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Description

The present invention relates to an anchoring device for anchoring a building layer to an attachment surface of a substrate such as a wall, which device comprises a mounting bracket for attachment to the substrate, a connecting device extending outwardly from the mounting bracket and for extending through the building layer, a fastening device attached to the opposite end of the connecting device and a fastening element co-operating with the fastening device for securing the building layer to the attachment surface via the connecting element.

Previously disclosed by, inter alia, SE-B-403 310 SE-B-423 419 is an arrangement of the above indicated kind, which has the ability to alternate mechanically between a free and a locked position in order, when in the locked position, to permit a layer of thermal insulation to be inserted over the element, and in addition to support a surface layer, such as reinforced rendering. When in the free position, the function is to take up movements due, for example, to varying climatic stresses.

Familiar solutions which are suitable, inter alia, to enable insulation to be inserted in a pre-installed position are nevertheless complicated, subject to rattling, and unmanageable with regard both to their construction and their function. Furthermore, familiar ties are not arranged in such a way that the intended building layers are supported correctly with regard to, inter alia, absorption of the load.

The SE, B, 451.478 discloses an anchoring device for anchoring a building layer to an attachment surface of a substrate. Said device comprises a mounting bracket for attachment to the substrate, a connecting device extending from the mounting bracket and for extending through the building layer, a fastening device attached to the opposite end of the connecting device. A fastening element is co-operating with the fastening device for securing the building layer to the attachment surface via the connecting element.

The connecting device at said known anchoring device consists of two rods made of metal and which are parallel to each other extending at right angles to the wall.

The known device does not consist of a flexible wire made of metallic material and which exhibits flexibility and which extends at an initial angle in a downward direction from the intended mounting bracket for the fastening, so that angular deformation is achieved forcibly in the flexible wire. The idea with said flexible metallic wire is that it results in a smaller flexural rigidity in the total construction, yet retaining the tensile strength, and that the outer end of the wire describes a downward movement along the circumference of a circle and moves

inwards towards the attachment plane at the same time.

If a wire extends at right angles to a wall, the free end of the wire will swing down more when it is forced from the surface layer than it will swing down when the wire from the beginning extends downwards at an initial angle.

With a flexible wire it is possible to take up high forces even with small diameters compared with rods and similar connecting elements.

The SE, B, 455.951 also discloses an anchoring device similar to the device discussed above. A rod made of metallic material is rigidly connected to an attachment. When the force is too high, the connection will break and the rod will swing downwards from a right angle from a wall to which it is fastened. The drawback with this device has already been discussed above.

The principal object of the present invention is thus, in the first place, to make available an arrangement which, inter alia, solves said problem simply and effectively.

Said purpose is achieved by means of an arrangement in accordance with the present invention, which is characterized essentially in that the connecting device is in the form of a flexible cable made of metallic material which extends downwardly from the mounting bracket at an initial inclination angle relative to the normal extending from the vertical plane of the mounting bracket, so that angular deformation is achieved forcibly in the flexible cable.

Examples of the intended arrangement for a fastening element in accordance with the present invention are described below as a number of preferred illustrative embodiments, in conjunction with which reference is made at the same time to the drawings, in which:

Fig. 1 shows schematically and in perspective insulation and external surface layers fastened to a wall;

Fig. 2 shows a schematic section through a wall and insulation adapted for the push-on assembly of insulation to fastening elements;

Fig. 2A shows a schematic section through insulation fastened to a wall;

Fig. 2B shows a schematic section through insulation and a surface coating fastened to a wall;

Fig. 3 shows a Schematic section through a wall and insulation adapted for the push-through assembly of fastening elements;

Fig. 4 shows an arrangement for a fastening element before the attachment of same to the intended wall and insulation;

Fig. 5 shows a locking device;

Fig. 6 shows a view of a fastening device;

Fig. 7 shows a first illustrative embodiment of an arrangement for a fastening element arranged in

accordance with the present invention;

Fig. 7A shows the arrangement in perspective view from the underside;

Fig. 7B shows a section along a similar arrangement for a fastening element;

Fig. 7C shows a longitudinal section of another similar arrangement for a fastening element;

Figs. 8-8A show variants of a second illustrative embodiment of an arrangement for a fastening element in longitudinal section;

Figs. 9-9A show variants of a third illustrative embodiment of an arrangement for a fastening element in longitudinal section;

Fig. 10 shows a fourth illustrative embodiment of an arrangement for a fastening element in longitudinal section;

Fig. 11 shows a fifth illustrative embodiment of an arrangement for a fastening element in longitudinal section;

Fig. 11A shows an anchoring to an arrangement for a fastening element;

Fig. 12 shows in longitudinal section an installation tool for the fastening of an arrangement for a fastening element of a particular kind, with cross-sections through the tool illustrated above; and

Fig. 13 similarly shows a longitudinal section of an installation tool for the fastening of an arrangement for a fastening element of another kind, with such an arrangement for a fastening element introduced into the tool.

An arrangement 1; 101; 201; 301; 401 for a fastening element arranged in accordance with the present invention, which is intended to be used in conjunction with the anchoring of a building layer 2, 2¹, 3 along an intended attachment surface, principally for the purpose of enabling thermal insulation 2-2¹ and/or surface layers, such as rendering 3, to be applied to the outside 4A of a wall 4 or some other upright substratum, comprises a mounting bracket 5, 5¹; 105, 105¹; 205, 205¹; 305; 405 so arranged as to be secured to the intended substratum 4, a preferably stiff yet still flexible connecting device 6; 106; 206; 306; 406 extending outwards from said mounting bracket 5, 5¹; 105, 105¹; 205, 205¹; 305; 405, and a number of fastening devices 7, 7¹; 107; 207, 207¹; 307; 407; 1000, so arranged as to be capable of holding the building layer 2; 2¹; 3 in question securely in place via the connecting device 6; 106; 206; 306; 406, and is so arranged as to be capable of absorbing movements due, for example, to movements arising because of climatic variations originating partly from the elasticity of the material and partly, but principally, from the elasticity of the construction which derives from the "cable principle", in which a certain cross-section with a certain flexural rigidity has been sub-divided into a number of smaller cross-sections or threads,

each with a smaller flexural rigidity and twisted around one another in such a way that the smaller flexural rigidity of the smaller cross-sections results in a smaller flexural rigidity in the total construction, yet retaining the tensile strength.

The connecting device 6; 106; 206; 306; 406 consists in accordance with the invention of a wire-shaped flexible part, a flexible line, for example a cable made of a plastic and/or metallic material having an appropriate number of threads, etc., which is so arranged through the influence of a mounting bracket 5A; 105A; 105¹A; 205A; 205¹A; 305A; 405A as to bring about the forcible angular deformation of said device 6; 106; 206; 306; 406 from the area of said associated mounting bracket 5; 5¹; 105; 105¹; 205; 205¹; 305; 405. Said forcible downward angular deformation of the connecting device 6; 106; 206; 306; 406, for example from a central axis 8; 108; 208; 308; 408 for a mounting bracket or a mounting hole for a mounting bracket, which angle X; CX; CCX¹; CCX; CCCX; CCCCX thus formed between the mounting bracket or the hole and the connecting device is referred to as the initial angle, is an important part of the present invention, and practical tests of the invention have shown that the appropriate angular value may lie in the range 15-20°, although this initial angle X; CX; CCX; CCX¹; CCCX; CCCCX may naturally be larger or smaller than said proposed angular value. Said angular deformation is achieved forcibly relative to an imaginary normal which extends from the intended mounting bracket and from the wall surface 4A, so that the point of attachment to the mounting bracket is situated on a plane above the plane for the fastening device for the arrangement when the arrangement is attached to the intended attachment surface 4A, for example on a wall 4.

The effect of the arrangement of the connecting device with such angular deflection is intended to be utilized in such a way that the fastening device 7; 107; 207; 207¹; 307; 407 is positioned below the point of attachment on the intended upright wall 4, etc., i.e. extends downwards and outwards from the intended fastening point 9 for the fastening arrangement 1.

The first effect of the arrangement is then that the underside of the connecting device interacts with the insulation 2, 2¹, so that same is forced in towards and is held securely in position against the wall 4 or some other suitable attachment surface before a special locking means 1000 is put in position in the fastening device 7; 107; 207¹; 307; 407.

The second effect of said arrangement 1; 101; 201; 301; 401 takes place when its outer end is subjected to load, when the latter describes a downward movement along the circumference of a circle, which means that it will move inwards to-

wards the attachment plane at the same time. The initial angle is so adapted in the construction of current interest that the inward movement is "arrested" by the substratum as quickly as possible in order to prevent the downward movement from assuming excessively large proportions. The relationship between the downward movement and the inward movement in the quadrant concerned is such that the rate of increase in the downward movement reduces at the same time as the rate of increase in the inward movement increases. The inward movement generates a normal force acting against the thermal insulation 2; 2' and in so doing contributes considerably to retaining the system in place because of the frictional force which arises.

Account has also been taken in the invention of the possibility, in relation to attachment holes 10 bored, etc., into the intended wall, etc., 4 or some other means of attachment to the intended fastening point 9, of being able to connect the connecting device to all intents and purposes free from any moment, i.e. without the need to apply a bracket, hook, catch or similar. The foregoing is achieved by the connecting device 6; 106; 206; 306; 406 being so arranged as to be connected to all intents and purposes free from any moment to the mounting bracket 5; 5'; 105; 105'; 205; 205'; 305; 405 by being connected essentially to the centre of the intended attachment point 10 for the mounting bracket at the intended fastening point 9. The connecting device 6; 106; 206; 306; 406 is thus held securely at the centre of the attachment point 10, which means that any moment will be absorbed fully in said device. This means that, when a load is applied, the possibility of the displacement of the outer end because of "straightening" of a bracket, hook or catch or similar has been eliminated. Established cable technology, in which devices are pressed securely into place, in this case inserted into a hole or clamped securely between parts of a mounting bracket which, after clamping, form a hole 11; 111; 211; 311; 411, has been utilized as an important component of the invention. Apart from the possibility of varying the flexural rigidity of a cable by the appropriate choice of material, the number of strands and the gauge, use has also been made in the invention of the variation of the length L at the free end of the cable by the attachment in an appropriate fashion of one end 6A; 106A; 206A; 306A; 406A of the connecting device 6; 106; 206 to one end 12; 12'; 212 of the mounting bracket, in conjunction with which the projecting length L of the cable component, and thus its flexibility, can be "adjusted" to give the desired function.

In a first illustrative embodiment, which is shown in the drawings in Figs. 7-7C, the connecting device 6 is attached by one end 6A to one part

12; 12' of a sleeve-shaped mounting bracket, which may be constituted by an attachment block 12; 12' made of a metal material connected to the inner end of, for example, a slotted and preferably expandable attachment sleeve, and which, when a load is applied to the connecting device 6, is forced against the mounting bracket 5, to which tractive forces acting upon the connecting device 6 are transferred as compressive forces, and extends internally within the attachment sleeve 5; 5', with the part of the connecting device 6 which extends from the attachment sleeve 5; 5' being enclosed by a guide sleeve 5A projecting from the attachment sleeve 5 at the intended initial angle X. A wedge-shaped combined driving and clamping element 50, which can be accommodated in the internal space 51 of the attachment sleeve, can then be included in the arrangement 1 in order, inter alia, to permit the driving of the mounting bracket 5 into the hole 10 and to clamp the mounting bracket 5 securely in the intended attachment hole 10 at the intended fastening point 9, especially when the invention is applied for the so-called push-through assembly of intended insulation, etc., in order to be able to gain access to holes 57 extending through the insulations, etc., 2', but also in order to clamp the device 6 securely to the intended mounting bracket after the driving in of same.

In accordance with a second illustrative embodiment of the invention, which is shown in the drawings in Figs. 8-8A, the arrangement 101 thus arranged consists of a mounting bracket 105 made of a rigid material, which in one case extends perpendicularly outwards from the intended wall attachment part 105B, in which are present attachment holes 193 to accept mounting bolts, etc., 194 for securing the arrangement to the intended wall, etc., 4. A flexible cable 106 extends at the intended angle CX downwards from the central axis 108 of said hole through the angular deflection of an angled mounting bracket 105A attached to the mounting bracket 105, which angled mounting bracket can consist of a tongue, etc., enclosing the cable. A fastening device 107, which can similarly consist of a tongue which encloses the free end 106B of the cable, can exhibit attachment holes 96, 97 to accommodate an appropriate locking means 1000.

Illustrated in Fig. 8A is an example of how the downward deflection is produced by a mounting bracket 105' being angled downwards in order to achieve the effect referred to above, in conjunction with which the mounting bracket 105'A extends essentially in line with the main part of said mounting bracket 105'.

A third example of an attachment arrangement 201 in accordance with the invention is illustrated in Figs. 9-9A, in which a mounting bracket 205 and 205', which is angled at right-angles, or at the

intended initial angle CCX¹ from the foot part 290 of the intended mounting part of the intended mounting bracket 205, and from the central axis of the central axis 208 passing through the hole 293 of the foot part, in conjunction with which an extension part 275, 275¹ projecting from the outer end 206B, 206B¹ of the connecting device and connected to it by means of a mounting bracket 205A, 205¹A, is angled downwards at the intended initial angle CCX; CCX¹ in Fig. 9, or extends essentially straight in line with the downward-angled cable 206¹, Fig. 9A. Said extension parts preferably consist of curved strips of sheet metal or similar elements.

In accordance with a fourth illustrative embodiment of the invention, which is shown in the drawings in Fig. 10, the connecting device 306 is attached to a mounting stem 377 capable of being introduced into the internal space 376 inside an attachment sleeve 375, from the outer end 377A of which the connecting device 306 is caused to extend downwards at the intended initial angle CCCX by the influence of a guide sleeve 312, in conjunction with which the mounting stem 377 and preferably also the attachment sleeve 375 can be driven into an intended attachment hole by means of a driving-in tool 150 actuated by impact or by some other imparted movement and capable of interacting with a stop component 379, 380, which is preferably situated at their 375, 377 respective outer ends 375A, 377A. The assembly tool 150, which is shown in Fig. 12, can consist of a striking part 178 which is capable of being introduced into a space 181 in an assembly sleeve 182 capable of being introduced through a hole, etc., 57 through the insulation 2¹, which assembly sleeve is a part of the tool 150, in order to facilitate the assembly of a fastening element arrangement 1; 301; 401.

In accordance with a fifth illustrative embodiment of a fastening element arrangement 401, which is illustrated in the drawings in Fig. 11, its associated connecting device 406 is attached at one end 406A of the device to a mounting bracket 405A exhibiting the intended initial angle CCCCX, which mounting bracket preferably consists of a sleeve or clamp, etc., exhibiting a foot component 490, which is so arranged as to enclose and, preferably by clamping, as to retain one end 406A of the connecting device. The connecting device 406 can in this case exhibit a mounting bracket 405 comprising a hole 493 to accommodate a fastening element 194, in conjunction with which the mounting bracket 405 exhibits an abutment part 495 interacting with the head 195 of the fastening element or a washer, etc., 499.

A sleeve-shaped assembly tool 281 is also intended to be capable of being applied in conjunction with the fastening of such an arrangement 101;

201; 401 by "push-through assembly", and with the help of a driving-in tool 278 for the element which is a part of the tool 281 and is capable of being introduced into an assembly sleeve 282, the arrangement can be driven securely into place at the intended fastening point.

It is possible, by the adjustment of fastening element arrangements 1; 11; 101; 201; 301; 401, to satisfy the requirements which have been imposed, to the effect that the arrangement shall function in such a way that, on the one hand, it shall be capable of being securely attached to, for example, a facade with the subsequent assembly/installation of, for example, thermal insulation 2 plus reinforcement mesh 13, and yet shall still exhibit sufficient flexural rigidity with retained flexibility, and, on the other hand, its function shall be such that the thermal insulation shall be installed first, holes drilled through the insulation and into, for example, any underlying wall 4, whereupon the arrangement shall be capable, with the help of special tools, of being introduced through the insulation 2 and into the attachment hole 10. A distinction is thus made here between two alternatives: PUSH-ON ASSEMBLY, an example of which is shown in Figs. 1-2, and PUSH-THROUGH ASSEMBLY, an example of which is shown in Figs. 3-4. In the case of the push-through alternative, the use of a special tool may be necessary, especially if quite large thicknesses of insulation are to be penetrated. Such tools 150 and 281 are shown respectively in Figs. 12 and 13.

The method of "clothing" the cable with a close-fitting rigid tube is used in order to bring about angular deformation of the cable at the point where it leaves the attachment hole. The tube, which is under tension at the same time as the cable, is bent in this way to the desired angle.

The connecting device 7; 7¹; 107; 207; 207¹; 307; 407 appropriately exhibits at least two accommodating openings 96, 97 distributed along the longitudinal extent of said device, which openings are situated at a certain distance from an associated mounting bracket which is a part of the arrangement, and are capable of interacting with a locking means 1000. The locking means may consist of a curved spring locking means, as shown in Fig. 5, the inserted end 1000A of which is slightly curved to enable it to be inserted more easily into the lock holes, and with a widened stop part 1000B, formed by flattening, for example, being so arranged as to prevent the locking means from falling through the intended hole 96, 97. The outer part of the pendulum part and the spring locking means 1000 are so adapted to one another that the spring locking means will snap into engagement with the substratum. This effect means that the locking means will not interfere with the rendering

work, for example. Apart from this, the spring locking means is constructed in such a way that it will make uniform contact with the substratum around the "locking point".

Shown in Fig. 6 is the manner in which notches 98; 99 in the connecting device 7 can be so arranged as to interact with intended locking devices 1000, so that these are held securely transversely, and as to facilitate, inter alia, rendering work, etc.

An inner hole 96 is intended, via an inserted locking means 1000, to hold a layer 2, 2¹ of thermal insulation, for example, in position until the following operation, i.e. the application of reinforcing mesh 13 before, for example, rendering is carried out, when a locking arrangement is also introduced into the outermost hole 97 in order to hold the reinforcing mesh 13, for example, in position.

This gives the following effects:

I) The layer 2, 2¹ of thermal insulation is retained by the first locking means.

II) When the mesh 13 is applied, it will lie on top of the first locking means and will thus be held at a certain distance from the layer 2 of thermal insulation by resting against the first installed locking means.

III) The first advantage of this is that the rendering material 3 will "embed" the mesh 13 on all sides, and in so doing will strengthen the reinforcement effect in particular and will also enhance the protection against corrosion to a certain degree.

IIII) The second advantage is that it is easier to erect and lock the reinforcing mesh 13 on top of this, maintaining an almost plane surface. It is already known, of course, that if a "sheet" (= the mesh) is deformed through denting-in in the field, the result is that it will be dented in the opposite direction in other places. The measure described here means that the work involved in distributing dents is reduced. It has been found to be beneficial from a practical point of view to ensure that the installation of the mesh is as flat as possible, and that the mesh 13 itself is similarly as flat as possible on delivery.

The invention is not restricted to the illustrative examples described above and shown in the drawings, but may be modified within the scope of the Patent Claims without departing from the idea of invention.

Claims

1. Anchoring device for anchoring a building layer (2; 2¹; 3; 13) to an attachment surface (4A) of a substrate (4) such as a wall, which device comprises a mounting bracket (5, 5¹; 105,

105¹; 205, 205¹; 305; 405) for attachment to the substrate, a connecting device (6; 106; 206; 306; 406) extending outwardly from the mounting bracket for extending through the building layer, a fastening device (7, 7¹; 107; 207, 207¹; 307; 407) attached to the opposite end of the connecting device and a fastening element (1000) co-operating with the fastening device for securing the building layer to the attachment surface via the connecting element, **characterized in** that the connecting device is in the form of a flexible cable (6; 106; 206; 306; 406) made of metallic material which extends downwardly from the mounting bracket at an initial inclination angle (X; CX; CCX; CCX¹; CCCX; CCCCX) relative to the normal extending from the vertical plane of the mounting bracket, so that angular deformation is achieved forcibly in the flexible cable.

2. Anchoring device in accordance with Patent Claim 1, **characterized in** that the connecting device (6; 106; 206; 306; 406) is attached by one end (6A) to one part (12) of a sleeve-shaped mounting bracket (5), and extends internally inside a slotted and expandable intended attachment sleeve (5) (Figs. 7-7C).

3. Anchoring device in accordance with Patent Claim 2, **characterized in** that the part of the connecting device (6) which extends from the attachment sleeve (5) enclosed by a guide sleeve (5A) projecting from the attachment sleeve (5) at the intended initial angle (X).

4. Anchoring device in accordance with either of the preceding Patent Claims 2-3, **characterized in** that a wedge-shaped combined driving and clamping element (50) is capable of being accommodated in the internal space (51) in order, inter alia, to permit the driving of the mounting bracket and the clamping of the mounting bracket securely in the intended attachment hole (10) at the intended fastening point (9).

5. Anchoring device in accordance with Patent Claim 1, **characterized in** that the connecting device (306) is attached to a mounting stem (377) capable of being introduced into the internal space (376) inside an attachment sleeve (375), from the outer end (377A) of which the connecting device (306) is caused to extend downwards at the intended initial angle (CCCX) by the influence of a guide sleeve (312) (Fig. 10), and in that the mounting stem (377) and preferably also the attachment sleeve (375) exhibit a stop component (379, 380) capable of

interacting with a driving-in tool (150), which stop component is preferably situated at their respective outer ends (375A, 377A).

6. Anchoring device in accordance with Patent Claim 1, **characterized in** that the connecting device (406) is attached at one of its ends (406A) to a mounting bracket (405) exhibiting the intended initial angle (CCCCX), preferably consisting of a sleeve or clamp, etc., exhibiting a foot component (490), which is so arranged as to enclose and to clamp securely one end (406A) of the connecting device (Fig. 11). 5 10
7. Anchoring device in accordance with Patent Claim 6, **characterized in** that the connecting device (406) exhibits a mounting bracket (405) comprising a hole (493) to accommodate a fastening element (194), in conjunction with which the mounting bracket (405) exhibits an abutment part (495) interacting with the head, etc., of the fastening element. 15 20
8. Anchoring device in accordance with any of the preceding Patent Claims, **characterized in** that the connecting device (7) exhibits at least two accommodating openings (96, 97) distributed along the longitudinal extent of the device, which openings are situated at a certain distance from an associated mounting bracket and are capable of interacting with locking means (1000). 25 30
9. Anchoring device in accordance with any of the preceding Patent Claims, **characterized in** that the initial inclination angle (X; CX; CCX; CCX¹; CCCX; CCCCX) lie in the range of 15-20°. 35

Patentansprüche 40

1. Verankerungsvorrichtung zum Verankern einer Baustoffschicht (2, 2¹, 3, 13) an einer Befestigungsoberfläche (4A) eines Befestigungsgrundes (4), etwa einer Wand, mit einem Anbindungselement (5, 5¹; 105, 105¹; 205, 205¹; 305; 405) zur Befestigung an dem Befestigungsgrund, mit einem Verbindungselement (6; 106; 206; 306; 406), das sich von dem Anbindungselement wegweisend durch die Baustoffschicht erstreckt, mit einer am gegenüberliegenden Ende des Verbindungselements angeordneten Spannvorrichtung (7, 7¹; 107; 207, 207¹, 307; 407) und mit einem Befestigungselement (1000), das über das Verbindungselement mit der Spannvorrichtung zum Befestigen der Baustoffschicht an der Befestigungsoberfläche zusammenwirkt, **dadurch gekennzeichnet**, daß 45 50 55

das Verbindungselement ein flexibles Seil (6; 106; 206; 306; 406) aus einem metallischen Werkstoff ist, das sich in einem Ausgangsneigungswinkel (X; CX; CCX, CCX¹; CCCX; CCCCX) bezüglich der von der vertikalen Ebene des Anbindungselementes ausgehenden Normalen von dem Anbindungselement nach unten weisend erstreckt, so daß sich zwangsläufig eine Abwinklung des flexiblen Seiles einstellt.

2. Verankerungsvorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß das Verbindungselement (6; 106; 206; 306; 406) an einem Ende (6A) an einem Element (12) eines hülsenförmigen Anbindungselementes (5) angebracht ist und sich innen durch die vorgesehene geschlitzte und dehnbare Befestigungshülse (5) erstreckt (Fig. 7 bis Fig. 7C).
3. Verankerungsvorrichtung nach Anspruch 2, dadurch gekennzeichnet, daß der Abschnitt des Verbindungselements (6), der in einer Führungshülse (5A) von der Befestigungshülse (5) wegweisend angeordnet ist, von der Befestigungshülse (5) in dem vorgesehenen Ausgangswinkel (X) wegweist.
4. Verankerungsvorrichtung nach einem der Ansprüche 2 oder 3, dadurch gekennzeichnet, daß ein keilförmiges kombiniertes Eintreib- und Klemmelement (50) in den Innenraum (51) einsetzbar ist, um unter anderem das Eintreiben des Anbindungselementes und das sichere Verkleben des Anbindungselementes in dem vorgesehenen Befestigungsloch (10) im vorgesehenen Befestigungspunkt (9) zu erlauben.
5. Verankerungsvorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß das Verbindungselement (306) an einem Befestigungsstopfen (377) angebracht ist, der von dem äußeren Ende (377A), von dem das Verbindungselement (306) in dem vorgesehenen Ausgangswinkel (CCCX) durch eine Führungshülse (312) (Fig. 10) nach unten gedrückt wird, in den Innenraum (376) einer Befestigungshülse (375) einführbar ist, und daß der Befestigungsstopfen (377) und vorzugsweise auch die Befestigungshülse (375) ein mit dem Eintreibwerkzeug (150) zusammenwirkendes Anschlagelement (379, 380) aufweisen, wobei das Anschlagelement vorzugsweise an den jeweiligen äußeren Enden (375A, 377A) angeordnet ist.
6. Verankerungsvorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß das Verbindungselement (406) an einem Ende (406A) an einem

Anbindungselement (405) befestigt ist, das den vorgesehenen Ausgangswinkel (CCCCX) aufweist und das vorzugsweise aus einer einen Fußbereich (490) aufweisenden Hülse oder einer Klemme oder dergleichen besteht, die so angeordnet ist, daß ein Ende (406A) des Verbindungselements umschlossen und sicher verklemmt ist (Fig. 11).

7. Verankerungsvorrichtung nach Anspruch 6, dadurch gekennzeichnet, daß das Verbindungselement (406) ein Anbindungselement (405) mit einem Loch (493) zur Aufnahme eines Befestigungselementes (194) aufweist, das zusammenwirkend mit dem Anbindungselement (405) als Widerlager (495) ausgebildet ist und das mit dem Kopf oder dergleichen eines Befestigungselements zusammenwirkt.

8. Verankerungsvorrichtung nach einem der vorstehenden Ansprüche, dadurch gekennzeichnet, daß das Verbindungselement (7) wenigstens zwei Aufnahmeöffnungen (96, 97) aufweist, die in axialer Verlängerung des Elements vorgesehen sind, wobei die Öffnungen in einem gewissen Abstand von einem entsprechenden Anbindungselement angeordnet sind und wobei diese zur Aufnahme von Sicherungsmitteln (1000) geeignet sind.

9. Verankerungsvorrichtung nach einem vorstehenden Ansprüche, dadurch gekennzeichnet, daß der Ausgangsneigungswinkel (X; CX; CCX, CCX¹; CCCX; CCCCX) zwischen 15 und 20 Grad ist.

Revendications

1. Dispositif d'ancrage pour fixer une nappe de revêtement (2, 2¹ ; 3 ; 13) sur la surface de fixation (4A) d'une structure (4), par exemple un mur, ledit dispositif comprenant un crochet de montage (5, 5¹ ; 105, 105¹ ; 205, 205¹ ; 305, 405) pour la fixation sur la structure, un moyen de connexion (6 ; 106 ; 206 ; 306 ; 406) s'étendant extérieurement au crochet de montage pour traverser la nappe de revêtement, un dispositif d'attache (7, 7¹ ; 107 ; 207, 207¹ ; 307 ; 407) prévu à l'extrémité opposée du moyen de connexion, et une attache (1000) coopérant avec le dispositif d'attache pour arrimer la nappe de revêtement sur la surface de fixation via l'élément de connexion, caractérisé en ce que le moyen de connexion est formé d'un câble flexible (6 ; 106 ; 206 ; 306 ; 406) en matériau métallique, incliné vers le bas par rapport au crochet de montage avec un angle initial d'inclinaison (X ; CX ; CCX ; CCX¹ ;

CCCX ; CCCCX) par rapport à la position normale du plan vertical du crochet de montage, de façon à produire une déformation angulaire dans le câble flexible.

2. Dispositif selon la revendication 1, caractérisé en ce que le moyen de connexion (6 ; 106 ; 206 ; 306 ; 406) est fixé par une de ses extrémités (6A) sur une partie (12) d'un crochet de montage (5) en forme de douille, et s'étend à l'intérieur d'une douille de fixation (5) creuse et expansible.

3. Dispositif selon la revendication 2 caractérisé en ce que la partie du moyen de connexion (6) qui sort de la douille de fixation (5) est enfermée dans un fourreau de guidage (5a) sortant de la douille de fixation (5) avec l'angle initial prévu (X).

4. Dispositif selon l'une des revendications 2 à 3, caractérisé en ce qu'un élément d'ancrage et d'enfoncement (50) en forme de clavette est apte à pénétrer dans un espace intérieur (51) dans le but de réaliser l'enfoncement du crochet de montage et son ancrage dans le trou (10) du point de fixation prévu (9).

5. Dispositif selon la revendication 1 caractérisé en ce que le moyen de connexion (306) est lié à une tige (377) pouvant être introduite dans l'espace intérieur (376) d'une douille de fixation (375), à l'extrémité (377A) de laquelle un moyen de connexion (306) est plié vers le bas avec l'angle initial d'inclinaison prévu (CCCX) sous l'action d'une douille de guidage (312), en ce que la tige (377) et de préférence la douille de fixation (375) présentent un élément d'arrêt (379, 380) apte à coopérer avec un outil d'enfoncement (150), lesdits éléments d'arrêt étant situés à l'extérieur des deux extrémités (375A, 377A).

6. Dispositif selon la revendication 1 caractérisé en ce que le moyen de connexion (406) est fixé par une de ses extrémités (406A) à un crochet de montage (405) présentant l'angle initial d'inclinaison (CCCCX) prévu, et ayant de préférence la forme d'une douille ou d'une pince, avec un élément retour (490), ledit crochet de montage étant également prévu pour enfermer et pincer une extrémité (406A) du moyen de connexion.

7. Dispositif selon la revendication 6 caractérisé en ce que le moyen de connexion (406) présente un crochet de montage (405) comportant d'une part un trou (493) pour le passage d'un

élément de fixation (194) et d'autre part un moyen de butée (495) coopérant avec la tête ou équivalent, de l'élément de fixation.

8. Dispositif selon l'une des revendications précédentes caractérisé en ce que le dispositif d'attache (7) présente au moins deux ouvertures (96, 97) placées dans le prolongement du dispositif, lesdites ouvertures étant situées à une certaine distance d'un crochet de montage associé et étant aptes à coopérer avec un moyen de verrouillage (1000). 5 10
9. Dispositif selon l'une des revendications précédentes caractérisé en ce que l'angle initial d'inclinaison (X ; CX ; CCX ; CCX1 ; CCCX ; CCCCX) est compris entre 15 et 20°. 15

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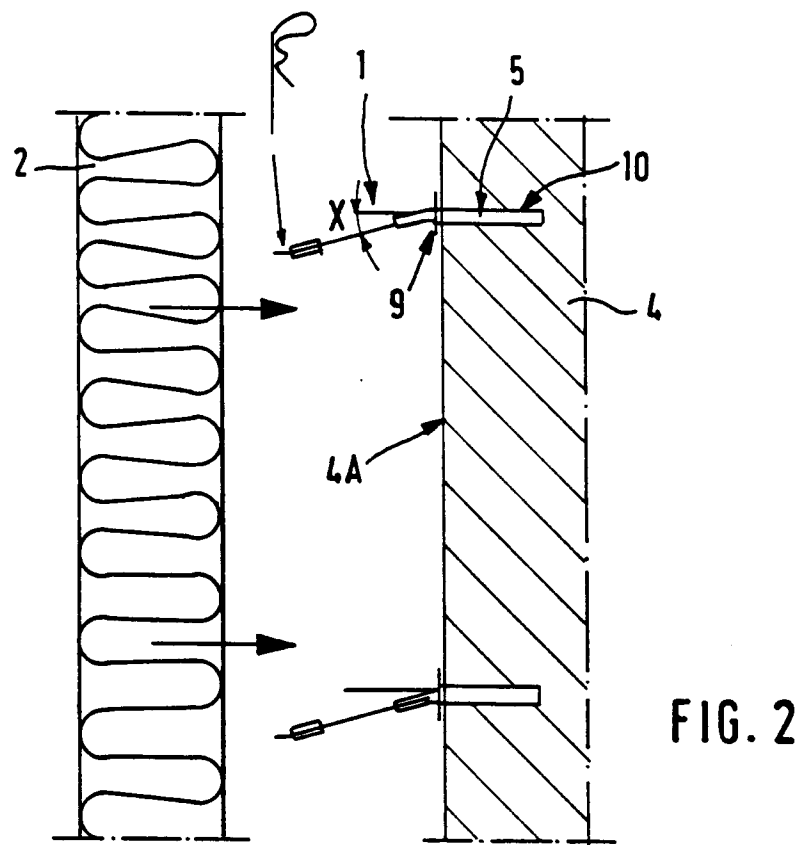
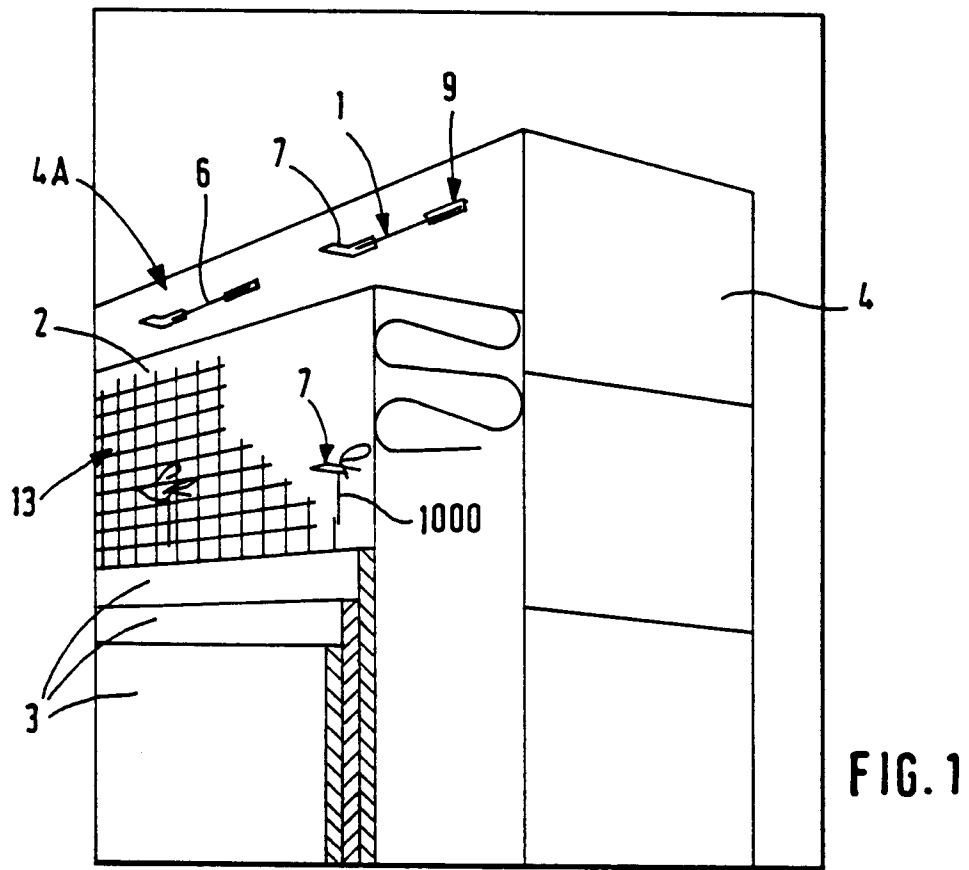
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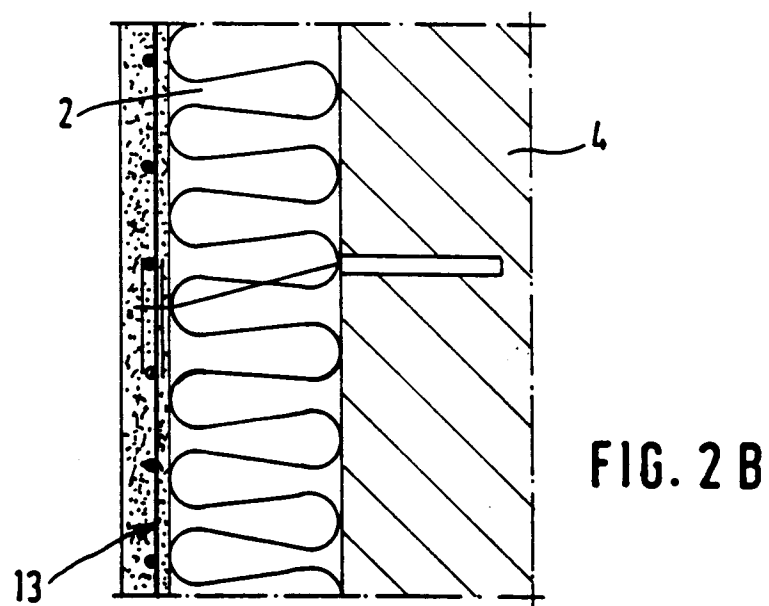
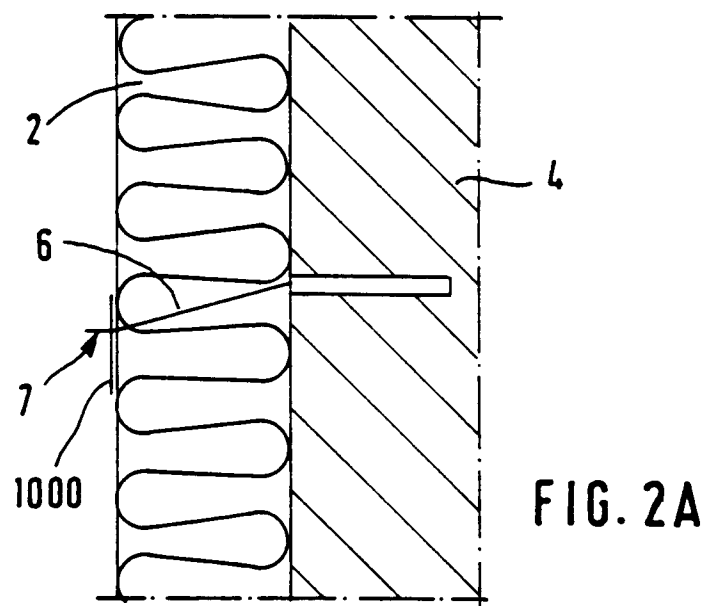
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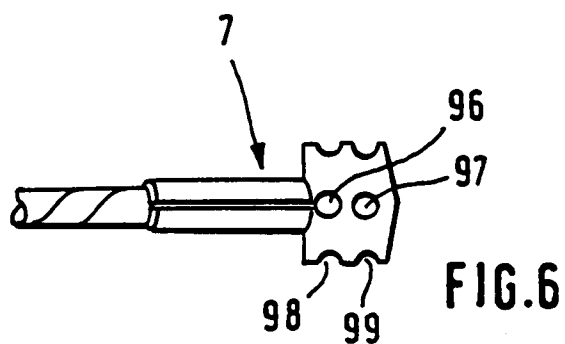
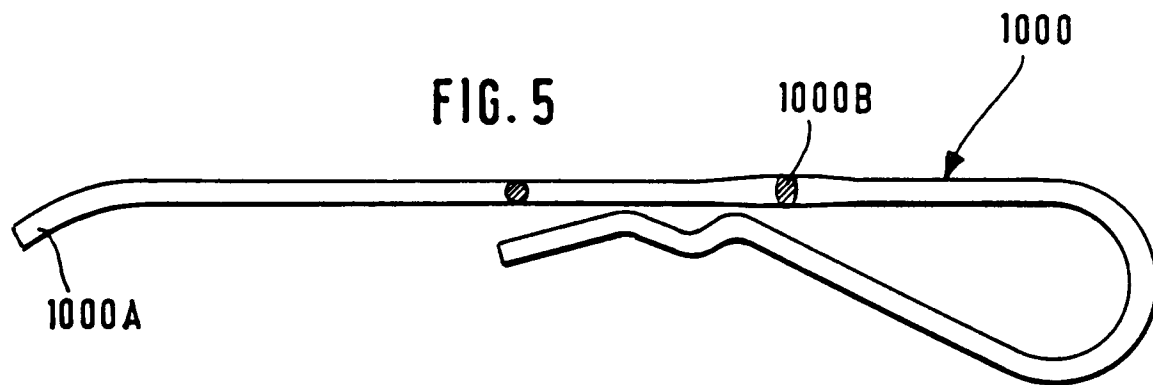
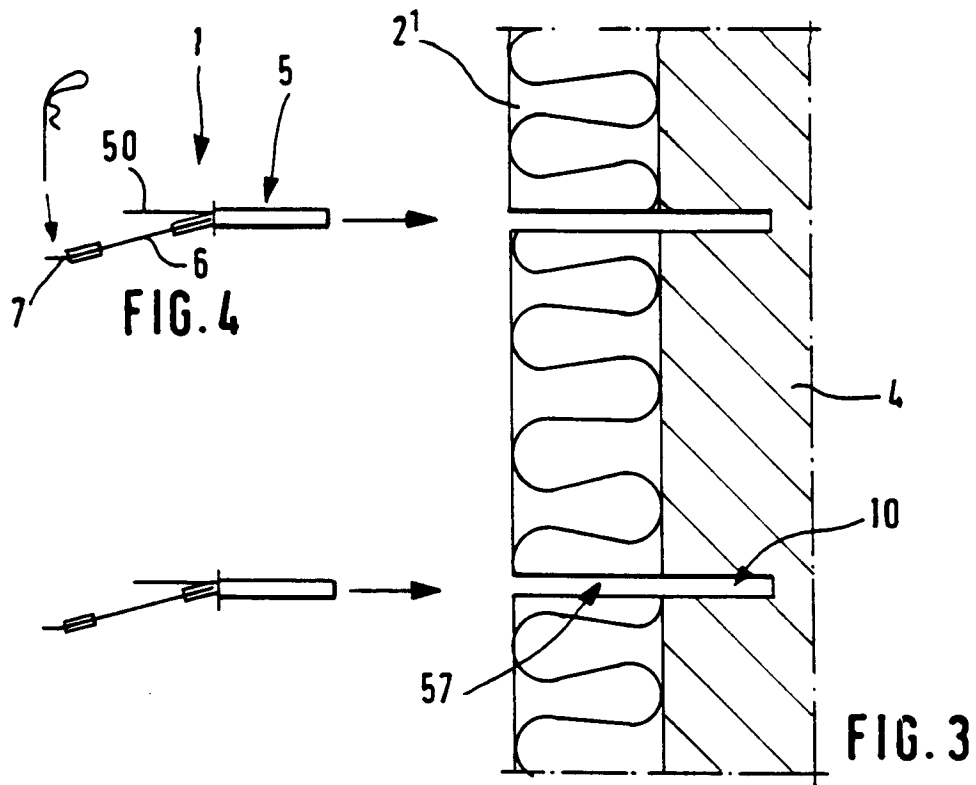
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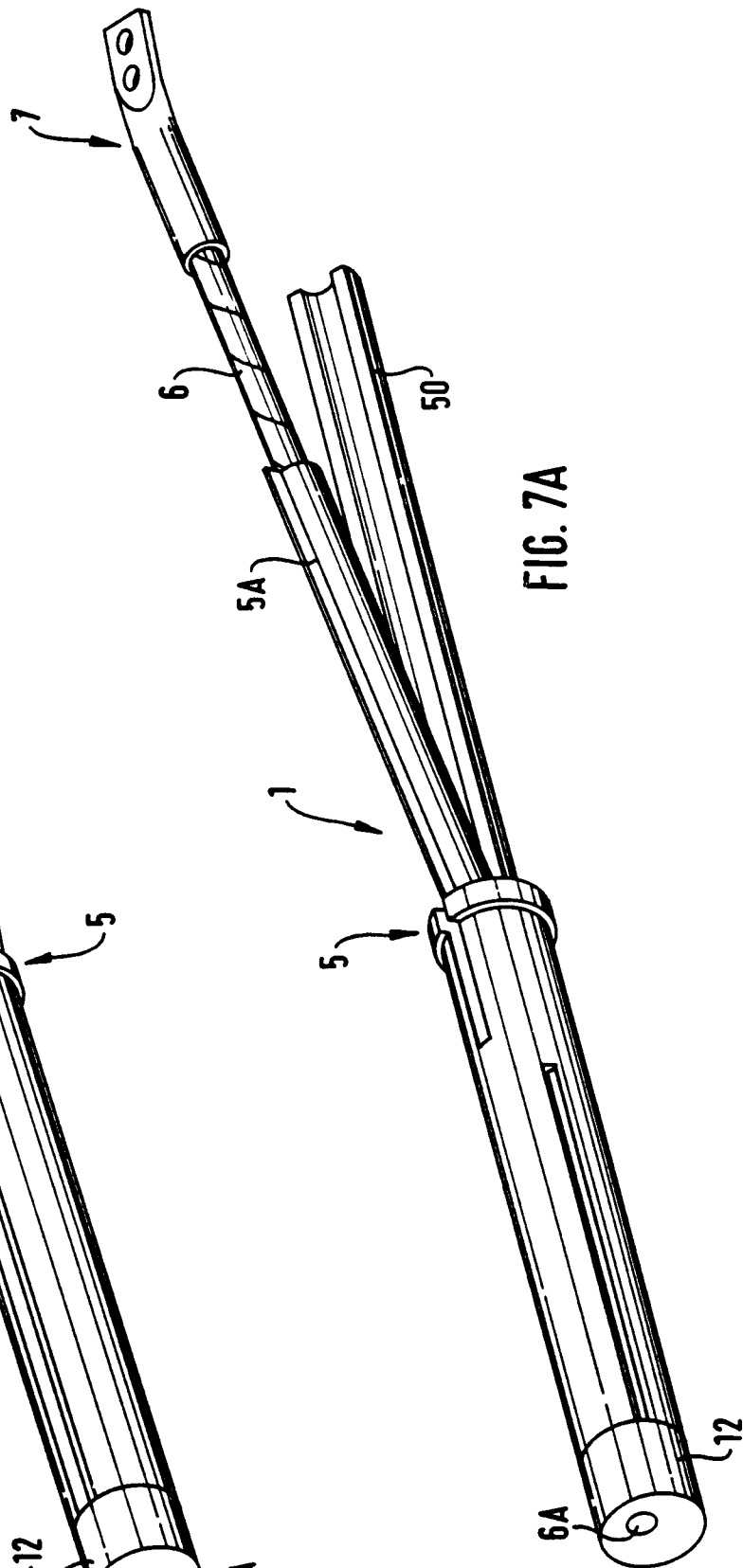
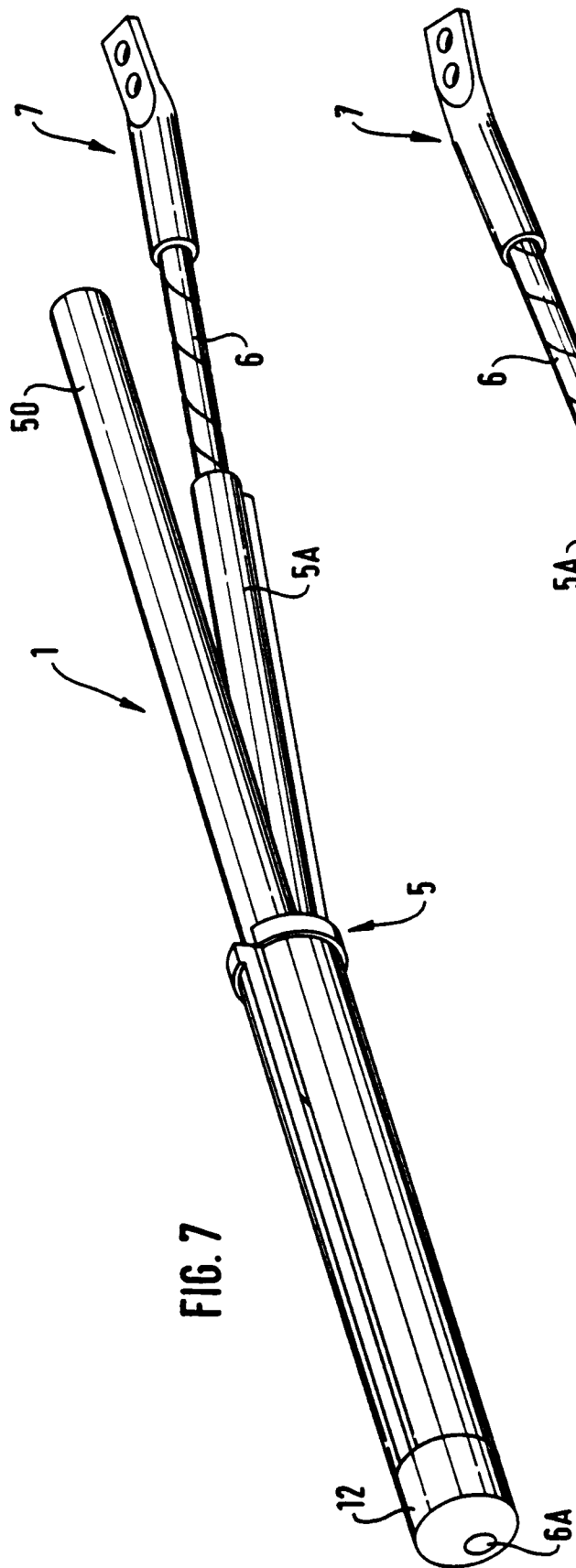
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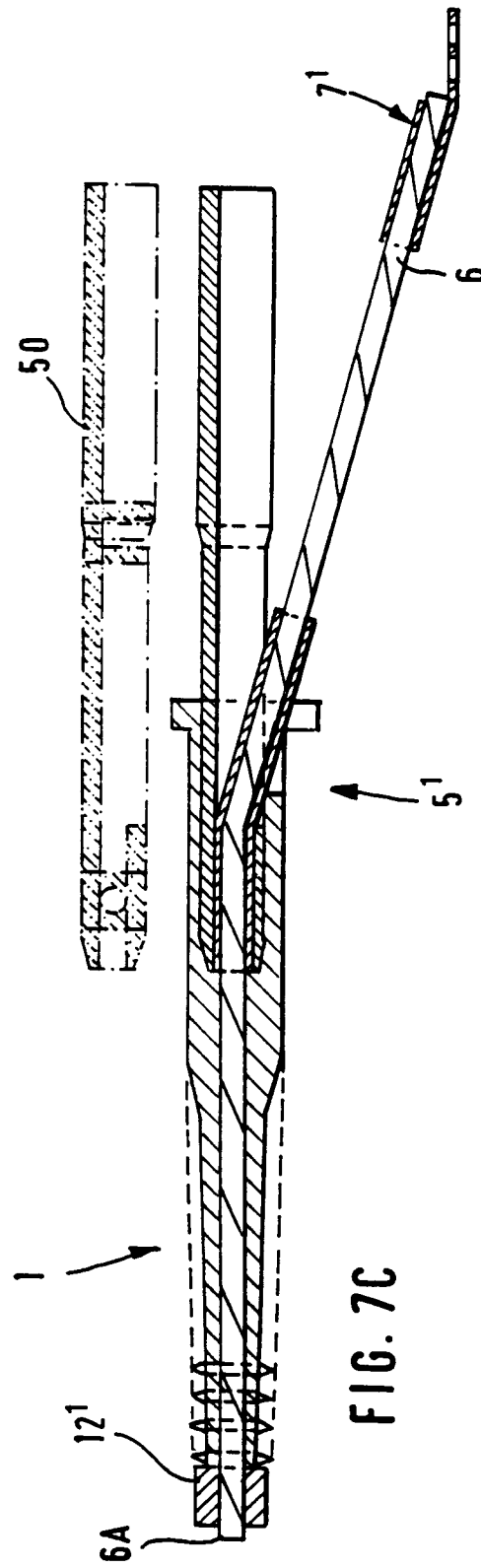
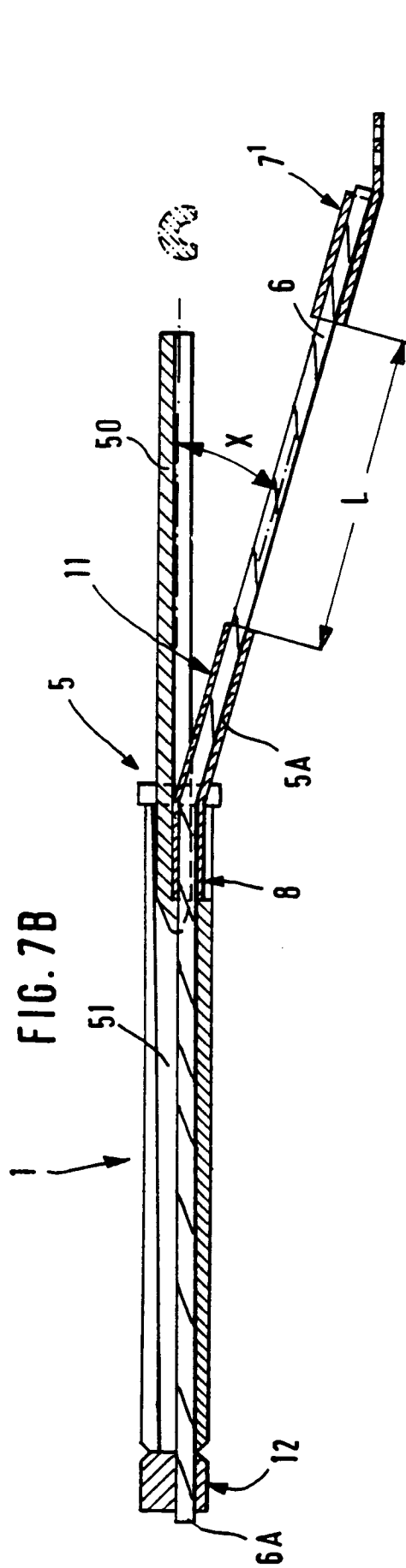
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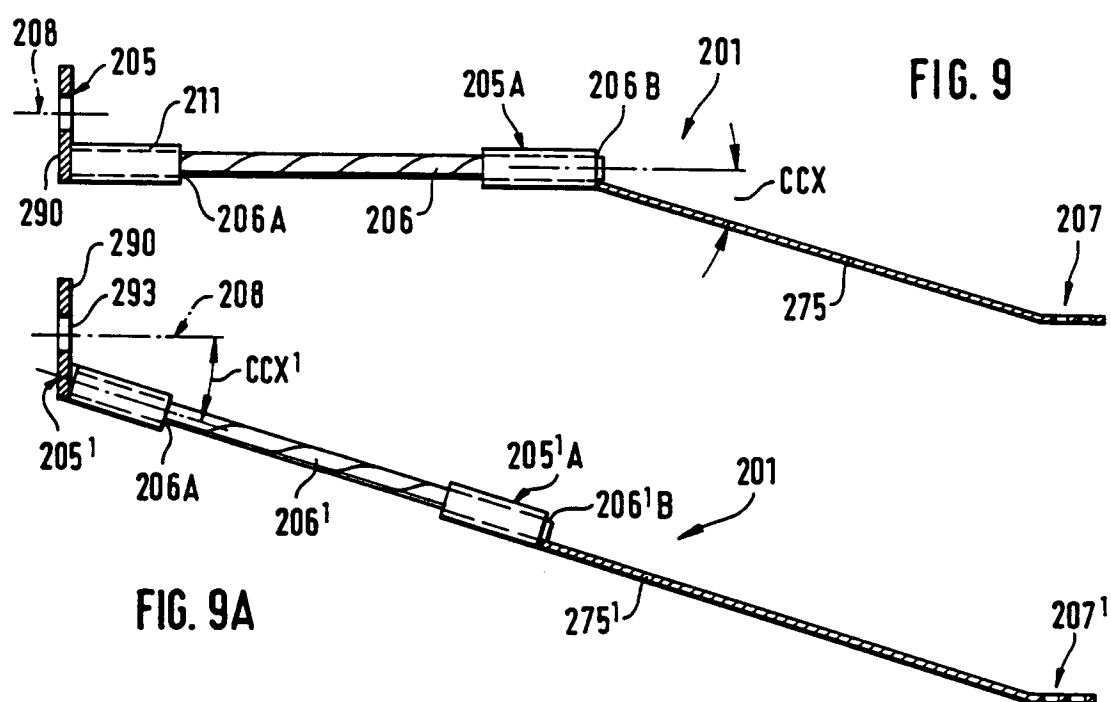
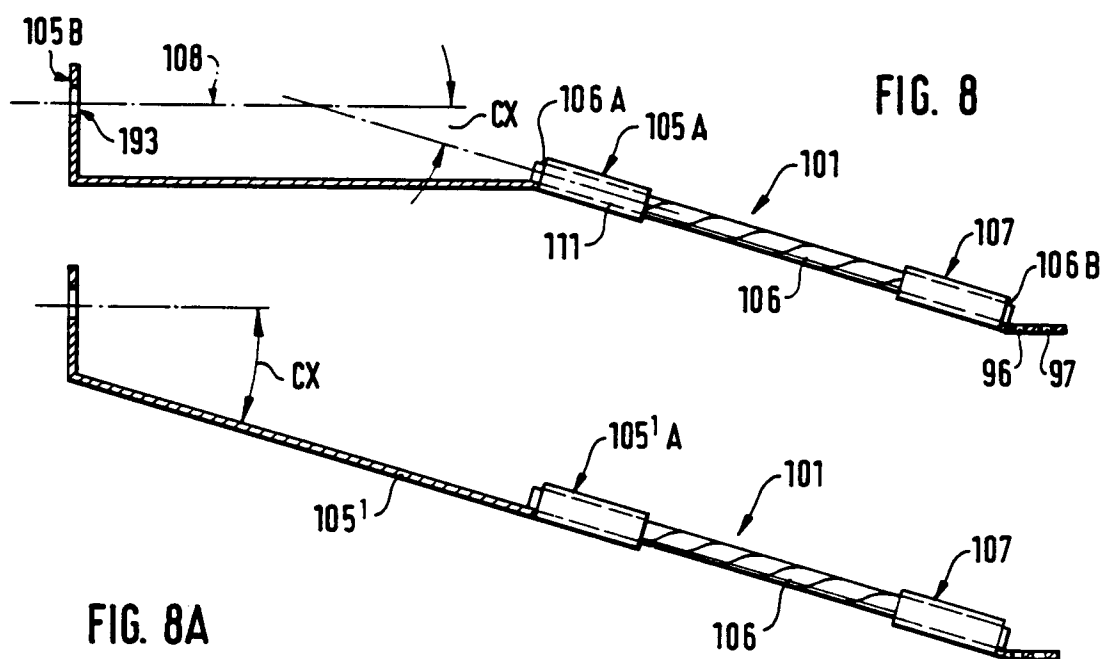












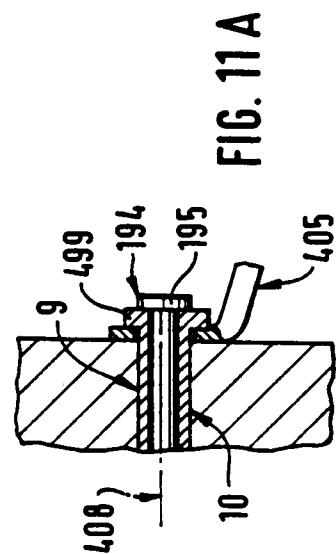
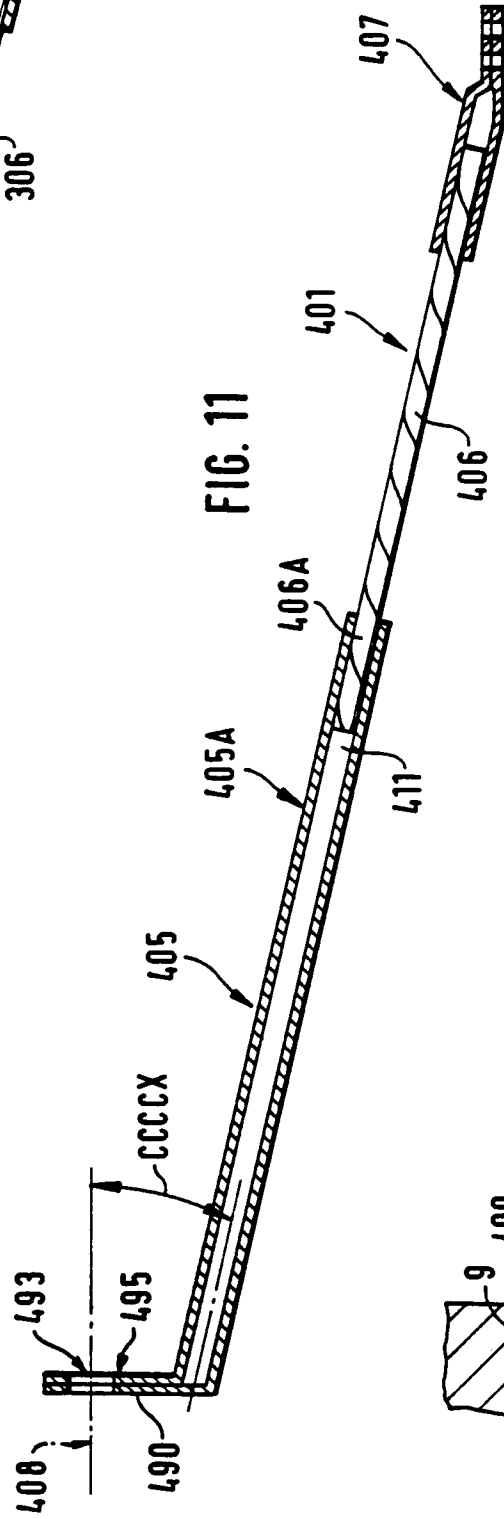
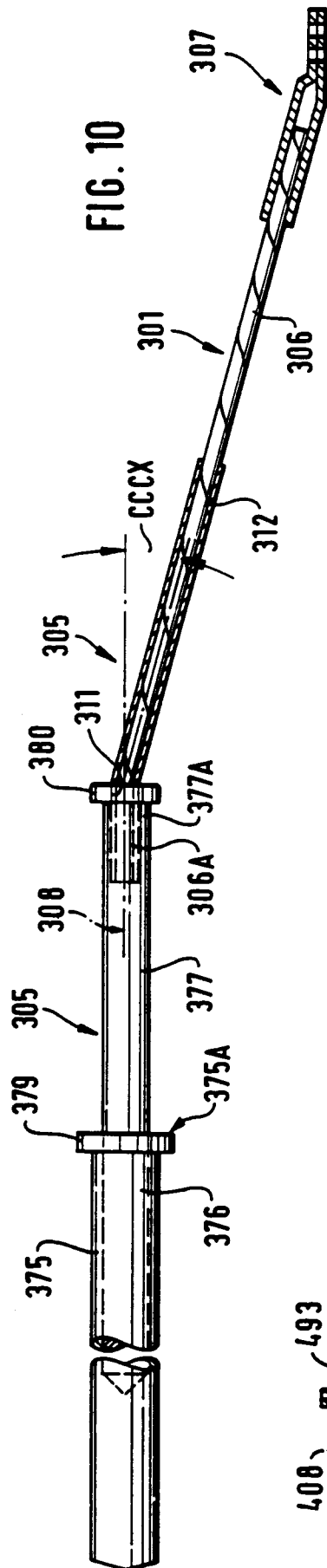


FIG. 12

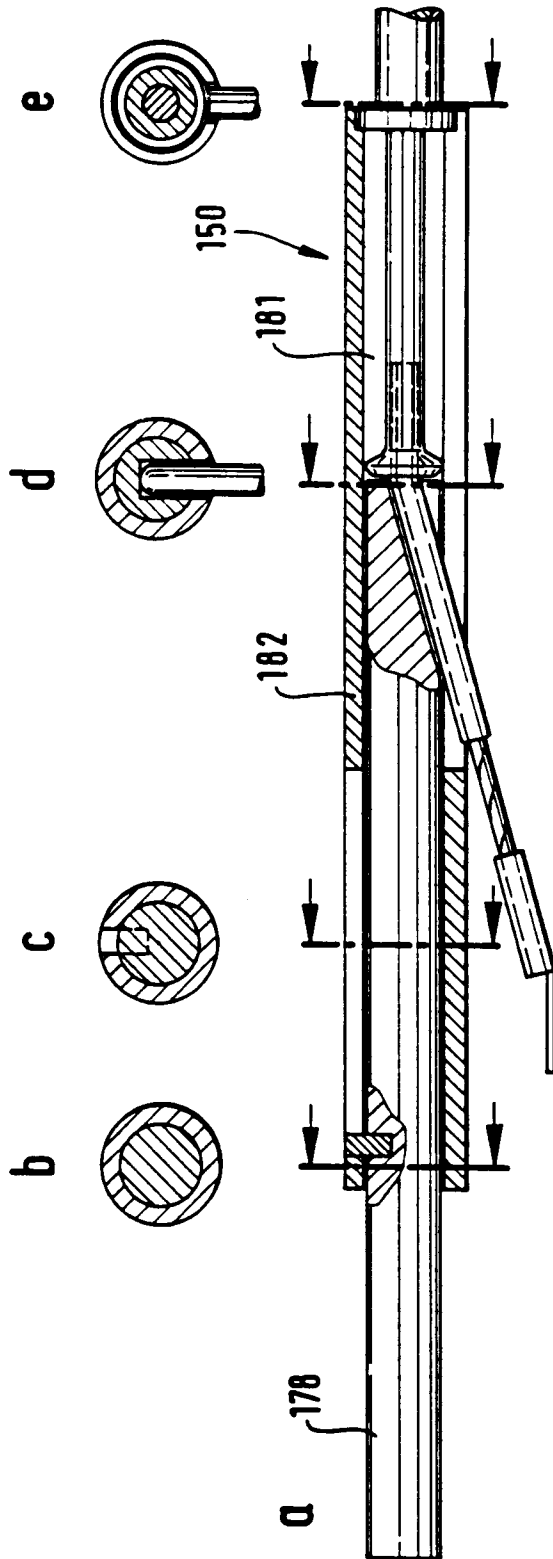


FIG. 13

