of the tack button shown in Fig. 1(a).
Fig. 2(a) is a section view (Y-Y) taken from the depiction provided in Fig. 1(b).
Fig. 2(b) is a section view (X-X) taken from the depiction provided in Fig. 1(b).
Fig. 3(a) is a side perspective view of a pin of the tack button, according to the first embodiment of the present invention.
Fig. 3(b) is a cross-sectional view of the pin of the tack button shown in Fig. 3(a), according to the present invention.
Fig. 4(a) is a perspective view of a base part of the tack button, according to the first embodiment of the present invention.
Fig. 4(b) is a top view of the base part of the tack button shown in Fig. 4(a).
Fig. 4(c) is a section view (Y-Y) taken from the depiction provided in Fig. 4(b).
Fig. 4(d) is a section view (X-X) taken from the depiction provided in Fig. 4(b).
Fig. 5(a) is a perspective view of the button having the tack button, according to the first embodiment of the present invention.
Fig. 5(b) is a side perspective view of the button shown in Fig. 5(a).
Fig. 6(a) is a top view of the button before being applied to a substrate, according to the first embodiment of the present invention.
Fig 6(b) is a section view (Y-Y) taken from the depiction provided in Fig. 6(a) illustrating a state where the button shown in Fig.6(a) is applied to a substrate.
Fig 6(c) is a section view (X-X) taken from the depiction provided in Fig. 6(a).
Fig. 7 is a perspective view of the button in which the tack button is fitted, according to a second embodiment of the present invention.
Fig. 8(a) is a perspective view of the base part of the tack button, according to the second embodiment of the present invention.
Fig. 8(b) is a top view of the base part of the tack button shown in Fig. 8(a).
Fig. 9(a) is a side perspective view of the tack button, according to the second embodiment of the present invention.
Fig. 9(b) is another side perspective view of the tack button, according to the second embodiment of the present invention.
Fig. 9(c) is a bottom view of the tack button, according to the second embodiment of the present invention.
Fig. 9(d) is a section view (Y-Y) taken from the depiction provided in Fig. 9(c).
Fig. 9(e) is a section view (X-X) taken from the depiction provided in Fig. 9(c).
Fig. 10(a) is a side perspective view of a tack button applied to a button, according to a third embodiment of the present invention.
Fig. 10(b) is a perspective view of the button shown in Fig. 10(a).
Fig. 11(a) is a section view of the button, according to the third embodiment of the present invention.
Fig. 11(b) is a section view of the button, wherein the button is applied to a substrate, according to the third embodiment of the present invention.

Detailed Description of the Invention

[0018] The present invention proposes a button (100) and a tack button (10, 110, 210) for attaching a button (100) to a substrate (200) or fabric. The proposed tack button (10, 110, 210) is substantially constituted by two parts: a base part (20, 120, 220) and a pin (30, 130, 230) adapted to detachably engage with said base part (20, 120, 220).

[0019] According to the present invention, the tack button comprises a pin (30, 130, 230); and a base part (20, 120, 220) for detachably mounting the pin (30, 130, 230), said pin (30, 130, 230) being adapted to project perpendicularly from the base part (20, 120, 220) wherein the base part (20, 120, 220) and the pin (30, 130, 230) are independent of each other. The tack button (10, 110, 210) is detachable from the substrate (200) to which it is attached while preserving the traditional method of button attachment.

[0020] The pin (30, 130, 230) of the tack button (10, 110, 210) has an engaging base portion (33, 133, 233), a stem portion (32, 132, 232) extending from the engaging base portion (33, 133, 233), and a tapering tip portion (31, 131, 231) distal to the engaging base portion (33, 133, 233) for perforating the substrate (200). Each portion of the pin (30, 130, 230) tapers towards the tip portion (31, 131, 231) where the tip portion (31, 131, 231) is configured to pass through the substrate (200) to which the button will be attached. The gradient of the taper of the stem portion (32, 132, 232) is less than the gradient of the other two portions. As in common usage, the pin (30, 130, 230) of the tack button (10, 110, 210) is adapted to be deformed when pressed. In another usage, the pin (30, 130, 230) of the tack button (10, 110, 210) is adapted to bulge when pressed. On attachment to the substrate (200), the base part (20, 120, 220) cooperates with the pin so as to fix the substrate (200) between the deformed or bulged distal end of the pin (30, 130, 230) and the base part (20, 120,220). The deformed or bulged distal end of the pin (30, 130, 230) may be covered by a button body (40, 140) or the distal end of the pin (30, 130, 230) deformed or undeformed, may be inserted into a cooperating insert, to form the tack button (10, 110, 210). On attachment, the stem portion (32, 132, 232) may be substantially surrounded by the substrate (200) in the plane of the substrate (200).

[0021] The base part (20, 120, 220) is formed as a

single-piece and is arranged in such a way that the pin (30, 130, 230) can be fitted detachably to the base part (20, 120, 220). The base part (20, 120, 220) is arranged for detachably mounting a pin (30, 130, 230) for forming the tack button (10, 110, 210). The proposed base part (20, 120, 220) comprises a pin receiving portion (23, 123, 223) for receiving the pin (30, 130, 230); and at least one removal hole (21, 121, 221) arranged to receive a part of a removal tool. The base part (20, 120, 220) and the pin (30, 130, 230) are disposed on the centre axis (Z) of the tack button (10, 110, 210) wherein the pin receiving portion (23, 123, 223) is also arranged coaxially with the centre axis (Z). In a possible embodiment, the cavity(s) (24, 124, 224) and the pin receiving portion (23, 123, 223) are joined by a respective narrowed passageway (27, 127, 227) so that said passageway (27, 127, 227) gives flexibility to the base part (20, 120, 220) when attaching or detaching the pin (30, 130). Each adjacent cavity (24, 124, 224) passes through the base part (20, 120, 220) and can be surrounded by a flexible or malleable periphery within which the cavities (24, 124, 224) are substantially formed as holes and do not protrude beyond the circumference of the base part (20, 120). It will be appreciated that the entire base part (20, 120, 220) may be made of a malleable material. Said base part (20, 120, 220) can be of any shape. In some configurations, the pin receiving portion (23, 123, 223) and the base part (20, 120, 220) will not coincide with the centre axis (Z) of the tack button (10, 110, 210).

[0022] During the assembly process of the tack button (10, 110, 210), the pin (30, 130, 230) is inserted through the elongated pin receiving portion (23, 123, 223) such that the pin (30, 130, 230) is brought in a position where the engaging base portion (33, 133, 233) of the pin (30, 130, 230) engages with the elongated pin receiving portion (23, 123, 223). When the pin (30, 130, 230) is placed, pressure is applied to the base part (20, 120, 220) from at least one side of the cavity (24, 124, 224) so that the elongation of the pin receiving portion (23, 123, 223) is at least partly eliminated, that is to say, all passageways (27,127, 227) are substantially closed and the engaging base portion (33, 133, 233) is held within the pin receiving portion (23, 123, 223).

[0023] The pin receiving portion (23, 123, 223) of the base part (20, 120, 220) may be tapered from the upper surface to the lower surface such that when the engaging base portion (33, 133, 233) of the pin (30, 130, 230) is held within the pin receiving portion (23, 123, 223) the taper of the engaging base portion (33, 133, 233) and the taper of the pin receiving portion (23, 123, 223) cooperate to help retain the pin (30, 130, 230) from travelling further in the direction of the taper beyond the base part (20, 120, 220).

[0024] Starting from Fig. 1(a) to Fig. 6(c), the first embodiment of the tack button (10) is depicted. Starting from Fig. 7 to Fig. 9(f), the second embodiment of the tack button (110) is depicted. Lastly, starting from Fig. 10(a) to 11(b), the third embodiment of the tack button (210) is depicted. In the first embodiment, the base part (20) may have two cavities (24) which are symmetrically opposed to each other with respect to the pin (30, 130) and extend on a vertical axis (Y) of the base part (20). Preferably, the base part (20) is slightly thicker than the engaging base portion (33) at least in areas surrounding the elongated pin receiving portion (23). Referring to Fig. 4(b), two passageways (27) are substantially closed.

[0025] Referring to Fig. 1(a) and (b), according to the first embodiment of the invention, the base part (20) has the pin receiving portion (23) formed in a middle portion thereof for receiving the pin (30), preferably concentrically. The pin receiving portion (23) is formed when it is closed with the pin (30) within the pin receiving portion (23), prior to this attachment the pin receiving portion (30) is elongated. The pin receiving portion (23) of the base part (20) joins with at least one adjacent emptied cavity (24) formed in the proximity of the pin receiving portion (23). The elongation of the elongated pin receiving portion (23) can be obtained by shaping the undeformed base part (20) so that at least one emptied cavity (24) extends uninterrupted to the elongated pin receiving portion (23). Referring to Fig. 2(a) and 2(b), in the first embodiment, the pin receiving portion (23) is formed as a hole through which the stem portion (32) and the tip portion (31) of the pin (30) have passed therethrough.

[0026] According to the first embodiment of the invention, the pin receiving portion (23) has an inwardly and radially extending tapered portion (25) arranged to engage with the engaging base portion (33) of the pin (30). Referring to 3(a) and 3(b), a lower face of a stem portion (32) of the pin (30) extends inwardly at a border between the stem portion (32) and the engaging base portion (33) and an upper face of the engaging base portion (33) extends inwardly at a border between the engaging base portion (33) and the stem portion (32) so that an annular recess (35) with an inner diameter smaller than a diameter of the stem portion (32) is formed. In other embodiments, the annular recess (35) may be comprised entirely within the engaging base portion (33) or entirely within the stem portion (32) of the pin (30). This annular recess (35) is formed as the merging of two inclined slope portions wherein the outer periphery of the annular recess (35) substantially coincides with the proximal tapered portion (25) of the base part (20). Other acceptable configurations, such as a curved or inclined annular recess (35) are possible. The base portion (33) of the pin (30) has a greater transverse cross-section with respect to the stem portion (32). Referring to Fig. 2(b), the base portion (33) is arranged to be provided downward the annular recess (35) to firmly clamp the pin (30) wherein the pin (30) extends along the centre axis (Z). Again, referring to Fig. 3(a) and 3(b), the annular recess (35) is shaped and dimensioned such that when the pin (30) is contained in the pin receiving portion (23), the radially extending tapered portion (25) of the pin receiving portion (23) and the annular recess (35) engage each other. The tapered portion (25) can be formed as a male part, and

the annular recess (35) can be formed as a corresponding female part providing a slight interference fit. In a further possible embodiment, the position and the location of the male and female parts can be exchanged. Each of the tapered portions (25) and the annular recess (35) may not be continuous.

[0027] As can be seen in Fig. 2(a) and 2(b), when the pin (30) is fitted, the engaging base portion (33) does not pass through the pin receiving portion (23) where a shoulder (34) of the base part (33) has a greater diameter than the tapered portion (25). The shoulder (34) is substantially circumferentially tapered inwards towards the upper portion of the engaging base portion (33) wherein the shoulder (34) is formed in the proximity of the annular recess (35). The tapered portion (25) also engages with the shoulder (34) of the engaging base portion (33), as shown in Fig. 2(b).

[0028] With this arrangement, the pin (30) is fixed to the pin receiving portion (23) in substantially retained condition. The annular recess (35) of the engaging base portion (33) may also allow for the material of the substrate (200) displaced during the attaching process to escape into the engagement gap (28) above the annular recess (35) with respect to the centre axis (Z) for reducing the tension on the button (100). Referring to Fig. 6b, when the tack button (100) is used, an engagement gap (28) next to the tapered portion (25) is formed between the substrate (200) and the base part (20). The tapered portion (25) is inwardly inclined and radially extends with respect to the centre axis (Z). Such inclination of the tapered portion (25) and the substrate (200) form the circular-shaped engagement gap (28) for a better displacement during the attaching process.

[0029] According to the present invention, advantageously, the tack button (10, 110, 210) may be detached by the user, such as when the tack button (10, 110, 210) or the garment is intended for recycling, the tack button (10, 110, 210) can be removed using a scissor-like removal tool (i.e., needle-nose pliers). Such removal tool may have a pair of upper and lower arms that are pivotally supported by a shaft. Referring to Fig. 1(b), 8(a) and 10(b), the base part (20, 120, 220) is generally disc-shaped and has at least one removal hole (21, 121, 221) arranged to receive the removal tool. The removal hole (21, 121, 221) is preferably formed as a through-hole extending through the thickness of the base part (20, 120, 220).

[0030] In a further preferred embodiment, the disc-shaped base part (20, 120, 220) has two removal holes (21, 121, 221) spaced apart from each other for receiving corresponding jaws of the scissor-like removal tool. Such a removal tool can have a partially openable pair of jaws for placing each corresponding jaw in each removal hole (21, 121, 221). Moreover, the removal tool may have a first jaw and a second jaw movable with respect to one another. The presence of the removal hole (21, 121, 221) allows the base part (20, 120, 220) to be easily broken or deformed via the removal hole (21, 121, 221). In a possible usage, the removal tool is first placed and then opened for widening/enlarging the pin receiving portion (23, 123, 223) such that the pin receiving portion (23, 123, 223) may substantially resemble an elongated pin receiving portion (23, 123, 223), wherein the passageways (27,127,227) may become open. Other possible methods of deformation are also possible. In another possible usage, two separate removal tools such as two pliers or two hooks can also be used to deform/widen the base part (20, 120) and allow the pin (30, 130) to pass through.

[0031] In the first embodiment of the tack button (10), the base part (20) can have two removal holes (21) spaced apart from each other and two cavities (24) spaced apart from each other wherein an axis between the removal holes (21) is perpendicular to an axis between the cavities (24). These two axes form a cross with the pin (30) in the centre, as shown in Fig. 1(b). Thus, during attaching and detaching the pin (30), the base part (20) adaptly absorbs the resulting stress. The base part (30) is also more resilient under pressure or strain with the spaced apart removal holes (21) and cavities (24). The jaws of the removal tool can be opened after being placed in the corresponding removal holes (21) which shall widen the pin receiving portion (23) or otherwise disrupt the structure of the base part (20) allowing the pin (30) to pass through the base part (20) and potentially also the substrate (200). With this arrangement, the tack button (10) can be removed from the substrate (200) and both parts of the tack button (10) or the substrate (200) or both may be prepared for recycling or for other purposes. The pin receiving portion (23) is arranged to keep the pin (30) firmly and is also arranged to let the pin (30) pass through by widening in a radial direction thereof when pressure is applied from at least one removal hole (21), preferably two removal holes (21). This is possible because the engaging base portion (33) has a greater diameter than the adjacent stem portion (32).

[0032] It will be appreciated that a removal tool as described may also be inserted as described into the removal holes (21) in order to allow the closing of the passage between the elongated pin receiving portion (23) and the cavity(s) (24) so as to retain the pin (30) in the base part (20) by drawing the jaws of the removal tool closer to each other.

[0033] In the usage, when the assembled pin (30, 130, 230) and the base part (20, 120, 220) are pressured towards the substrate (200) this interlocks the substrate (200) between the base part (20, 120, 220) and the deformation of the tip of the pin (31,131, 231) and so aids resistance to movement through the material of the substrate (200), but once the pin receiving portion (23, 123, 223) of the base part (20, 120, 220) has been deformed and the pin (30, 130, 230) is released therefrom, the pin (30, 130, 230) may more easily be pulled away from the substrate (200).

[0034] Referring to Fig 1(b), the base part (20) has two spaced apart removal holes (21) and has two cavities

(24) in communication with the pin receiving portion (23). Moreover, the base part (20) has at least one, preferably at least two, grooves (22) extending within the base part (20) in a sloped manner. A pair of grooves (22) form a major arc-shaped recess in the base part (20). Such arrangement also enhances the flexibility of the base part (20) and so eases the attachment of the pin (30) to the base part (20) and the deformation of the base part (20). Other shapes and combinations of shapes of one or more grooves (22) may be used to enhance flexibility.

[0035] In the first and third embodiments, one or more cavities (24, 224) can have an inner periphery surrounded at least partly by a malleable material. In a further embodiment, the inner periphery of the cavities (24, 224) and the inner periphery of the pin receiving portion (23, 223) can be fully surrounded by the malleable material. Said malleable material has the ability to deform under compressive stress. Such malleable material gives enough elasticity to the base part (20, 220) when attaching and detaching the pin (30, 230). In a possible embodiment, cavities (24, 224) and the inner periphery of the pin receiving portion (23, 223) are not surrounded by the malleable material wherein only the cavities (24, 224) adjacent to the pin receiving portion (23, 223) give sufficient flexibility to the base part (20, 220).

[0036] Referring to Figs. 8(a) to 9(f), the proposed second embodiment of the tack button (110) has a plate-like base part (120) with at least one removal hole (121) arranged for receiving a part (i.e., jaw) of the removal tool. The removal hole (121) has a preferably circular cross-section. In a possible second embodiment, the base part (120) has two removal holes (121) preferably symmetrically opposed to each other with respect to the pin receiving portion (123).

[0037] In the second embodiment, the base part (120) has an open cavity as a receiving section (126) adjacent to the elongated pin receiving portion (123) which is not enclosed and the pin (130) may pass along this cavity into the elongated pin receiving portion (123). Two spaced-apart removal holes (121) are formed at the base part (120) such that when a removal tool is used, the removal holes (121) are extended away from each other by a removal tool, and the deformed shape of the pin receiving portion (123) allows the pin (130) to pass thereof. Referring to Fig. 8a, the spaced-apart removal holes (121) are positioned at the base part (120) so that the receiving section (126) passes between removal holes (121). When the pin (130) is properly placed by passing through the receiving section (126) to engage in the pin receiving portion (123), the pin receiving portion (123) may partly widen and then return to its initial position. After the pin (130) is properly placed, the receiving section (126) is closed again until a detachment of the tack button (110) is being attempted. In a possible embodiment, it need not be necessary to widen the pin receiving portion (123) in order for the pin (130) to pass through, further pressure applied to the pin (130) beyond that of common usage may itself be sufficient to allow the pin (130) to pass through the pin receiving portion (123) due to the malleability of the pin (130) or the material surrounding the pin receiving portion (123) or both. In a further embodiment, the pin receiving portion (123) may elastically widen in a circumferential direction thereof. The pin receiving portion (123) is provided adjacent to at least one cavity (124) which is an elongated hole for giving flexibility to the pin receiving portion (123). In the removal process of the second embodiment, additionally, to the manner of removal of the first embodiment, the removal tool can be opened after placing the corresponding jaws of the removal tool to the corresponding removal holes (121). Thus, the width between the removal holes (121) can be substantially increased to allow the pin (130) to pass through the receiving section (126).

[0038] In the second embodiment, the cavity (124) can be formed as at least a minor arc-shaped recess with rounded ends. The cavity (124) and the pin receiving portion (123) are joined by a narrowed passageway (127) so that the cavity (124) gives flexibility to the base part (120). The passageway (127) opening into the cavity (124) widens as it extends further from the centre axis (Z) of the tack button (110). In the second embodiment, the pin (130) has a substantially outwardly inclined engaging base portion (133). Referring to Fig. 9a and 9b, the engaging base portion (133) has a cylindrically-shaped inner portion (136) where an annular recess (135) is formed around the inner portion (136). The annular recess (135) extends perpendicular to the centre axis (Z) for receiving the pin receiving portion (123) of the base part (120). The engaging base portion (133) has also a diameter greater distal the stem portion (132) than that adjacent to the stem portion (132) so that the pin (130) can be pulled off through the substrate (200).

[0039] In the second embodiment, referring to Fig. 8(a) and 8(b), the base part (120) has an inwardly opening receiving section (126) extending to the pin receiving portion (123) for receiving the annular recess (135) of the pin (130). The engaging base portion (133) of the pin (130) has a substantially reduced cross-section where the annular recess (135) forms a cylindrical part of the pin (130). The pin receiving portion (123) similarly can be at least partly surrounded by a malleable material, resulting in the width of the pin receiving portion (123) being less than the width of the annular recess (135) of the pin (130). Accordingly, once the pin (130) is passed from the receiving section (126) to the pin receiving portion (123), the base part (120) elastically widens and returns to its original shape keeping the pin (130) firmly therein. In a possible embodiment, reversely, the annular recess (135) of the pin (130) is at least partly surrounded by a malleable material, resulting in the width of the annular recess (135) of the pin (130) being greater than the pin receiving portion (123) such that once the pin (130) is passed from the receiving section (126) to the pin receiving portion (123), the pin (130) elastically widens and returns to its original shape. In a possible embodiment, the pin (130) or the base part (120) is not surrounded by

any malleable material, only the cavity (124) is arranged in such a way such that the base part (120) is sufficiently flexible for firmly holding and releasing the pin (130). Alternatively, either the base part (120) or the pin (130) may be entirely made of malleable material. As in the first embodiment, when the tack button (110) is pressed against the button body (40), a tip portion (131) of the pin (130) is deformed and bulged outwardly for engaging the button body (40).

[0040] Referring to Fig. 8(a), the receiving section (126) has a width (W1) which is less than the diameter of the annular recess (135) of the pin (130) such that once the pin (130) is passed from the receiving section (126) to the pin receiving portion (123), the pin receiving portion (123) elastically widens and returns to its original shape. The base part (120) has at least two removal holes (121) spaced apart from each other for receiving corresponding parts of the removal tool. In a possible usage, the removal holes (121) are moved away from each other by the removal tool, thus elastically widening the pin receiving portion (123) allowing the pin (130) to pass therefrom and through the receiving section. In another possible usage, the removal holes (121), reversely, are brought closer to each other by the removal tool; with this arrangement, the pin receiving portion (123) partly widens and allows the pin (130) to pass therethrough.

[0041] Referring to Figs 10(a) to 11(b), a third embodiment of the tack button (210) and the button (100) are shown. The proposed tack button (210) mainly comprises a respectively removably attachable base part (220) and pin (230). Similarly, such parts are produced separately and then assembled together. Referring to Fig. 11(a) and Fig. 11(b), the pin (230) has an engaging base portion (233), a stem portion (232), and a tapering tip portion (231) distal to the engaging base portion (233) for perforating a substrate (200). The stem portion (232) stands upward from the centre of a disc-shaped base part (220) and an arrowhead-shaped tip portion (231) is provided integrally at an upper end of the stem portion (232). That is the tip portion (231) is formed to create a cone whose base diameter is greater than the diameter of the stem portion (232). Referring to Fig. 11(a), a base of the stem portion (232) of the pin (230) is frusto-conically shaped with a greater transverse cross-section with respect to the upper parts of the stem portion (232). A bottom face of the arrowhead shaped tip portion (231) facing the base part (220) extends to the stem portion (232), preferably perpendicularly.

[0042] According to the third embodiment, the tack button (210) comprises a base part (220) for detachably mounting the corresponding pin (230) wherein said pin (230) is adapted to project perpendicularly from the base part (220). Advantageously, the base part (220) and the pin (230) are independent of each other and are arranged in such a way that they can be fitted detachably. Referring to Fig. 11(b), the base part (220) is arranged on the one side of the substrate and the button body on the other so as to nip the substrate between base part 220 and button body (140). The third embodiment of the tack button (210) can be used with a different type of button body (140) as shown in Fig. 11(a) and 11(b).

[0043] The button body (140) can be at least partly filled inside with an insert (144) and comprise a cap (145) and a button back (146) although other configurations will be apparent to those skilled in the art. The button back (146) mainly comprises a cylindrical side portion (148) and an annular upper plate-like portion (149) which is laterally extending in the radial direction from the upper end of the side portion. The annular upper plate-like portion (149) has also a step portion (150) therein. The insert (144) can be made of resin or the like, and the insert (144) has a hole (147) formed therein so as to vertically run therethrough. The bottom of the insert (144) is exposed.

[0044] The pin (230) has such a form that, when attached to the base part (220) the arrowhead shape tip portion (231) is raised from the centre of the engaging base portion (233). When the tack button (210) is attached to the substrate (200) with the button body (140), the tack button (210) is arranged on the side of the substrate (200) opposite to the side thereof on which the button body (140) is held in place so as to nip the substrate (200) therebetween and the pin (230) is pushed into the insert (144) in the button body (140). Consequently, the arrowhead shaped tip portion (231) pierces the substrate (200) and is press-fitted into the hole (147) of the insert (144), as shown in Fig. 11b, so that the button (100) can be attached to the substrate (200) by the aid of the anchor effect of the arrowhead shaped tip portion (231) of the pin (230) retained within the insert (144). It will be appreciated that other tip portions (231) can be combined with corresponding inserts (144) to obtain the anchor effect as known in the art.

[0045] The engaging base portion (233) has an annular recess (235) extending perpendicular to the centre axis (Z) of the pin (230) for receiving a radially extending tapered portion (225). When the arrowhead shape tip portion (231) is fully inserted within the hole (147) of the insert (144), the radially and inwardly extending tapered portion (225) engages with the annular recess (235). In possible usages, either the pin (230) may be deformed within the insert (144), or the insert (144) may be deformed around the pin (230) or the pin (230) may simply snap into the insert (144). The base part (220) of the tack button (210) is similarly shaped like the first embodiment of the tack button (10). The base part (210) is generally disc-shaped and has at least one removal hole (221) arranged to receive the removal tool. Referring to Fig. 10b, the base part (220) can have two removal holes (121) spaced apart from each other and two cavities (224) spaced apart from each other wherein an axis between the removal holes (121) is perpendicular to an axis between the cavities (224). These two axes intersect in the centre where the pin (230) extends.

[0046] Referring to Fig. 11(a) and 11(b), the disc-shaped base part (220) has two removal holes (221)

spaced apart from each other for receiving corresponding jaws of the scissor-like removal tool. The base part (220) has a pin receiving portion (223) formed in a middle portion thereof for concentrically receiving the pin (230). The pin receiving portion (223) of the base part (220) joins with at least one, preferably two, adjacent emptied cavities (224) formed in the proximity of the pin receiving portion (23). Referring to Fig. 10b, the oppositely oriented cavities (224) and the pin receiving portion (23, 123, 223) are joined with each other by a narrowed passageway (227). When the user wants to remove the tack button, the corresponding part or parts of the removal tool can be placed within the removal hole(s) (221) and pulled or opened resulting in a widening of the pin receiving portion (223) to allow the pin (30, 130) to pass through. In this process, since the pin receiving portion (223) is widened, the pin receiving portion (223) may not return to its original dimensions.

[0047] According to the present invention, the proposed button (100) mainly comprises a button body (40, 140); and a tack button (10, 110, 210) wherein the tack button (10, 110, 210) has a pin (30, 130, 230) and a base part (20, 120, 220). The pin (30, 130, 230) is formed as a single-piece and the base part (20, 120, 220) is formed as a single piece and the pin (30, 130, 230) and the base part (20, 120, 220) are arranged in such a way that the pin (30, 130, 230) can be fitted detachably to the base part (20, 120, 220). When the two-part tack button (10, 110, 210) is formed, it may also be used for attaching a button (100). The button (100) may comprise two or more parts, namely the button body (40, 140) and the tack button (10, 110, 210) attached to each other with the substrate (200) interposed therebetween. Referring to Figs. 6(b) and 6(c), in the first embodiment, the button body (40) comprises a disk-shaped button body base (41), a convex portion (42) formed in the middle of the button body base (41), and a concave part (43) concentrically formed inside of the convex portion (42). When fastening the button (100) to the substrate, the pin (30, 130) of the tack button (10, 110) is passed through the substrate and is inserted into the concave part (43) of the button body (40). In the next step, the pin (30, 130), by being pressed against the concave part (43), plastically deforms so that the tip portion (31, 131) substantially fills the space inside of the concave part (43), and finally, the pin (30, 130) and concave part (43) engage as shown in Fig 6(b). By doing so, the button (100) is fixed to the substrate (200) so that the button (100) can be attached to the substrate by the aid of the anchor effect of the tip portion (31, 131). The tip end of the tip portion (31, 131) is adapted to be deformed and bulged outwardly when pressed by the button body (40) so that the bulged tip end is engaged with the concave part (43). The pin (30, 130) is preferably hollow (not shown), especially at the tip portion, and generally cylindrical, which requires less force when penetrating the substrate (200). In a possible embodiment, when the concave part (43) is not provided then the tip of the pin (30, 130) can be deformed against an attaching die. It will be appreciated that depending on the skill of the operator and the force used, the deformation of the pin will vary.

[0048] The button body (40, 140) can be made of aluminium, iron, stainless steel alloy, copper alloy including brass or other kinds of metals or plastic resin by appropriate processing such as press working, casting, or molding. The pin (30, 130, 230) and the base part (20, 120, 220) of the tack button (10, 110, 210) may be made of aluminium, iron, stainless steel alloy, copper alloy including brass or other kind of metals or plastic resin by appropriate processing such as press working casting or molding.

[0049] In the art, it is possible that the force exerted on a tack button during removal will inflict damage on the button and/or the substrate and render it no longer usable. Accordingly, a button may not be detached despite the user applying excessive force. The proposed tack button (10, 110, 210) enables a facilitated releasable attachment. Advantageously, the base part (20, 120, 220) and the pin (30, 130, 230) of the tack button (10, 110, 210) are formed as separate parts and can be detached from each other whenever needed (e.g., for recycling). Another benefit of the invention is that the tack button (10, 110, 210) according to the present invention is partly replaceable or repairable because the parts of the tack button (10, 110, 210) are separate and can be replaced with the desired ones. This also allows repairs to the item to which the tack button (10, 110, 210) is attached without destroying the item in the process of removing a button (100).

[0050] Upon reading the present description, a person skilled in the art can easily select suitable measures (e.g., matching geometries, flexible portions) to achieve respective functions of any of the features (e.g., pin, and base part) related to the tack button (10, 110, 210). The base part (20, 120, 220) is arranged to partially flex so as to allow elastic deflection when attaching or detaching the pin (30, 130, 230) from the base part (20, 120, 220). Additionally, the skilled person in the art can select any shapes which will allow the base part (20, 120, 220) to comprise logos and designs or for such logos and designs to be engraved, embossed or otherwise incorporated into the top surface of the base part (20, 120, 220). Such shapes may not be generally disc-shaped.

[0051] The present invention also proposes a method for producing a two-part tack button (10, 110, 210) for a button (100). The method comprises the steps of providing a base part (20, 120, 220); providing a separate pin (30, 130, 230) having an engaging base portion (33, 133, 233) with an extending stem portion (32, 132, 232) and a tapering tip portion (31, 131, 231) distal to the engaging base portion (33, 133, 233) for perforating a substrate (200); and fitting the pin (30, 130, 230) in the base part (20, 120, 220) to project perpendicularly from a top face of the base part (20, 120, 220).

[0052] The button (100) can be also served as a kit. Firstly, the pin (30, 130, 230) is placed within the base

part (20, 120, 220) and then the base part (20, 120, 220) is squeezed and fitted with the pin (30, 130, 230). Secondly, the formed two-part tack button (10, 110, 210) is provided to a user with the corresponding button body (40, 140), which together forms the button (100). The proposed tack button (10, 110, 210) may also be arranged to function as a rivet.

[0053] In a possible embodiment, the engaging base portion (33, 133, 233) of the pin (30, 130, 230) may also be deformable and crushed so that the pin (30, 130, 230) is able to pass through the base part (20, 120, 220).

[0054] The present invention also proposes a button (100) comprising a button body (40, 140); and a tack button (10, 110, 210) having a pin (30, 130, 230) and a base part (20, 120, 220) for detachably mounting the pin (30, 130, 230), said pin (30, 130, 230) being adapted to project perpendicularly from the base part (20, 120, 220) wherein the base part (20, 120, 220) and the pin (30, 130, 230) are independent of each other and are arranged in such a way that they can be fitted detachably; and wherein the tack button (10, 110, 210) is fixed to the button body (40, 140).

List of Reference Signs:

[0055]

10, 110, 210	Tack button
20, 120, 220	Base part
	21, 121, 221 Removal hole
	22 Groove
	23, 123, 223 Pin receiving portion
	24, 124, 224 Cavity
	25, 125 Tapered portion
	126 Receiving section
	27, 127 Passageway
	28 Engagement gap
30, 130, 230	Pin
	31, 131, 231 Tip portion
	32, 132, 232 Stem portion
	33, 133, 233 Engaging base portion
	34 Shoulder
	35, 135, 235 Annular recess
	136 Inner portion
40, 140	Button body
	41 Button body base
	42 Convex portion
	43 Concave part
	144 Insert
	145 Cap
	146 Button back
	147 Hole
	148 Cylindrical side portion
	149 Annular upper plate-like portion
	150 Step portion
100	Button
200	Substrate
Z	Centre axis
X	Horizontal axis of the base part
Y	Vertical axis of the base part W1 Width

Claims

1. A tack button (10, 110, 210) for attaching a substrate (200), the tack button (10, 110, 210) comprising:

   - a pin (30, 130, 230);
   - a base part (20, 120, 220) for detachably mounting the pin (30, 130, 230);
   - said pin (30, 130, 230) being adapted to project perpendicularly from the base part (20, 120, 220) wherein the base part (20, 120, 220) and the pin (30, 130, 230) are independent of each other,

   the tack button being **characterised in that** the base part (20, 120, 220) has at least one removal hole (21, 121, 221) arranged to receive a part of a removal tool.

2. The tack button (10, 110, 210) according to claim 1, wherein the pin (30, 130, 230) has an engaging base portion (33, 133, 233), a stem portion (32, 132, 232) extending from the engaging base portion (33, 133, 233), and a tapering tip portion (31, 131, 231) distal to the engaging base portion (33, 133, 233) for perforating the substrate (200).

3. The tack button (10, 110, 210) according to claim 1 or 2, wherein the base part (20, 120, 220) has a pin receiving portion (23, 123, 223) formed in a middle portion thereof for concentrically receiving the pin (30, 130, 230).

4. The tack button (10, 110) according to any of claims 1 to 3, wherein the base part (20, 120, 220) has at least two removal holes (21, 121, 221) which are spaced apart from each other such that when the removal holes (21, 121, 221) are extended further away from each other by a removal tool, the pin receiving portion (23, 123, 223) elastically widens and allows the pin (30, 130, 230) to pass therefrom.

5. The tack button (10, 110, 210) according to any of claims 1 to 4, wherein the base part (20, 120, 220) is arranged to partially flex so as to allow elastic deflection when attaching or detaching the pin (30, 130, 230) from the base part (20, 120, 220).

6. The tack button (10, 110, 210) according to any of claims 1 to 5, wherein the base part (20, 120, 220) has at least one emptied cavity (24, 124, 224) formed in the proximity of a pin receiving portion (23, 123, 223) of the base part (20, 120, 220).

7. The tack button (10, 110, 210) according to claim 6, wherein at least one cavity (24, 124, 224) and the pin receiving portion (23, 123, 223) are joined with each other by a narrowed passageway (27, 127, 227).

8. The tack button (10, 210) according to claim 7, wherein the base part (20, 220) has two removal holes (21, 121) spaced apart from each other and has two cavities (24, 224) spaced apart from each other wherein an axis between the removal holes (21, 121) is perpendicular to an axis between the cavities (24, 224).

9. The tack button (10, 210) according to any of claims 1 to 8, wherein a pin receiving portion (23, 223) of the base part (20, 220) has an inwardly and radially extending tapered portion (25, 225) arranged to substantially coincide with an engaging base portion (33, 233) of the pin (30, 130).

10. The tack button (10, 210) according to claim 9, wherein the engaging base portion (33, 233) has an annular recess (35, 235) shaped and dimensioned such that when the pin (30, 230) is inserted in a pin receiving portion (23, 223), the pin receiving portion (23, 223) and the annular recess (35, 235) of the engaging base portion (33, 233) engage each other.

11. The tack button (10, 210) according to any of claims 1 to 10, wherein a tapering tip portion (31, 131) of the pin (30, 130, 230) is deformed or bulged.

12. A button (100) comprising:

    a button body (40, 140); and
    a tack button (10, 110, 210) according to any of claims 1 to 11 wherein the tack button (10, 110, 210) is fixed to the button body (40, 140).

13. The button (100) according to claim 12, wherein the button (100) is arranged such that when the tack button (10, 110) is pressed against the button body (40), a tip portion (31, 131) of the pin (30, 130) is deformed or bulged outwardly for engaging the button body (40).

Patentansprüche

1. Nagelstiftknopf (10,110, 210) zum Anbringen eines Substrats (200), wobei der Nagelstiftknopf (10, 110, 210) Folgendes umfasst:

    - einen Stift (30, 130, 230);
    - ein Basisteil (20, 120, 220) zum lösbaren Befestigen des Stifts (30, 130), 230);
    - wobei der Stift (30, 130, 230) dazu ausgebildet ist, senkrecht von dem Basisteil (20, 120, 220) abzustehen, wobei das Basisteil (20, 120, 220) und der Stift (30, 130, 230) unabhängig voneinander sind,

    wobei der Nagelstiftkopf **dadurch gekennzeichnet ist, dass** das Basisteil (20, 120, 220) mindestens ein Entfernungsloch (21, 121, 221) aufweist, das zum Aufnehmen eines Teils eines Entfernungswerkzeugs eingerichtet ist.

2. Nagelstiftknopf (10, 110, 210) nach Anspruch 1, wobei der Stift (30, 130, 230) einen eingreifenden Basisabschnitt (33, 133, 233), einen sich von dem eingreifenden Basisabschnitt (33, 133, 233) erstreckenden Schaftabschnitt (32, 132, 232) und einen distal zu dem eingreifenden Basisabschnitt (33, 133, 233) gelegenen sich verjüngenden Spitzenabschnitt (31, 131, 231) zum Durchbohren des Substrats (200) aufweist.

3. Nagelstiftknopf (10, 110, 210) nach Anspruch 1 oder 2, wobei das Basisteil (20, 120, 220) einen in einem Mittelabschnitt davon ausgebildeten Stiftaufnahmeabschnitt (23, 123, 223) zum konzentrischen Aufnehmen des Stifts (30, 130, 230) aufweist.

4. Nagelstiftknopf (10, 110) nach einem der Ansprüche 1 bis 3, wobei das Basisteil (20, 120, 220) mindestens zwei Entfernungslöcher (21, 121, 221) aufweist, die derart voneinander beabstandet sind, dass sich der Stiftaufnahmeabschnitt (23, 123, 223), wenn die Entfernungslöcher (21, 121, 221) durch ein Entfernungswerkzeug weiter voneinander weg auseinandergezogen werden, elastisch verbreitert und das Passieren des Stifts (30, 130, 230) von dort aus ermöglicht.

5. Nagelstiftknopf (10, 110, 210) nach einem der Ansprüche 1 bis 4, wobei das Basisteil (20, 120, 220) so eingerichtet ist, dass es sich teilweise biegt, um eine elastische Verbiegung zu ermöglichen, wenn der Stift (30, 130, 230) an das Basisteil (20, 120, 220) angebracht oder von diesem gelöst wird.

6. Nagelstiftknopf (10, 110, 210) nach einem der Ansprüche 1 bis 5, wobei das Basisteil (20, 120, 220) mindestens eine geräumte Vertiefung (24, 124, 224) aufweist, die in der Nähe eines Stiftaufnahmeabschnitts (23, 123, 223) des Basisteils (20, 120, 220) ausgebildet ist.

7. Nagelstiftknopf (10, 110, 210) nach Anspruch 6, wobei mindestens eine Vertiefung (24, 124, 224) und der Stiftaufnahmeabschnitt (23, 123, 223) durch einen verengten Durchgang (27, 127, 227) miteinander verbunden sind.

8. Nagelstiftknopf (10, 210) nach Anspruch 7, wobei das Basisteil (20, 220) zwei Entfernungslöcher (21, 121) aufweist, die voneinander beabstandet sind, und zwei Vertiefungen (24, 224) aufweist, die voneinander beabstandet sind, wobei eine Achse zwischen den Entfernungslöchern (21, 121) senkrecht zu einer Achse zwischen den Vertiefungen (24, 224) ist.

9. Nagelstiftknopf (10, 210) nach einem der Ansprüche 1 bis 8, wobei ein Stiftaufnahmeabschnitt (23, 223) des Basisteils (20, 220) einen sich nach innen und radial erstreckenden verjüngten Abschnitt (25, 225) aufweist, der eingerichtet ist, um im Wesentlichen mit einem eingreifenden Basisabschnitt (33, 233) des Stifts (30, 130) übereinzustimmen.

10. Nagelstiftknopf (10, 210) nach Anspruch 9, wobei der eingreifende Basisabschnitt (33, 233) eine ringförmige Aussparung (35, 235) aufweist, die derart geformt und dimensioniert ist, dass der Stiftaufnahmeabschnitt (23, 223) und die ringförmige Aussparung (35, 235) des eingreifenden Basisabschnitts (33, 233) ineinander eingreifen, wenn der Stift (30, 230) in einen Stiftaufnahmeabschnitt (23, 223) eingeführt ist.

11. Nagelstiftknopf (10, 210) nach einem der Ansprüche 1 bis 10, wobei ein sich verjüngender Spitzenabschnitt (31, 131) des Stifts (30, 130, 230) verformt oder gewölbt wird.

12. Knopf (100), umfassend:

einen Knopfkörper (40, 140); und
einen Nagelstiftknopf (10, 110, 210) nach einem der Ansprüche 1 bis 11, wobei der Nagestiftknopf (10, 110, 210) an dem Knopfkörper (40, 140) befestigt wird.

13. Knopf (100) nach Anspruch 12, wobei der Knopf (100) so eingerichtet ist, dass ein Spitzenabschnitt (31, 131) des Stifts (30, 130), wenn der Nagelstiftknopf (10, 110) gegen den Knopfkörper (40) gedrückt wird, zum Eingreifen in den Knopfkörper (40) nach außen verformt oder gewölbt wird.

Revendications

1. Un bouton d'accrochage (10, 110, 210) pour fixer un substrat (200), le bouton d'accrochage (10, 110, 210) comprenant :

- une broche (30, 130, 230) ;
- une partie de base (20, 120, 220) pour monter de manière détachable la broche (30, 130, 230) ;
- ladite broche (30, 130, 230) étant adaptée pour faire saillie perpendiculairement de la partie de base (20, 120, 220), dans laquelle la partie de base (20, 120, 220) et la broche (30, 130, 230) sont indépendantes l'une de l'autre,

le bouton d'accrochage étant **caractérisé en ce que** la partie de base (20, 120, 220) présente au moins un trou d'extraction (21, 121, 221) agencé pour recevoir une partie d'un outil d'extraction.

2. Un bouton d'accrochage (10, 110, 210) selon la revendication 1, dans lequel la broche (30, 130, 230) comporte une partie de base engageante (33, 133, 233), une partie de tige (32, 132, 232) s'étendant de la partie de base engageante (33, 133, 233), et une partie terminale effilée (31, 131, 231) distale par rapport à la partie de base engageante (33, 133, 233) pour perforer le substrat (200).

3. Un bouton d'accrochage (10, 110, 210) selon la revendication 1 ou 2, dans lequel la partie de base (20, 120, 220) présente une partie de réception de la broche (23, 123, 223) formée dans une partie médiane de celle-ci pour recevoir concentriquement la broche (30, 130, 230).

4. Un bouton d'accrochage (10, 110) selon l'une quelconque des revendications 1 à 3, dans lequel la partie de base (20, 120, 220) comporte au moins deux trous d'extraction (21, 121, 221) qui sont espacés l'un de l'autre de telle sorte que lorsque les trous d'extraction (21, 121, 221) sont étendus davantage l'un de l'autre par un outil d'extraction, la partie de réception de la broche (23, 123, 223) s'élargit élastiquement et permet à la broche (30, 130 , 230) de passer au travers.

5. Un bouton d'accrochage (10, 110, 210) selon l'une quelconque des revendications 1 à 4, dans lequel la partie de base (20, 120, 220) est agencée pour fléchir partiellement de manière à permettre une déflection élastique lors de la fixation ou du détachement de la broche (30, 130, 230) de la partie de base (20, 120, 220).

6. Un bouton d'accrochage (10, 110, 210) selon l'une quelconque des revendications 1 à 5, dans lequel la partie de base (20, 120, 220) présente au moins une cavité vidée (24, 124, 224) formée à proximité d'une partie de réception de la broche (23, 123, 223) de la partie de base (20, 120, 220).

7. Un bouton d'accrochage (10, 110, 210) selon la revendication 6, dans lequel au moins une cavité (24, 124, 224) et la partie de réception de la broche (23, 123, 223) sont reliées entre elles par un passage rétréci (27, 127, 227).

8. Un bouton d'accrochage (10, 210) selon la revendication 7, dans lequel la partie de base (20, 220) comporte deux trous d'extraction (21, 121) espacés de façon distincte l'un de l'autre et comporte deux cavités (24, 224) espacées l'une de l'autre dans lesquelles, un axe entre les trous d'extraction (21, 121) est perpendiculaire à un axe entre les cavités (24, 224).

9. Un bouton d'accrochage (10, 210) selon l'une quelconque des revendications 1 à 8, dans lequel une partie de réception de la broche (23, 223) de la partie de base (20, 220) comporte une partie effilée (25, 225) s'étendant vers l'intérieur et radialement, agencée pour coïncider sensiblement avec une partie de base engageante (33, 233) de la broche (30, 130).

10. Un bouton d'accrochage (10, 210) selon la revendication 9, dans lequel la partie de base engageante (33, 233) comporte un évidement annulaire (35, 235) formé et dimensionné de telle sorte que lorsque la broche (30, 230) est insérée dans une partie de réception de la broche (23, 223), la partie de réception de la broche (23, 223) et l'évidement annulaire (35, 235) de la partie de base engageante (33, 233) s'engagent l'un dans l'autre.

11. Un bouton d'accrochage (10, 210) selon l'une quelconque des revendications 1 à 10, dans lequel une partie terminale effilée (31, 131) de la broche (30, 130, 230) est déformée ou bombée.

12. Un bouton (100) comprenant :

un corps de bouton (40, 140) ; et
un bouton d'accrochage (10, 110, 210) selon l'une quelconque des revendications 1 à 11, dans lequel le bouton d'accrochage (10, 110, 210) est fixé au corps de bouton (40, 140).

13. Bouton (100) selon la revendication 12, dans lequel le bouton (100) est agencé de telle sorte que lorsque le bouton d'accrochage (10, 110) est pressé contre le corps de bouton (40), une partie de pointe (31, 131) de la broche (30, 130) est déformée ou bombée vers l'extérieur pour s'engager dans le corps du bouton (40).

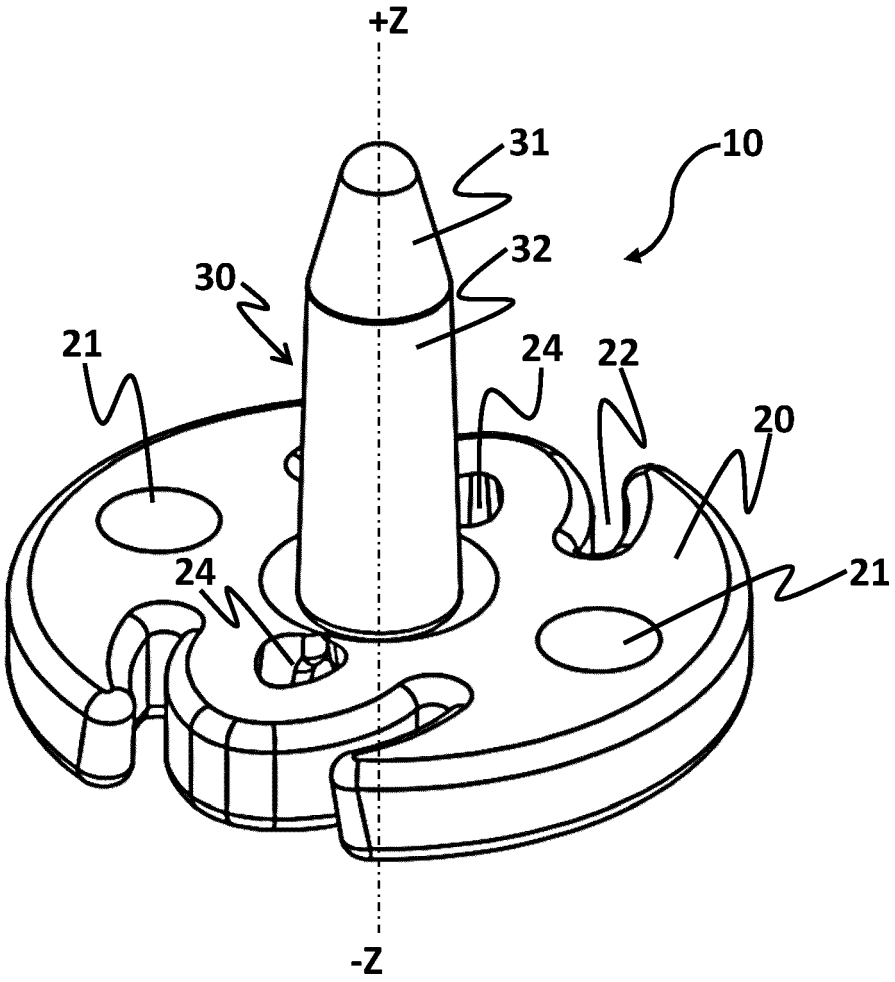

FIG. 1(a)

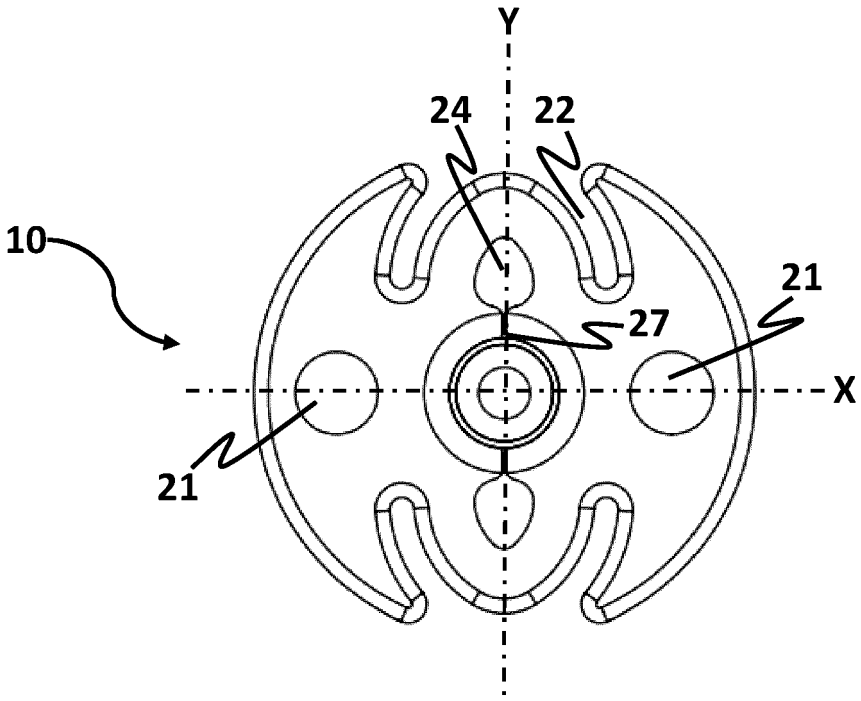

FIG. 1(b)

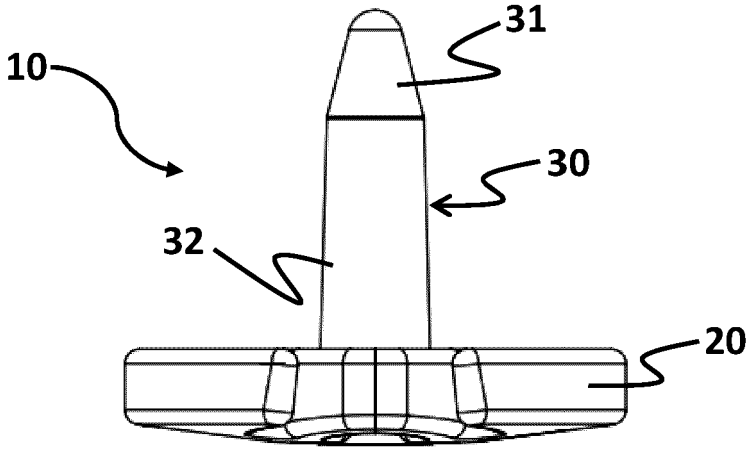

FIG. 1(c)

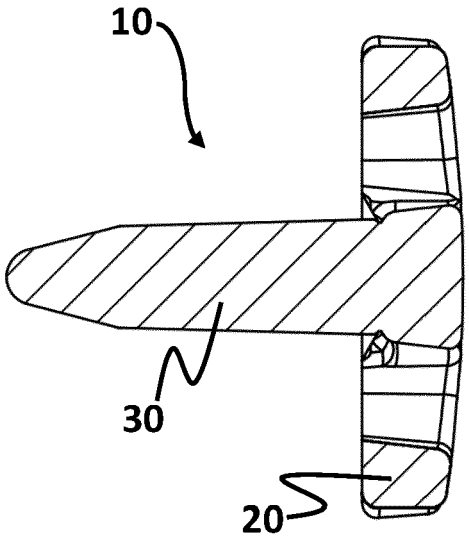

FIG. 2(a)

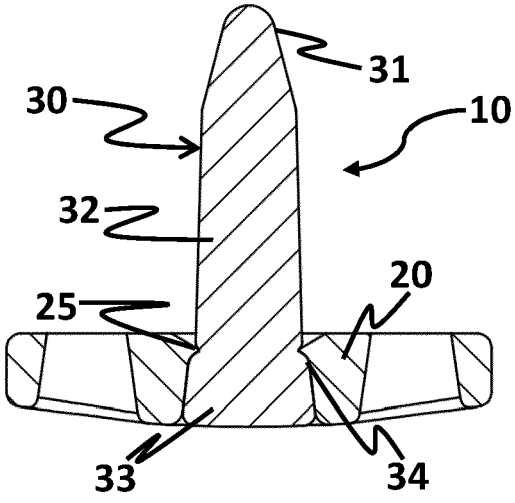

FIG. 2(b)

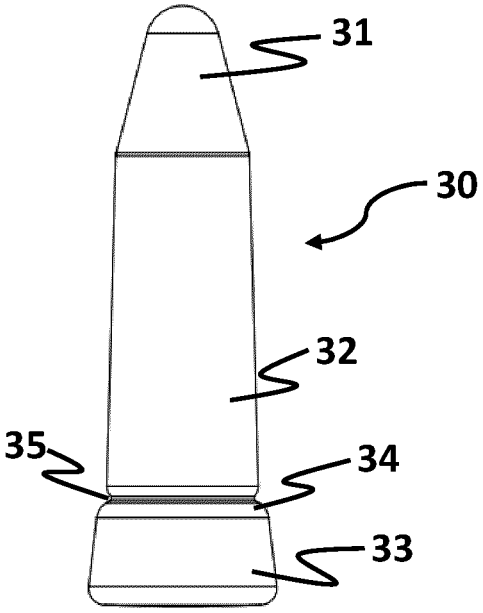

FIG. 3(a)

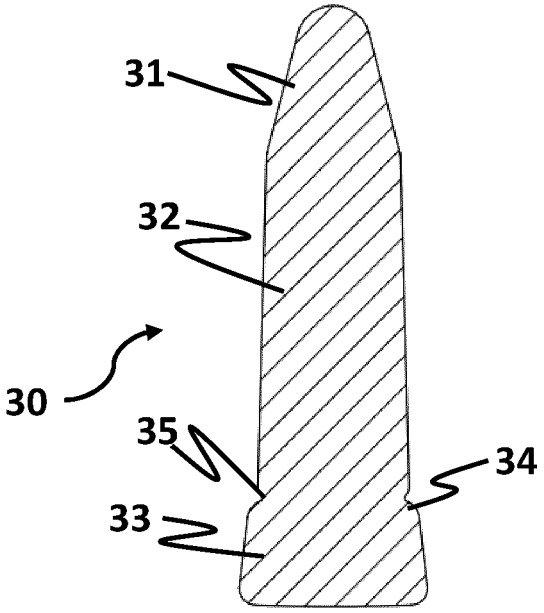

FIG. 3(b)

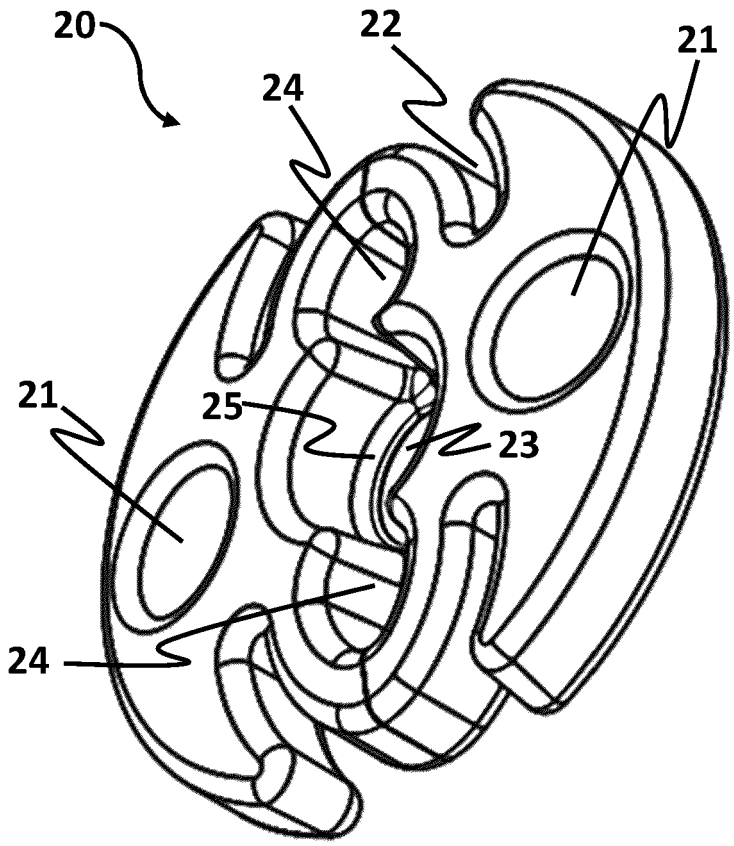

FIG. 4(a)

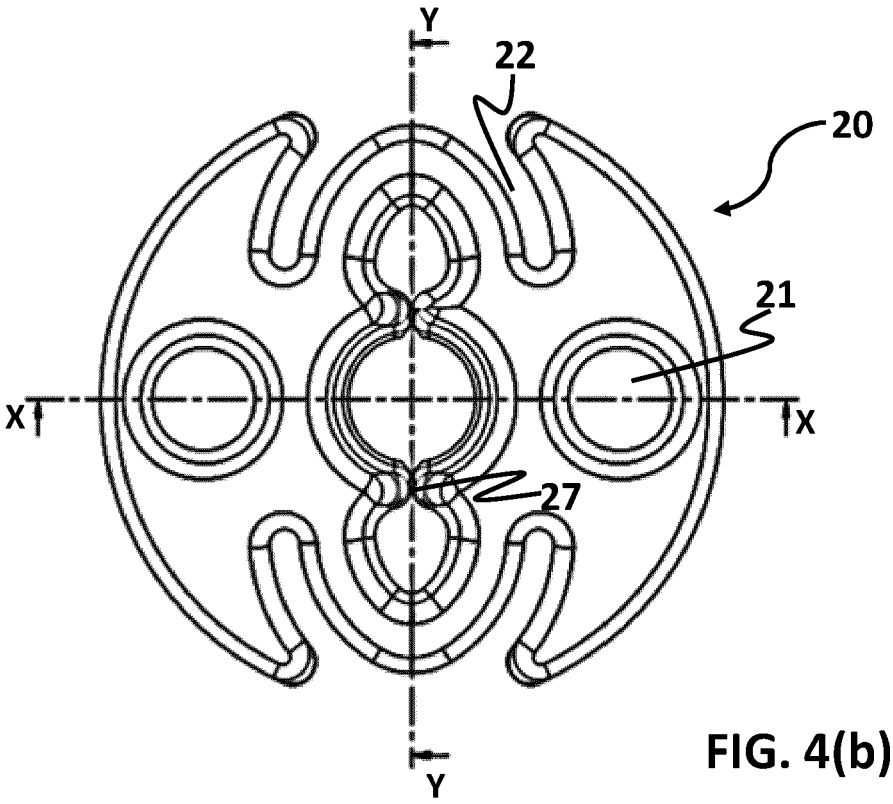

FIG. 4(b)

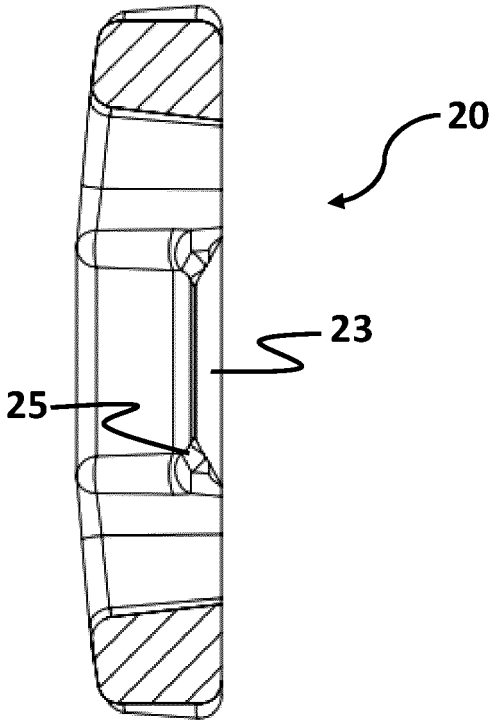

FIG.4(c)

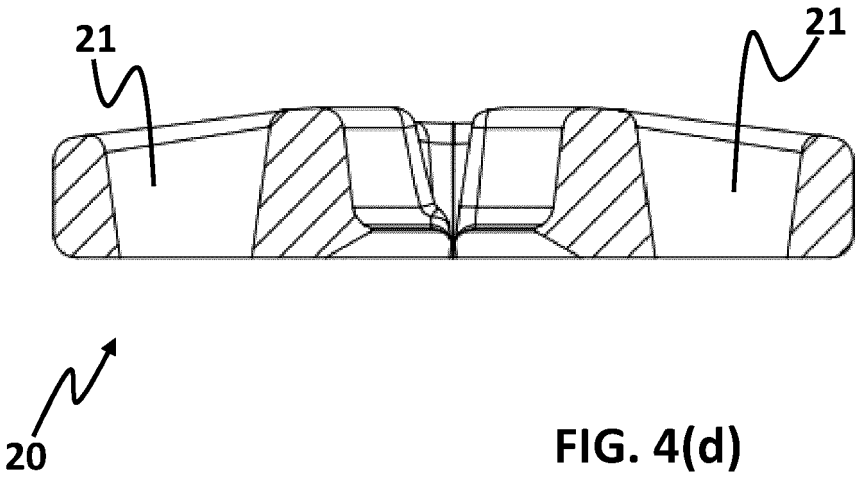

FIG. 4(d)

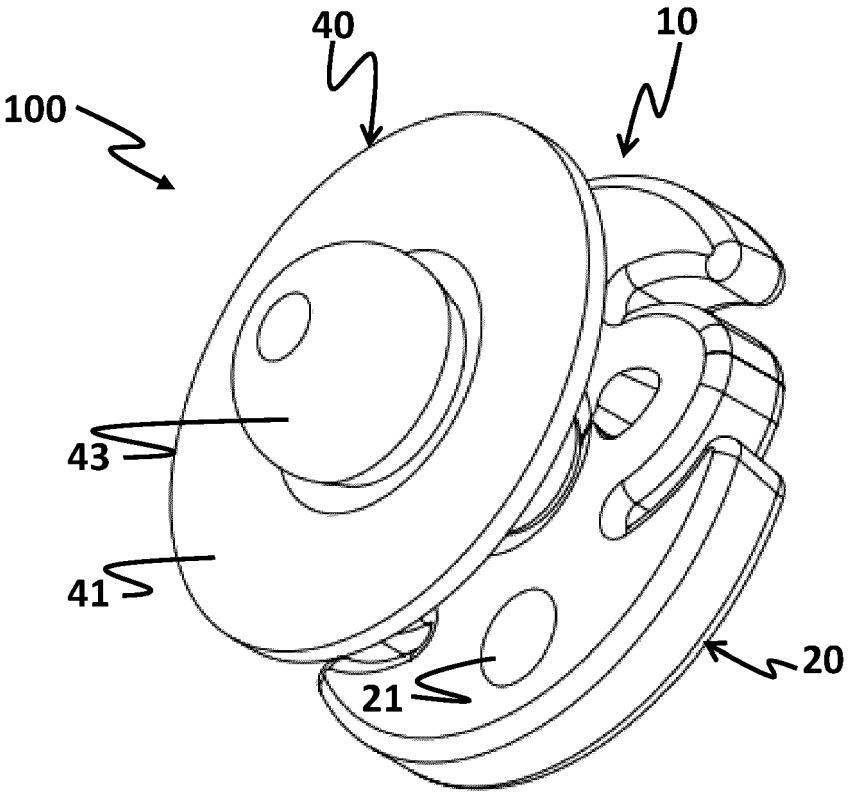

FIG. 5(a)

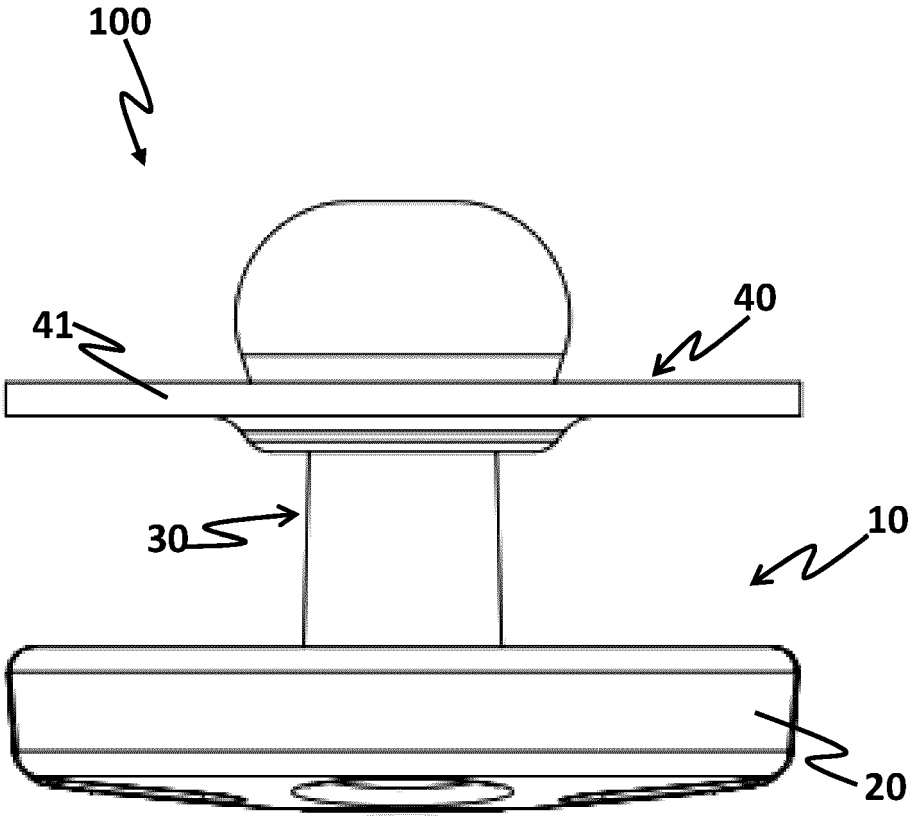

FIG. 5(b)

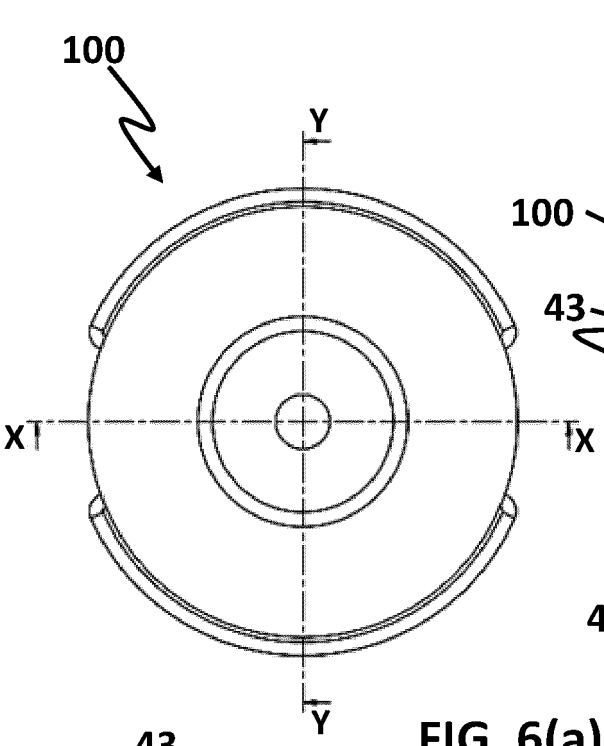

FIG. 6(a)

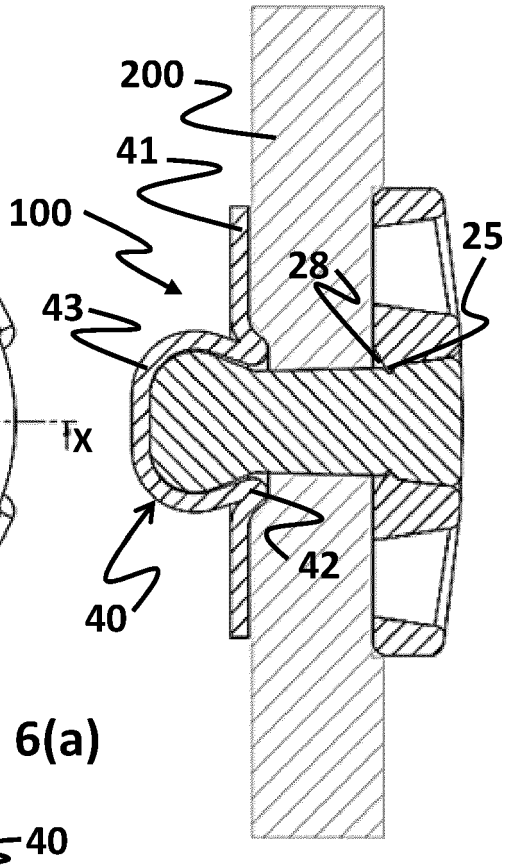

FIG. 6(b)

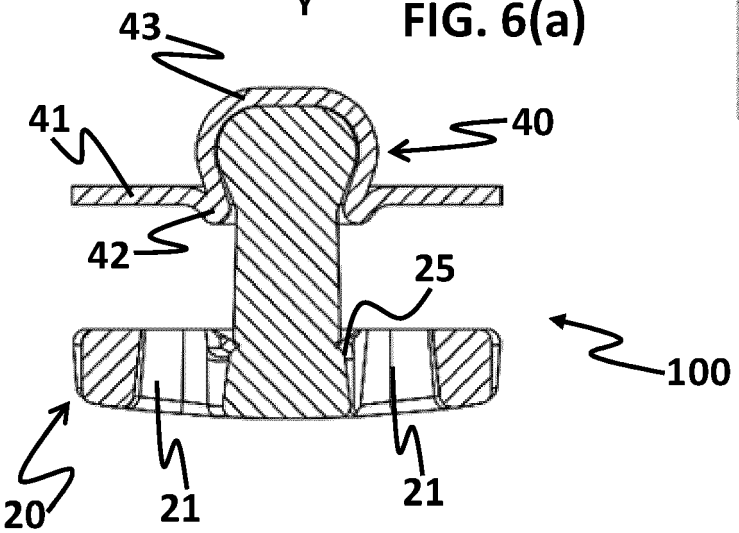

FIG. 6(c)

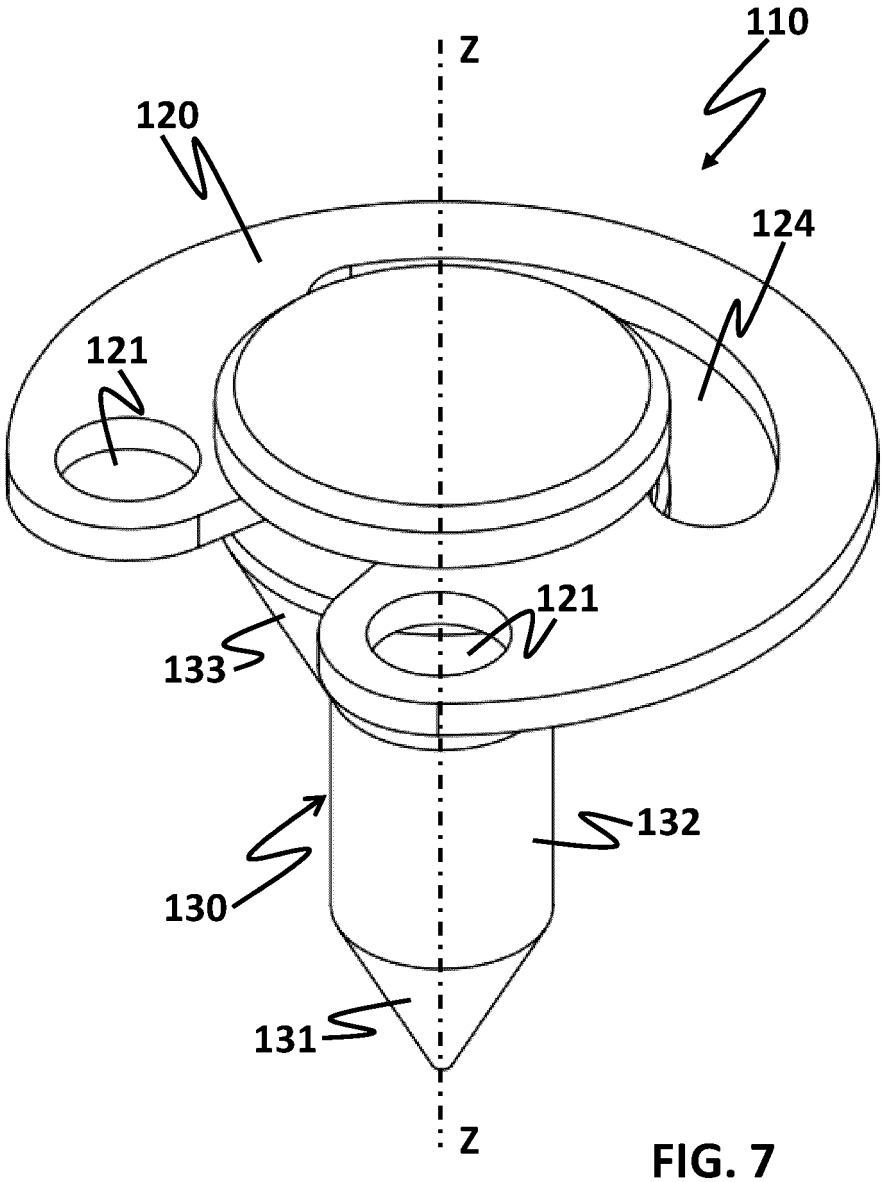

FIG. 7

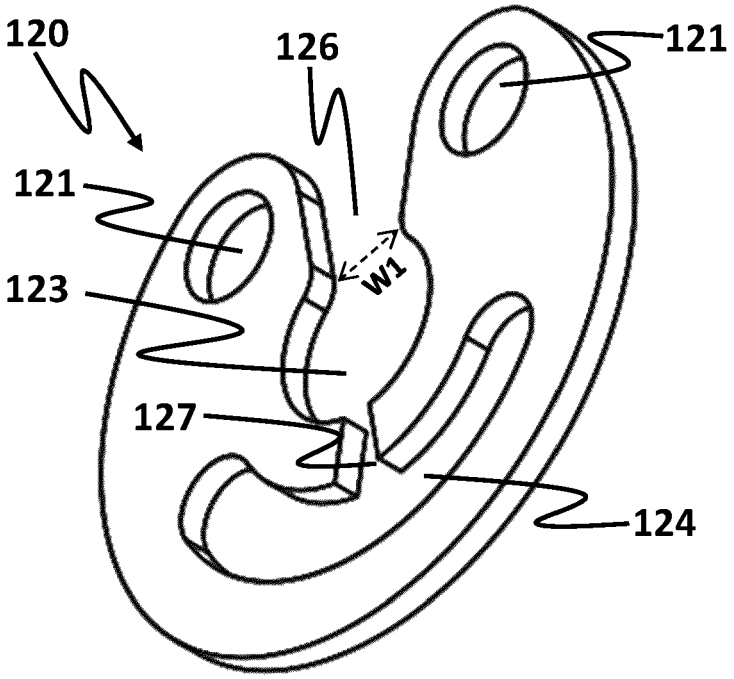

FIG. 8(a)

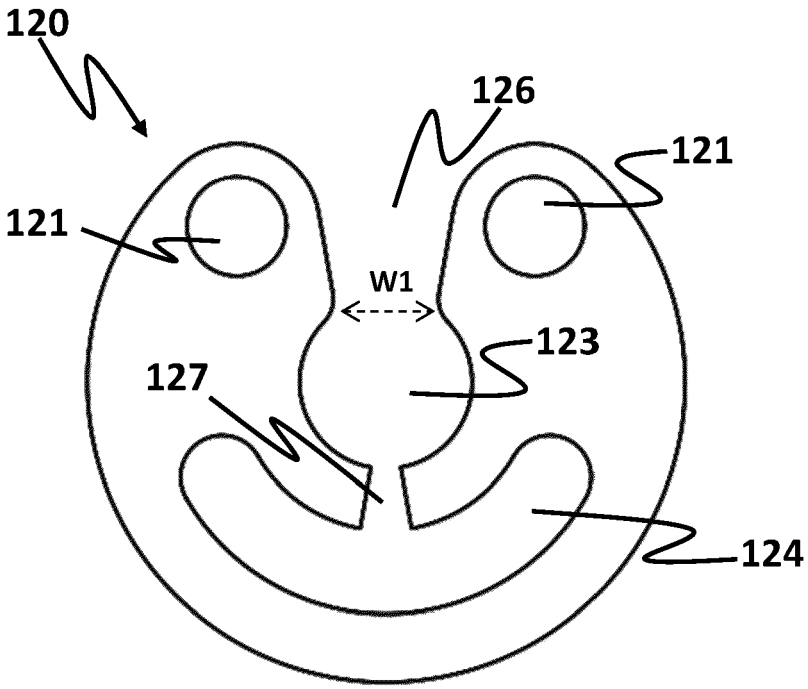

FIG. 8(b)

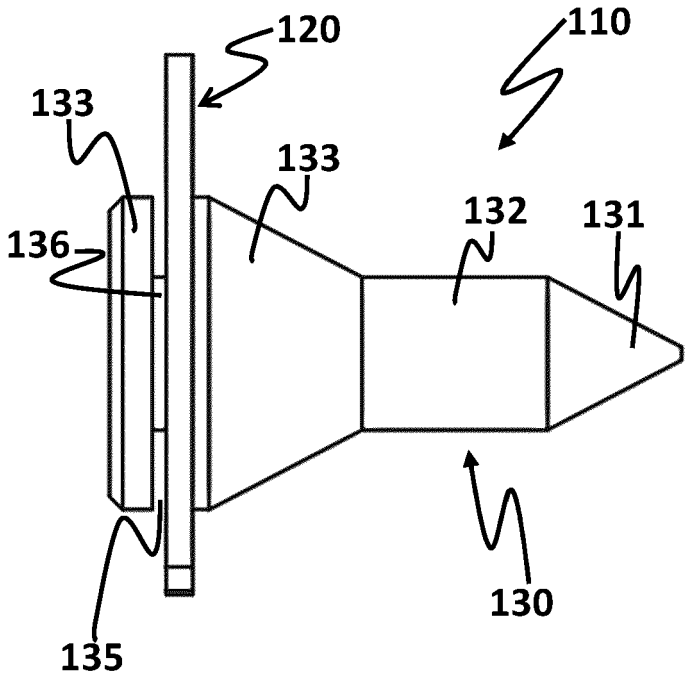

FIG. 9(a)

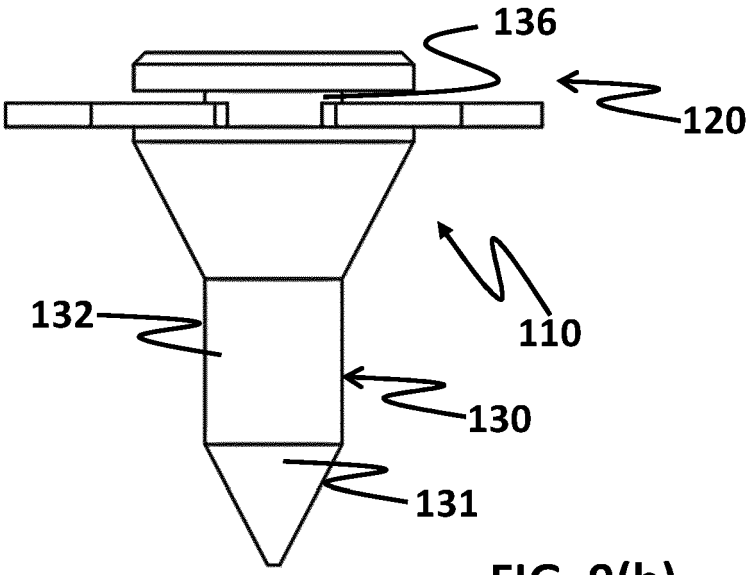

FIG. 9(b)

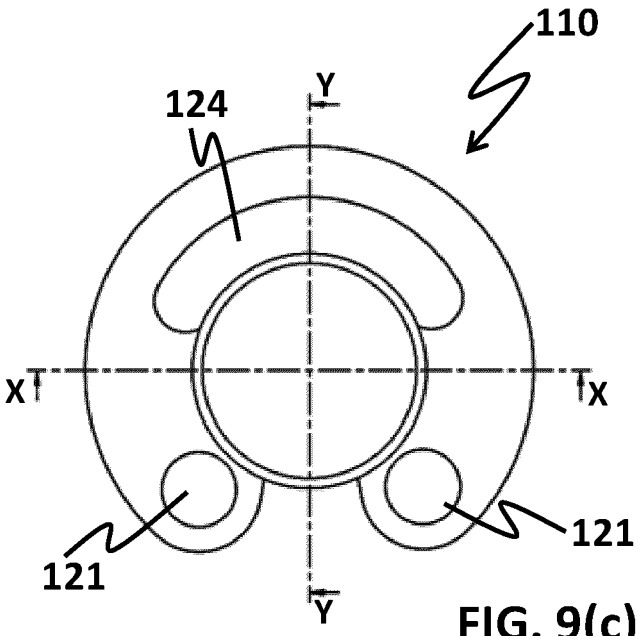

FIG. 9(c)

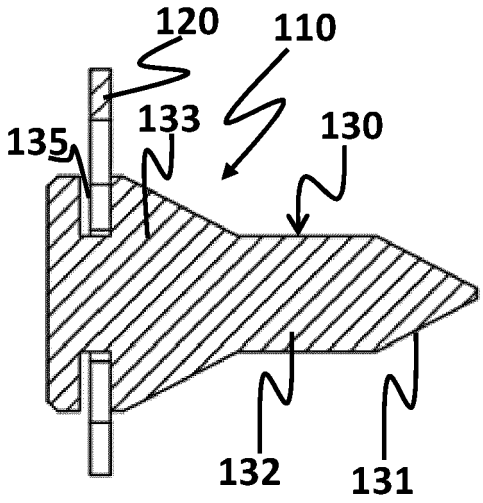

FIG. 9(d)

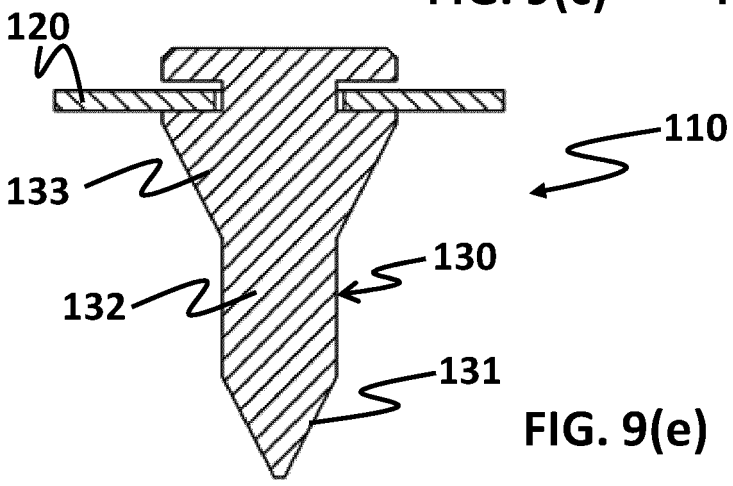

FIG. 9(e)

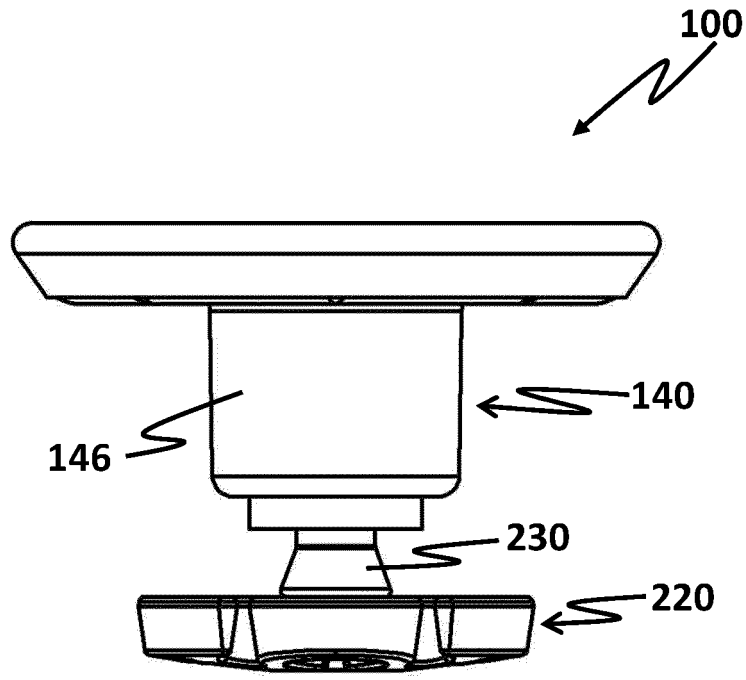

FIG. 10(a)

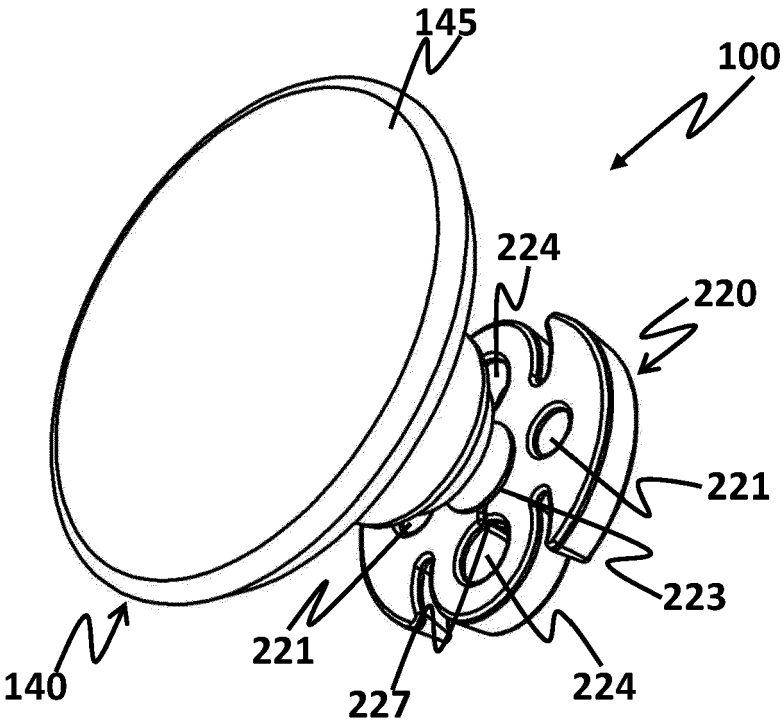

FIG. 10(b)

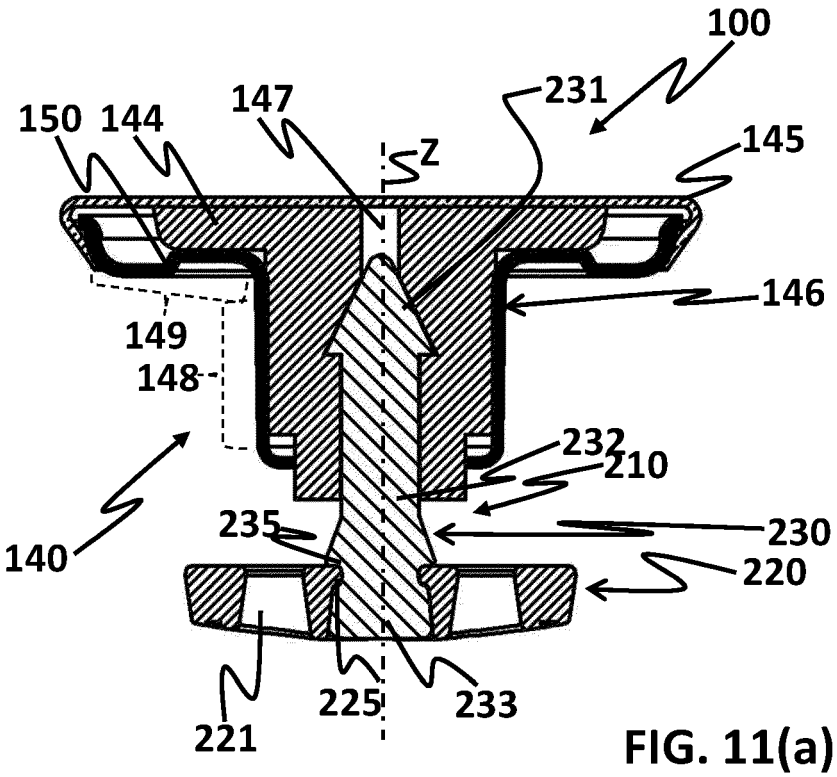

FIG. 11(a)

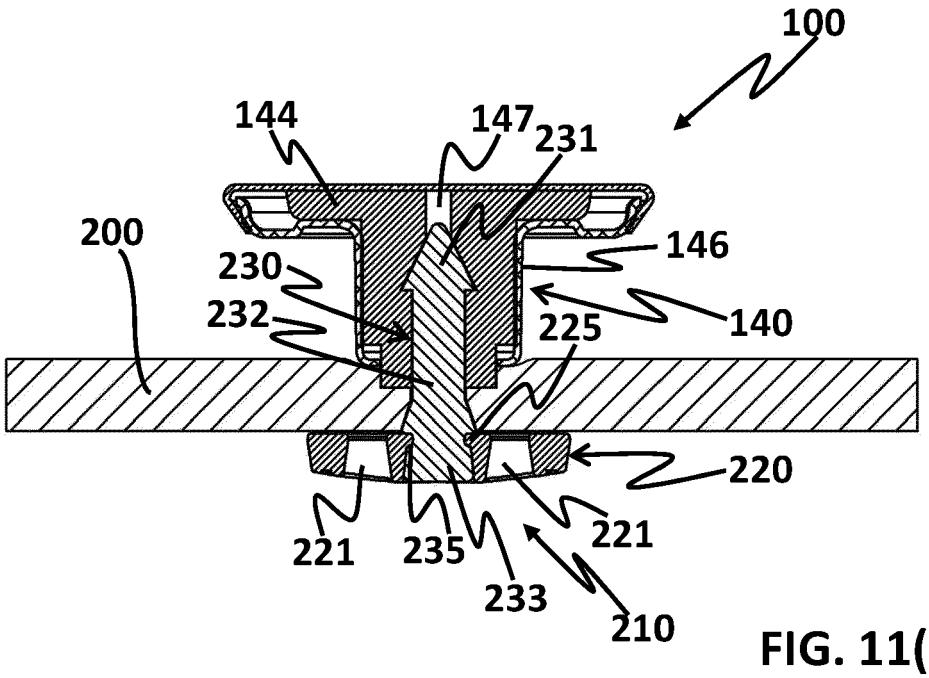

FIG. 11(b)

REFERENCES CITED IN THE DESCRIPTION

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- EP 0733315 A1 **[0004]**
- EP 2361522 A1 **[0005]**
- US 2018184766 A1 **[0006]**
- KR 102097901 B1 **[0006]**