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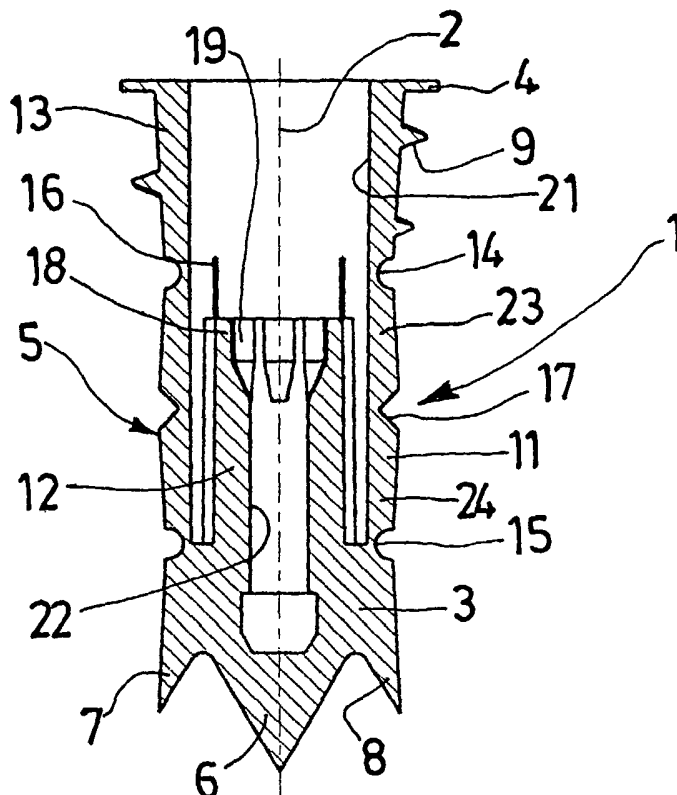
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(54) Title: ANCHOR BOLT FOR FRIABLE MATERIAL, HAVING A TELESCOPIC BODY



(57) Abstract: The bolt comprises a substantially cylindrical body provided with a bore (22) for receiving a fastener and including an external screw thread (9), with, at one end of the body, a drilling portion (3), at the other end of the body, a supporting collar (4), and, between the drilling end and the supporting collar, an intermediate folding umbrella portion (5). The bolt body is telescopic and includes an internal sleeve (12) for receiving the fastener and an external folding umbrella casing (11).



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ANCHOR BOLT FOR FRIABLE MATERIAL, HAVING A TELESCOPIC BODY

The invention relates to an anchor bolt for friable material, such as a dry partition panel, e.g. of the type referred to by the trademark Placoplâtre.

5

The invention relates more particularly to an anchor bolt for friable material, comprising a substantially cylindrical body with a drilling end and, at the other end, a supporting collar and a screw thread, a bore being drilled through the body in order to receive a fastener.

10 In order to insert a bolt of this kind into a substrate of friable material, to return to this example, the bolt simply has to be screwed into the substrate, with no need for a hole to be drilled in the substrate in advance, as is the case with numerous other anchor bolts. This greatly simplifies fixing.

15 Once the bolt has been anchored in the substrate, a fastener is introduced through a component, for example, and into the bore in the body of the bolt in order to fasten the component to the substrate.

A bolt of the type defined hereinabove is known from the document EP 0 165 674.

20

When the panel into which the bolt is to be inserted is a hollow panel or has quite a small thickness, smaller than the length of the bolt, it has already been proposed with a view to obtaining a larger material surface to design a portion of the body of the bolt, in this case a slotted intermediate portion, in such a manner that, as a result of the tensile force
25 applied by the fastener, this intermediate portion is folded back on to itself, thereby moving away from the axis of the bolt in order to form flanges bearing against the rear surface of the material, the bolt in practice being shortened accordingly. This is then referred to as a supplementary "umbrella" fastening.

30 An umbrella bolt of this kind for friable material has several disadvantages. The lateral flexion of the umbrella portion of the body is not well controlled. The opening of the umbrella, i.e. the expansion, is limited only by the bearing application of the ribs of the umbrella, to such an extent that fracture of the body may occur during expansion.

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The aim of the invention of this application is, in particular, to avoid disadvantages of this kind.

5 This application therefore relates to an anchor bolt for friable material, comprising a substantially cylindrical body provided with a bore for receiving a fastener and including an external screw thread, with, at one end of the body, a drilling portion, at the other end of the body, a supporting collar and, between the drilling end and the supporting collar, an intermediate folding umbrella portion, characterised in that the bolt body is telescopic and
10 includes an internal sleeve for receiving the fastener and an external folding umbrella casing.

As a result of the telescopic design of the bolt, the lateral flexion of the external casing is well controlled, as the tensile force applied to the fastening sleeve is closer to the front
15 surface of the material against which the collar bears.

It will be noted that the bolt of the invention displays excellent tensile strength, greater than that of bolts without an umbrella. The expansion moreover stops substantially when the planes of the supporting collar and the internal end of the sleeve coincide.
20

In addition, as the external umbrella casing is adjacent to the drilling end, the external screw thread of the bolt body, which preferably extends solely between the supporting collar and the umbrella casing, does not damage the hole formed beforehand by the drilling end.
25

In the preferred embodiment of the invention, the internal sleeve is designed to be driven in rotation by a driving tool.

This prevents any torsion of the intermediate umbrella portion which could have an adverse effect on the behaviour of the bolt during the anchoring of the bolt.
30

The internal end of the sleeve directed towards the supporting collar advantageously includes a recess for driving it in rotation.

The pitch of the external screw thread extending between the supporting collar and the external umbrella casing is also advantageously greater than or equal to substantially half the thickness of the material intended to receive the bolt and, preferably, less than or
5 equal to substantially this thickness.

The advantage of having a large screw thread pitch is that there is no damage to the material, thereby ensuring proper anchoring.

10 The bolt also advantageously includes connecting means designed to connect the portion of the body including the supporting collar and the internal end of the sleeve once the sleeve has been displaced in the external casing. If the bolt displays elasticity, an arrangement of this kind prevents the umbrella from opening.

15 The invention will be more readily understood with the aid of the following description of the preferred embodiment of the bolt, with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of the bolt;
20

Figure 2 is a cut-away side view of the bolt of Figure 1, with the internal sleeve removed;

Figure 3 is an axial section of the bolt of Figure 1, and
25

Figure 4 is an axial section of the bolt once it has been anchored in a receiving material.

The anchor bolt shown in the drawings includes a generally cylindrical body 1 having an axis 2 with a drilling end 3, the body including at the end opposite the drilling end a
30 supporting and fastening collar 4 and, between the collar and the drilling end, an intermediate folding portion 5 which is an anchoring and fastening portion.

The drilling end 3 is provided at its free end with three drilling teeth, in this case a central tooth 6 and two shorter lateral teeth 7, 8.

5 An external screw thread 9 winds around the bolt body, in this case, in a clockwise-rotating direction, from the supporting collar 4 to the intermediate folding portion 5. The pitch of this thread is large relative to the thickness of the material 10 (Figure 4) in which the bolt is intended to be anchored. As will be seen in this figure, the pitch is in this case equal to approximately half this thickness. The intermediate folding portion 5 is telescopic and includes an external casing 11 and an internal sleeve 12.

10

The external casing is connected to the body portion 13 adjacent to the collar 4 and provided with the thread 9 by a small tapered annular zone 14 allowing for folding. In a similar manner, the external casing is connected to the drilling end 3 by a tapered annular zone 15 allowing for folding. The external casing is slotted in radial planes in order to allow for the folding thereof. In this example, four slots 16 have been provided (Figure 1).

The casing 11 includes a weakened peripheral annular zone 17 in a transverse mid-plane, once again in order to allow for the folding thereof.

20

The internal sleeve 12 extends the drilling end 3 towards the collar 4 beyond the connecting zone 15 along a narrowed section even smaller than the internal section of the casing 11 to a free internal end 18 extending to just this side of the transverse mid-plane of the connecting zone 14. This internal end 18 is provided with a recess 19, in this case a Phillips head, in order to drive the sleeve 12 and, with it, the entire bolt, in rotation.

25

The bolt body is a tubular element including a first bore 21 extending over the body portion 13 adjacent to the collar 4 and the external casing 11 and also and above all a second bore 22 drilled in the annular sleeve 12 in order to receive a fastener, such as a screw.

30

In order to anchor the bolt in the board 10, it is pressed against the material by means of its drilling end 3 and driven in rotation by a tool engaged in the recess 19 in the sleeve 12.

The drilling end 3 forms a hole first in the sheet of cardboard 20 on the surface of the board, then in the material of the board before the screw thread 9 beyond the external casing 11 engages with the material of the board 10, without damaging the hole drilled in advance, and before the collar 4 comes to bear against the sheet 20 of the board 10.

5

Once the bolt has been anchored in the board 10, the procedure for fastening a component to the board 10 is as follows.

10 The component to be fastened is placed against the board 10, i.e. against the sheet 20 and the collar 4, then a fastening screw is introduced into the bore 22 in the sleeve 12 through the component including a through orifice, either naturally or after the drilling operation.

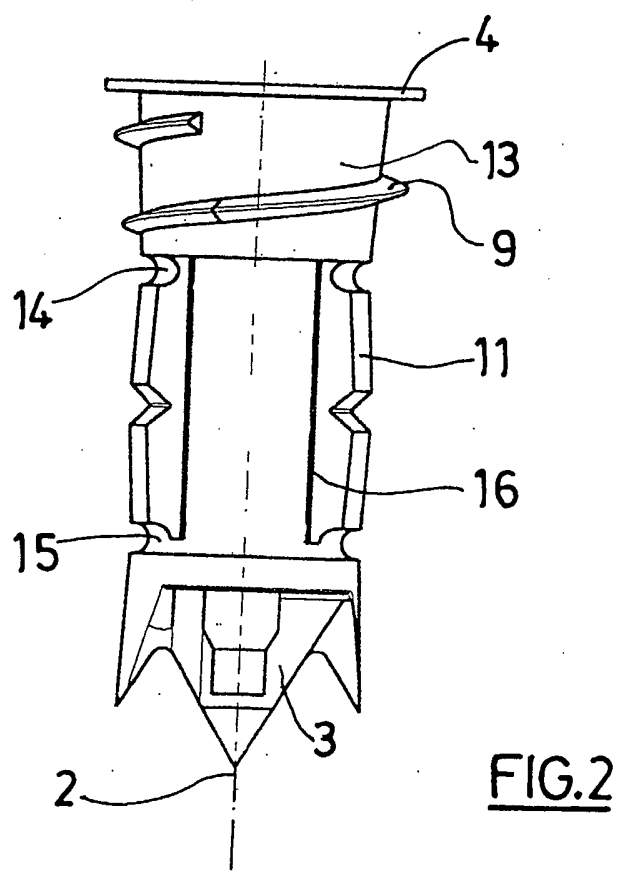
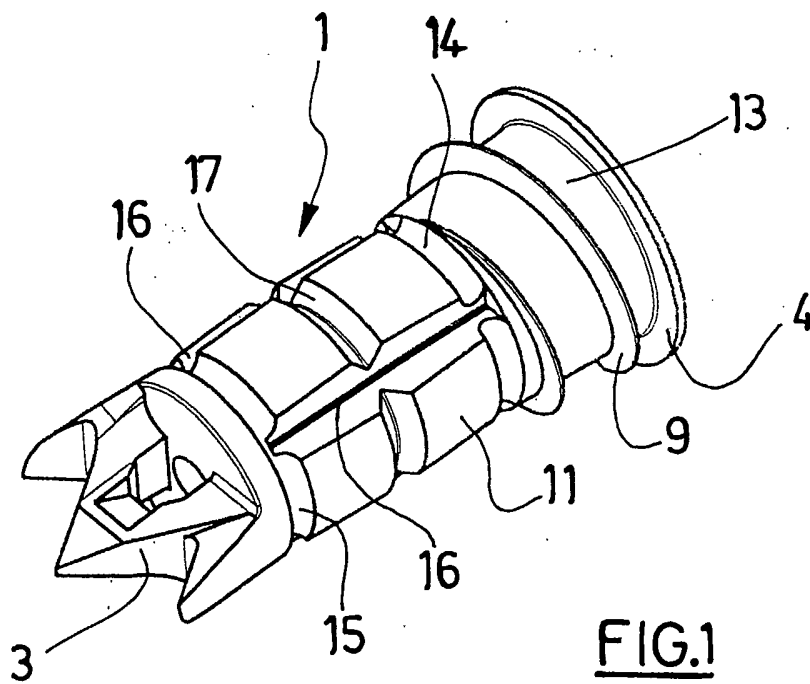
When the screw head bears against the component to be fastened, as the screw is screwed further into the sleeve 12, tensile force is applied to the sleeve, which is driven towards
15 the collar 4, the casing 11 being folded back on to itself about the folding zone 17. As the screw is screwed further in, the two portions 23, 24 of the casing adjacent to the connecting zones 14, 15 move away from the body portion 13 and from the drilling end 3, thereby moving away from the axis 2 in order to form flanges which come to bear against the rear surface 23 of the board 10 at the end of the fastening operation, the bolt in
20 practice being shortened by the axial length of the casing 11.

The bolt may include connecting means designed to connect the portion of the body including the supporting collar 4 and the internal end of the sleeve 12 once the sleeve 12 has been displaced in the external casing 11. If the bolt displays elasticity, an
25 arrangement of this kind prevents the umbrella from opening. Conventional clipping means can be envisaged as the connecting means.

CLAIMS

1. Anchor bolt for friable material, comprising a substantially cylindrical body provided with a bore (22) for receiving a fastener and including an external screw thread (9), with, at one end of the body, a drilling portion (3), at the other end of the body, a supporting collar (4) and, between the drilling end and the supporting collar, an intermediate folding umbrella portion (5), characterised in that the bolt body is telescopic and includes an internal sleeve (12) for receiving the fastener and an external folding umbrella casing (11).
2. Bolt according to claim 1, in which, as the external umbrella casing (11) is adjacent to the drilling end (3), the external screw thread (9) of the bolt body extends between the supporting collar (4) and the umbrella casing (11).
3. Bolt according to one of claims 1 and 2, in which the internal sleeve (12) is designed to be driven in rotation by a driving tool.
4. Bolt according to claim 3, in which the internal end of the sleeve (12) directed towards the supporting collar (4) includes a recess (19) for driving it in rotation.
5. Bolt according to one of claims 2 to 4, in which the pitch of the external screw thread (9) extending between the supporting collar (4) and the external umbrella casing (11) is greater than or equal to substantially half the thickness of the material intended to receive the bolt.
6. Bolt according to one of claims 1 to 5, in which the pitch of the external screw thread (9) extending between the supporting collar (4) and the external umbrella casing (11) is less than or equal to substantially the thickness of the material intended to receive the bolt.
7. Bolt according to one of claims 1 to 6, provided with connecting means designed to connect the portion of the body including the supporting collar (4) and the

internal end of the sleeve (12) once the sleeve (12) has been displaced in the external casing (11).



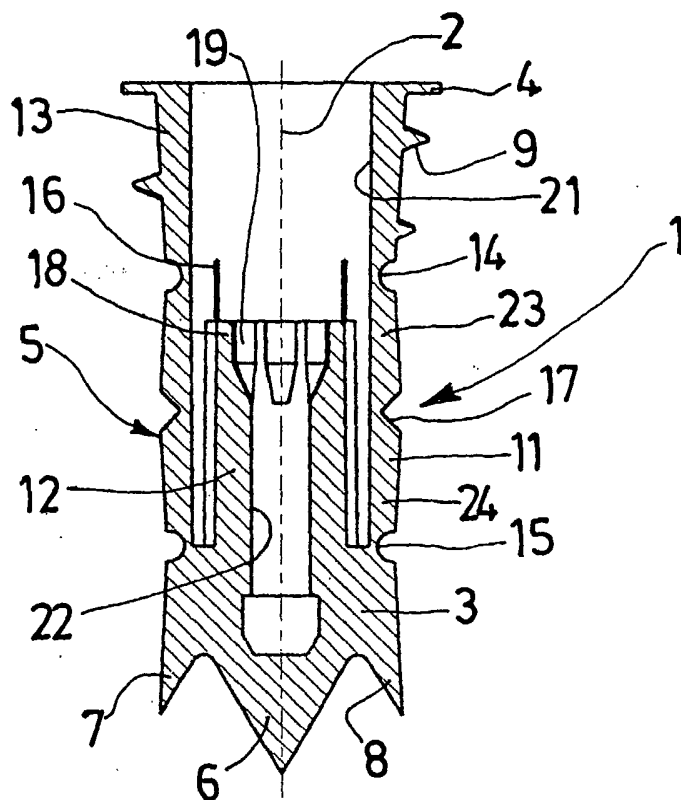


FIG.3

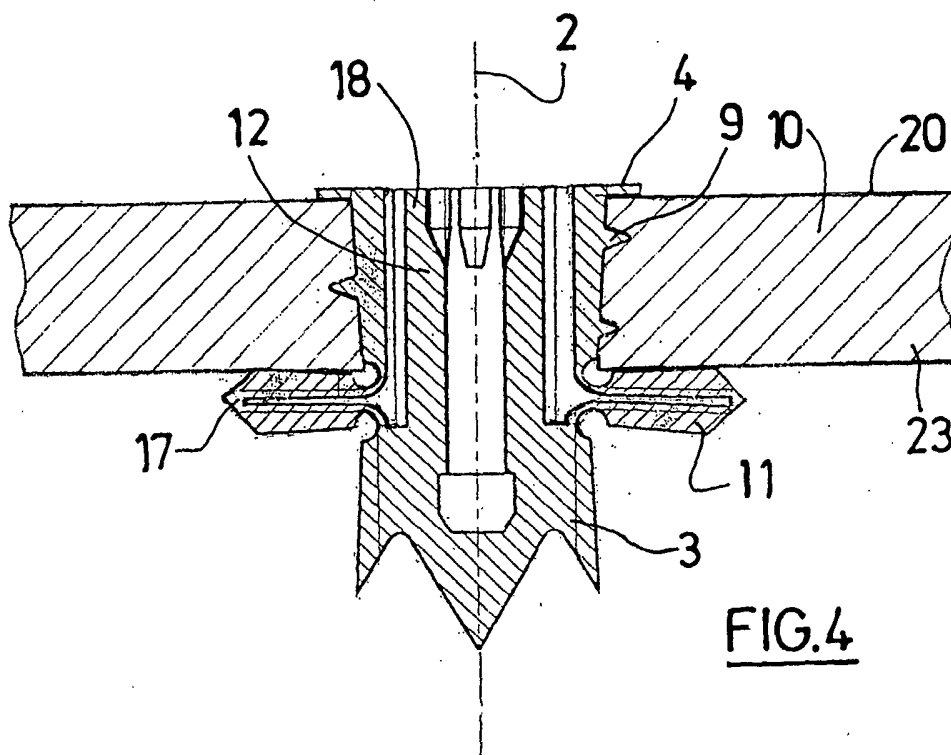


FIG.4