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**Abstract**

A hook connector 10 comprises a base 12 and a hook section 14 extending from the base 12. The base 12 is formed as a wound portion of the wire in a circular pattern with multiple turns. The wound base 12 forms a central aperture 13. The hook section 14 extends from a lower end of the base 12 via a connection portion 16 of the wire which extends outwardly from the base 12. The connection portion 16 laterally spaces the hook section 14 from the base 12 such that the hook section 14 is not engaged by the driving tool socket 102 in use. The hook section 14 is a hook bent outwards and downwardly, and spaced from the lower end of the base 12.

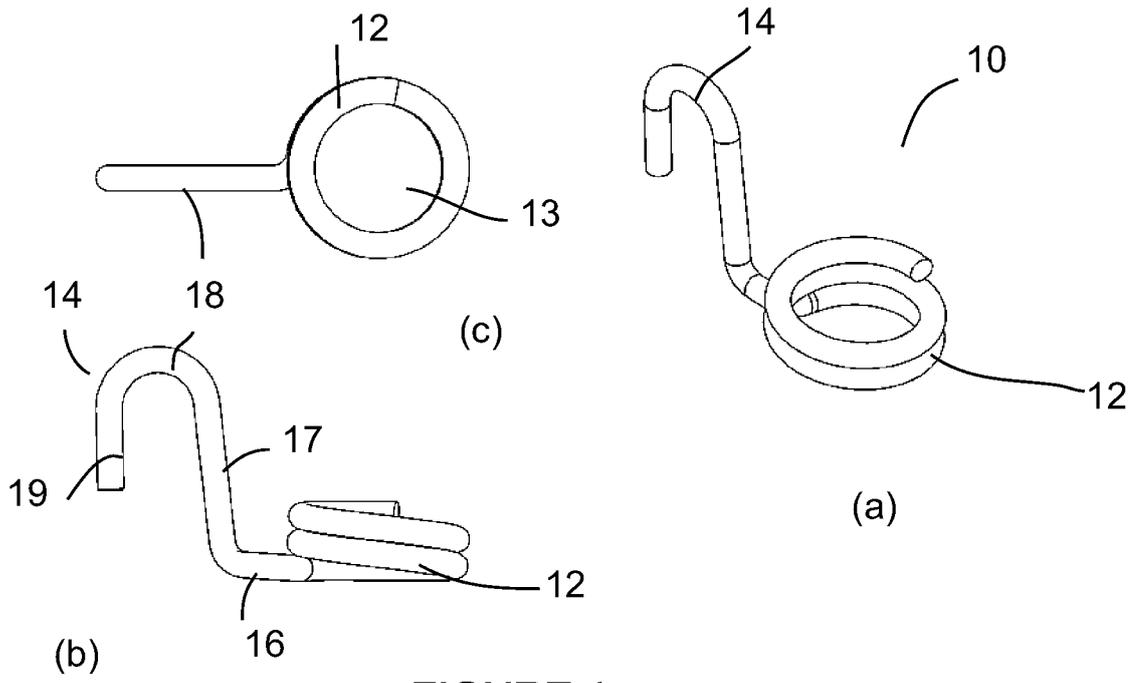


FIGURE 1

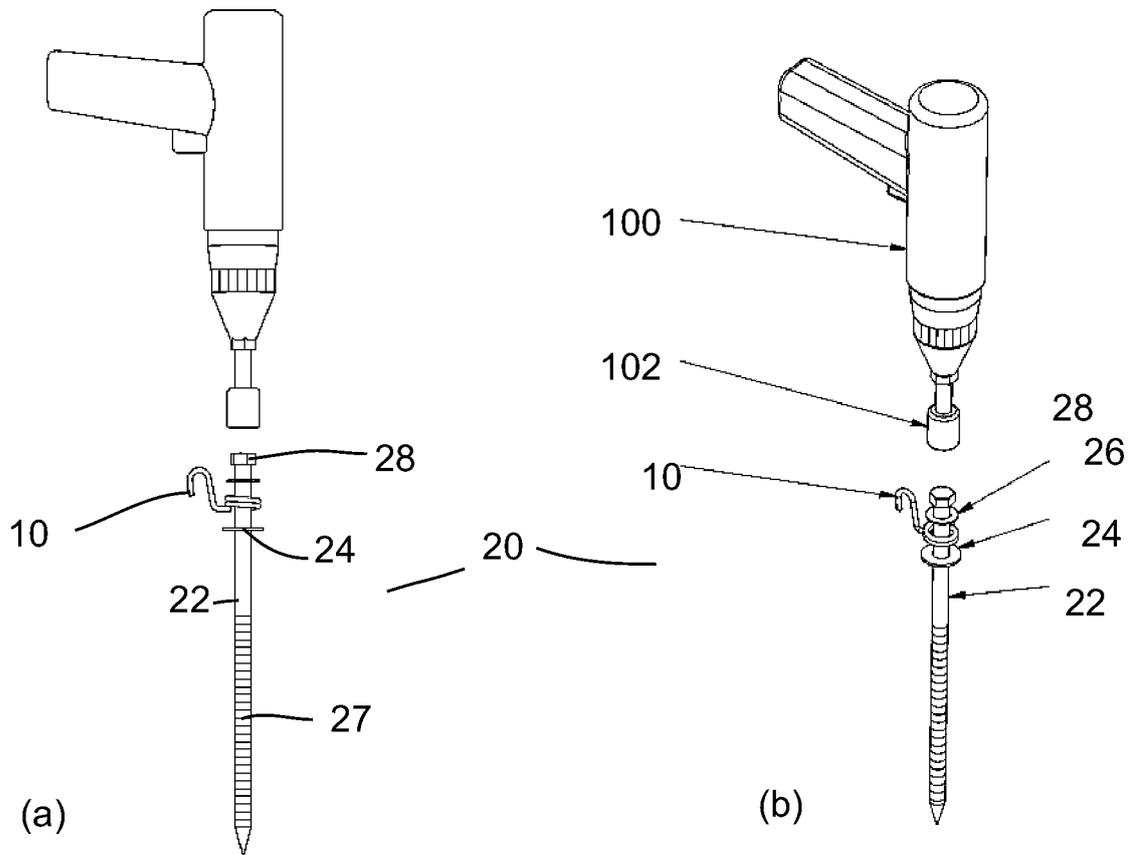


FIGURE 2

## **ANCHOR PEG ASSEMBLY**

### **Field of the Invention**

[1] The present invention relates to an anchor peg assembly for anchoring tents, awnings, annexes, blinds, shades, tents, canvas, plastic sheets, hooks or clips attached to eyelets, and other structures which use ropes or rubber straps to be tied down. The invention is however not limited to this particular use.

### **Background of the Invention**

[2] The present invention seeks to overcome or substantially ameliorate at least some of the deficiencies of the prior art, or to at least provide an alternative.

[3] It is to be understood that, if any prior art information is referred to herein, such reference does not constitute an admission that the information forms part of the common general knowledge in the art, in Australia or any other country.

### **Summary of the Invention**

[4] According to a first aspect, the present invention provides a hook connector for an anchor peg assembly, the hook connector formed from a single length of metal wire and comprising:

a base formed as a wound portion of the wire with multiple turns, the wound base forming a central aperture, and

a hook section extending from a lower end of the base, the hook section being laterally spaced from the base by a connection portion extending horizontally outwardly from the base,

the hook section comprising a first section which extends upwardly from the connection portion at about 45° thereto, a second section which is bent back at about 180° and an end section which extends downwardly and generally parallel to the first section.

[5] In one embodiment, the winds of the base are stacked upon each other.

[6] In another embodiment, the base is formed as a spring coil having spaced winds.

[7] In another embodiment, a distal end of the end section is substantially aligned with the connection portion.

[8] In another embodiment, the hook section comprises a first section which extends upwardly from the connection portion at about 45° thereto.

[9] In another embodiment, the base comprises between 2 to 7 winds.

[10] The present invention also provides an anchor peg assembly comprising

a screw peg having a drive head and a shank with ground engaging means, and at least one hook connector according to any one of the above.

[11] In another embodiment, the anchor peg assembly further comprises a driving tool for driving the screw peg into the ground.

[12] Other aspects of the invention are also disclosed.

### **Brief Description of the Drawings**

[13] Notwithstanding any other forms which may fall within the scope of the present invention, preferred embodiments of the present invention will now be described, by way of examples only, with reference to the accompanying drawings in which:

[14] Figure 1 shows a hook connector for an anchor peg assembly in accordance with a preferred embodiment of the present invention, where (a) is a perspective view, (b) is a side view and (c) is a top view;

[15] Figure 2 shows an anchor peg assembly with the hook connector of Figure 1 in accordance with a preferred embodiment of the present invention and a driving tool, where (a) is a side view and (b) is a perspective view;

[16] Figure 3 shows a hook connector in accordance with another embodiment for the anchor peg assembly, where (a) is a top perspective view, (b) is a bottom perspective view, (c) is a side view, and (d) is a bottom view;

[17] Figure 4 shows an anchor peg assembly with the hook connector of Figure 3 in accordance with a preferred embodiment of the present invention and a driving tool, where (a) is a side view and (b) is a perspective view;

[18] Figure 5 schematically shows the anchor peg assembly of Figure 4 in one use thereof;

[19] Figure 6 schematically shows the anchor peg assembly of Figure 4 in another use thereof;

[20] Figure 7 schematically shows the usable ground mount angles of the anchor peg assembly of Figure 4;

[21] Figure 8 shows (a) an anchor peg assembly in accordance with another embodiment having the hook connector of Figure 1 and a different screw peg, (b) shows an enlarged view of the screw peg head and (c) shows an enlarged view of the screw peg engaging section, and

[22] Figure 9 is similar to Figure 7 and shows another modified embodiment of a hook connector.

### Description of Embodiments

[23] It should be noted in the following description that like or the same reference numerals in different embodiments denote the same or similar features.

[24] Figure 1 shows a hook connector 10 for an anchor peg assembly 20 in accordance with a preferred embodiment of the present invention. The hook connector 10 is formed as a metal clip from a single length of thick gauge metal wire.

[25] The hook connector 10 comprises a base 12 and a hook section 14 extending from the base 12. The base 12 is formed as a wound portion of the wire in a circular pattern with multiple turns, in the embodiment being between 2 to 3 turns. The wound base 12 forms a central aperture 13. The winds of the wire are stacked upon each other, but in possible modifications can also be formed as a spring coil having spaced winds.

[26] The hook section 14 extends from a lower end of the base 12 via a connection portion 16 of the wire which extends outwardly from the base 12. The connection portion 16 laterally spaces the hook section 14 from the base 12 such that the hook section 14 is not engaged by the driving tool socket 102 in use as described further below. The hook section 14 comprises a first section 17 which extends upwardly from the connection portion 16 at about 90° thereto, a second section 18 which is bent back at about 180° and an end section 19 which extends downwardly and is close to parallel to the first section 17.

[27] The first section 17 extends to a height about 2 to 3 times the height of the base 12, with the end section 18 finishing at a height similar to the height of the base 12 and thus spaced from the lower end of the base 12 (and thus the ground in use). The hook section 14 is thus a hook bent outwards and downwardly, and spaced from the lower end of the base 12.

[28] Figure 2 shows the anchor peg assembly 20 which comprises a screw peg 22, and stacked inserted into the screw peg 22, a lower large washer 24, the hook connector 10, and an upper small washer 26. The screw peg 22 comprises a shank having a lower ground engaging section 27 (threaded) and top drive head 28. The screw peg 22 extends through the central aperture 13 of the base 12. The lower washer 24 can however be omitted. Also, the assembly can include two upper washers 26.

[29] The drive head 28 can be a hexagon to square head and will retain the hook connector 10 in use with the upper washer 26 between the head 28 and the hook connector 10. Figure 2 also shows the driving tool 100 which has a socket 102, preferably magnetic, for receiving and driving the drive head 28.

[30] Figure 3 shows a hook connector 10b in accordance with another embodiment which is similarly formed as the hook connector 10 above. The hook connector 10b is also formed as a metal clip from a single length of thick gauge metal wire and comprises the base 12 and

the hook section 14 extending laterally spaced from the lower end of the base 12 via the connection portion 16. The base 12 in this embodiment has between 5 to 7 turns. The hook section 14 is similarly formed as a hook bent outwards and downwardly, and extending from the lower end of the base 12, finishing spaced from the lower end of the base 12.

[31] Figure 4 shows an anchor peg assembly 20b which also comprises a screw peg 22, and stacked inserted into the screw peg 22, the hook connector 10b and an upper washer 26. The screw peg 22 similarly comprises a (threaded) lower ground engaging section 27 and top drive head 28 which is engageable by the driving tool socket 102.

[32] Figure 5 schematically shows one use of the anchor peg assembly 20b (or anchor peg assembly 20). In this use, the hook section 14 of the hook connector 10b engages a metal ring 112 of a tent, annex or other sheet structure 110. The screw peg 22 is typically driven into the ground 120 via the drive tool 100 to an initial nominal depth such as halfway, with the metal ring then engaged to the hook section 14 before driving the screw peg 22 further into the ground 120. This will tension the sheet structure 110 and retain it anchored to the ground 120.

[33] The screw peg 22 is driven into the ground 120 until the desired tension in the sheet structure 110 is achieved, or it can be driven substantially fully into the ground until the base 12 of the hook connector 10b engages the ground. The central aperture 13 allows the screw peg 22 to be rotatably driven by the driving tool 100 into the ground with the hook connector 10 not rotating and remaining engaged to the ring 112. The head 28 of the screw peg 22 is typically spaced from the ground 120 in use which provides the hook connector 10 with travel along the screw peg 22. If the base 12 is formed as a spring coil, the base 12 can then also provide a resilient tensioning means.

[34] Figure 6 schematically shows another use of the anchor peg assembly 20b (or anchor peg assembly 20). In this use, the hook section 14 of the hook connector 10 engages a guy rope 114 of a tent, annex or other structure. The screw peg 22 in this case can be fully driven into the ground 120 first via the drive tool 100, with the guy rope 114 then engaged to the hook section 14. This will tension the structure 110 and retain it anchored to the ground 120.

[35] Figure 7 schematically shows the usable ground mount angles of the anchor peg assembly 20b (or 20). The screw peg 22 can be mounted to the ground from vertical orientation to an angle of about 45° at which the hook section 14 will retain engagement with the connector 114 of the structure. In another possible modification, the end section 19 of the hook section 14 can be bent back further into the first section 17 to assist with security and retention of structure connectors. The hook connector 10 will rotate about the screw peg 22

to the direction of the tension and thus the user does not have to maintain the hook connector 10 in any specific direction during installation or use.

[36] Figure 8 shows an anchor peg assembly 20c in accordance with another embodiment having the hook connector of Figure 1 and a different screw peg 22b. The screw peg 22b in this embodiment has a hex or Allen key drive head 28. Other alternatives are also possible, such as a square drive head or other type of internal recess drive including tamperproof recesses.

[37] Figure 9 is similar to Figure 7 but shows another modified embodiment of a hook connector 10c. In this embodiment, the hook portion 14 is at an acute angle away from and relative to the base 12. The first section 17 extends upwardly from the connection portion 16 at about 45° thereto. This acute angle orientation allows the hook portion 14 to be substantially aligned with the guy rope 114 in the vertical orientation of the screw peg 22, as well as increasing retention security in an acute angle of up to 45° of the screw peg 22.

[38] The present invention thus provides an anchor peg assembly which provides substantial advantages to conventional anchoring pegs, such as ease of installation and improved retention security. These advantages are of particular importance as driving conventional anchor pegs into the ground can be difficult due to ground hardness as well as security of the retention not being assured.

[39] The screw pegs 22 can also be used by themselves without the clip hook 10 to insert through eyelets of a sheet structure to anchor them down.

[40] Whilst preferred embodiments of the present invention have been described, it will be apparent to skilled persons that modifications can be made to the embodiments described.

[41] For example, In a further possible modification, the hook section 14 can include a resilient retaining bar which extends across from the first section 17 to the end section 19 to assist with security and retention of structure connectors during installation and use.

[42] In another possible modification, the anchor peg assembly can include two or more hook connectors extending in different directions.

[43] Most other prior art anchor clips are plastic and don't last very long, either struck accidentally with a hammer or other tools, and are also affected by solar degradation. The present embodiments provide a metal anchor peg and clip which overcomes these disadvantages.

**Claims**

The claims defining the invention are as follows:

1. A hook connector for an anchor peg assembly, the hook connector formed from a single length of metal wire and comprising:
  - a base formed as a wound portion of the wire with multiple turns, the wound base forming a central aperture, and
  - a hook section extending from a lower end of the base, the hook section being laterally spaced from the base by a connection portion extending horizontally outwardly from the base,
  - the hook section comprising a first section which extends upwardly from the connection portion at about 45° thereto, a second section which is bent back at about 180° and an end section which extends downwardly and generally parallel to the first section.
2. The hook connector of claim 1 wherein the winds of the base are stacked upon each other.
3. The hook connector of claim 1 wherein the base is formed as a spring coil having spaced winds.
4. The hook connector of claim 1 wherein a distal end of the end section is substantially aligned with the connection portion.
5. The hook connector of claim 1 wherein the base comprises between 2 to 7 winds.
6. An anchor peg assembly comprising
  - a screw peg having a drive head and a shank with ground engaging means, and
  - at least one hook connector according to any one of claims 1 to 4.
7. The anchor peg assembly of claim 6 further comprising a driving tool for driving the screw peg into the ground.

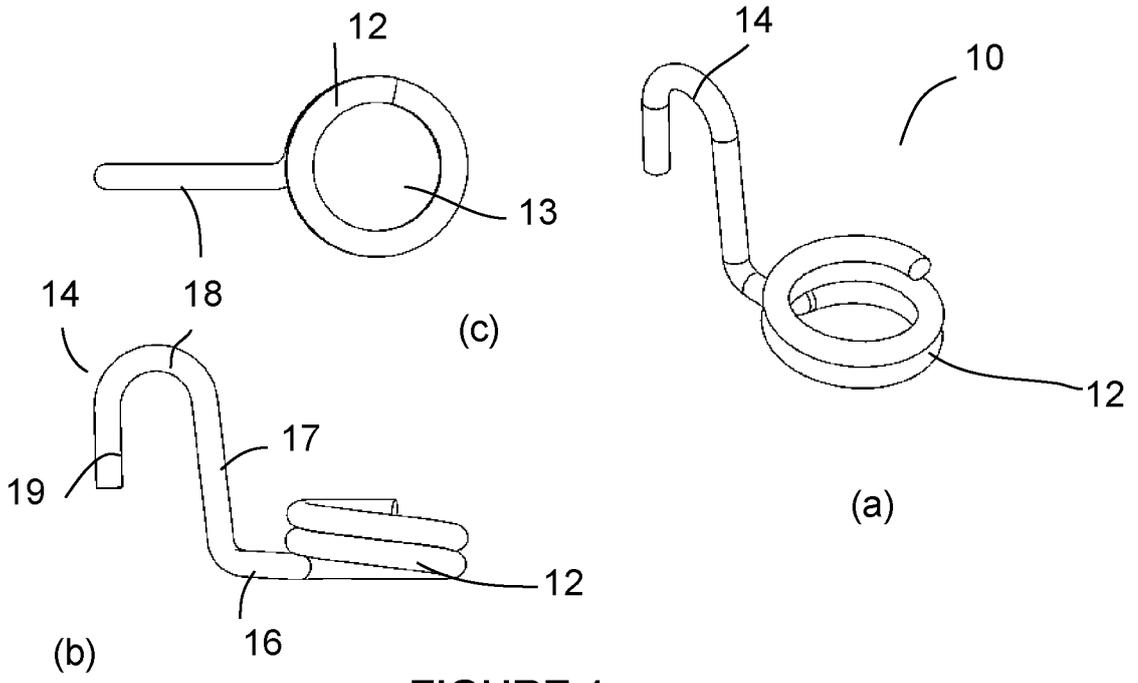


FIGURE 1

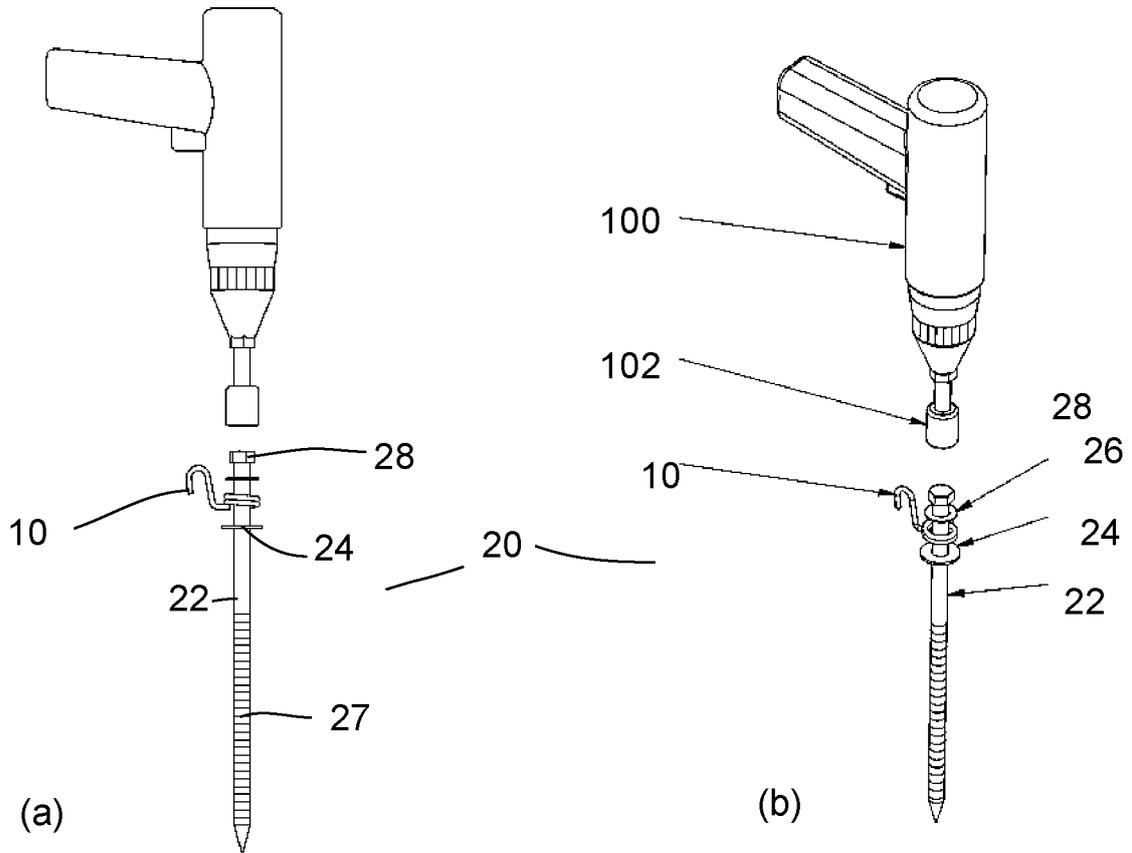


FIGURE 2

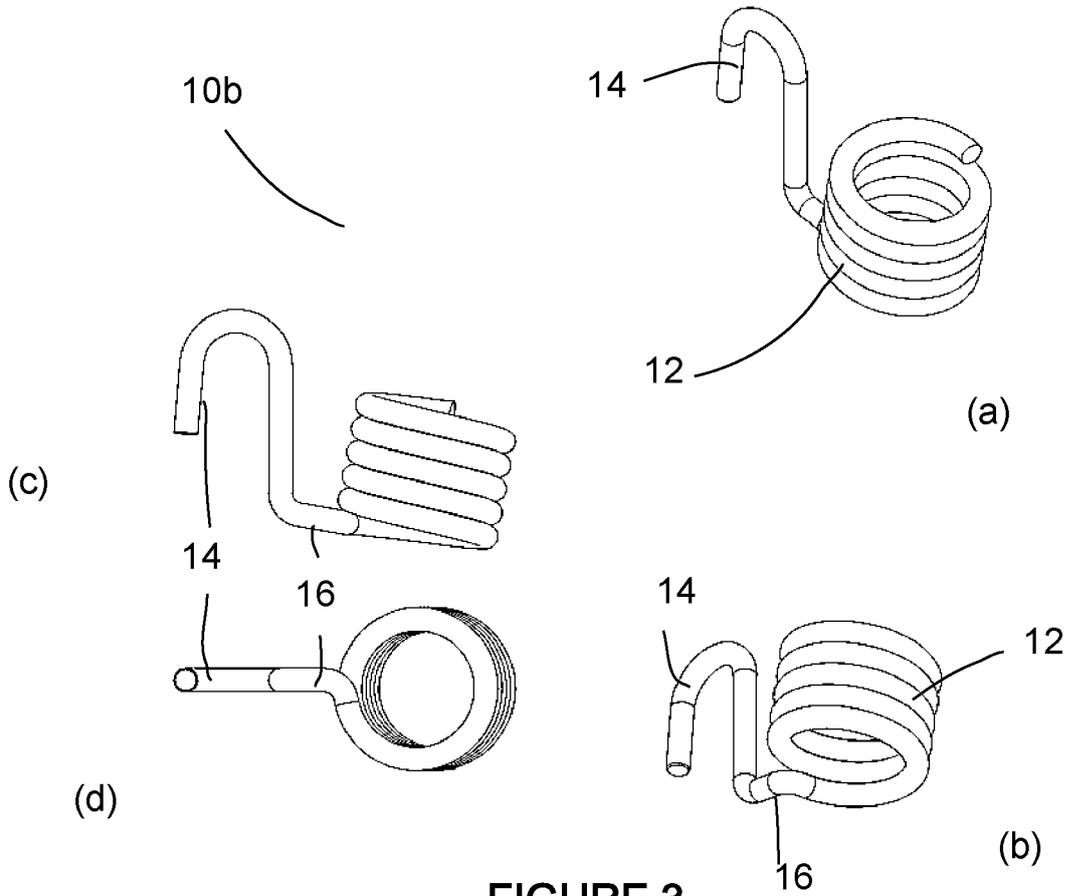


FIGURE 3

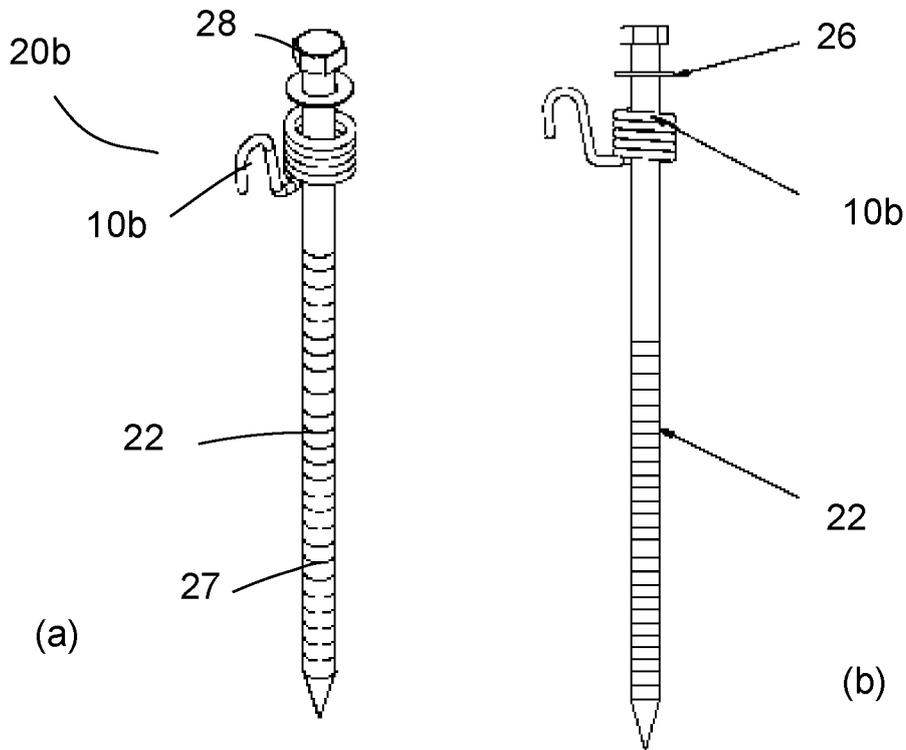


FIGURE 4

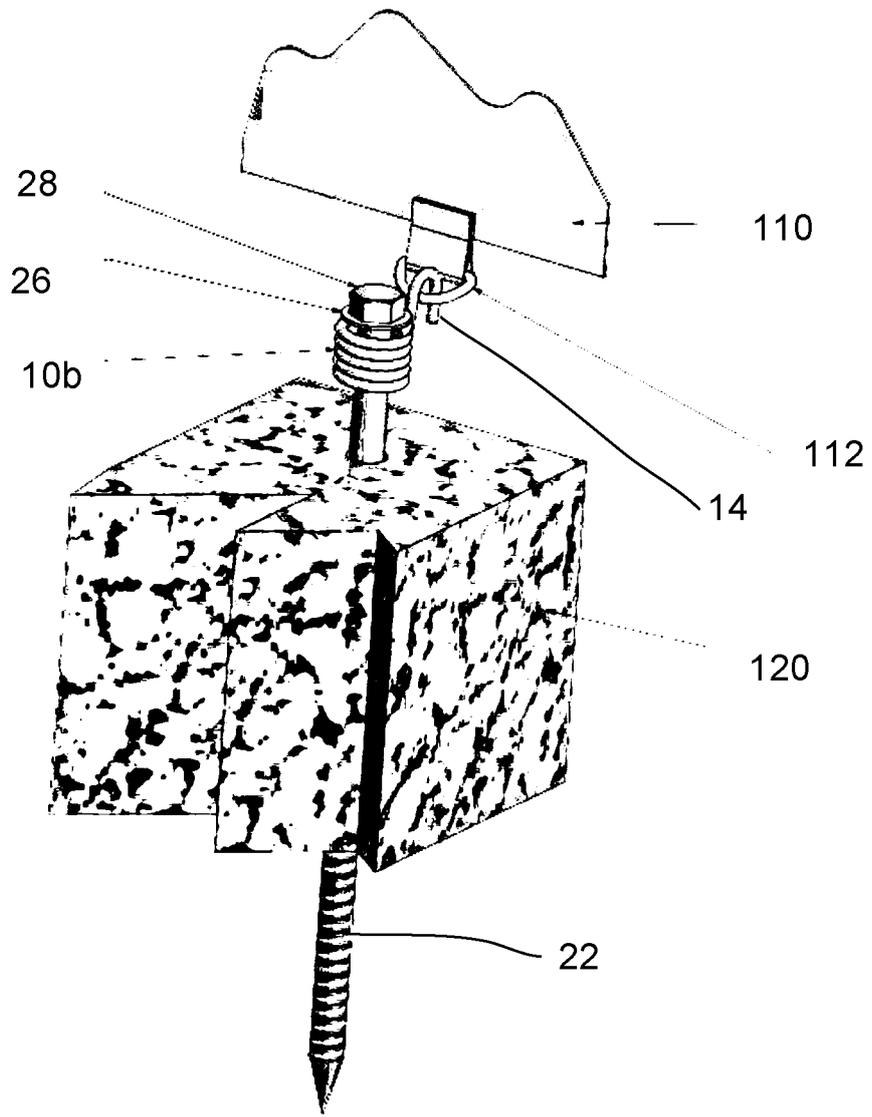


FIGURE 5

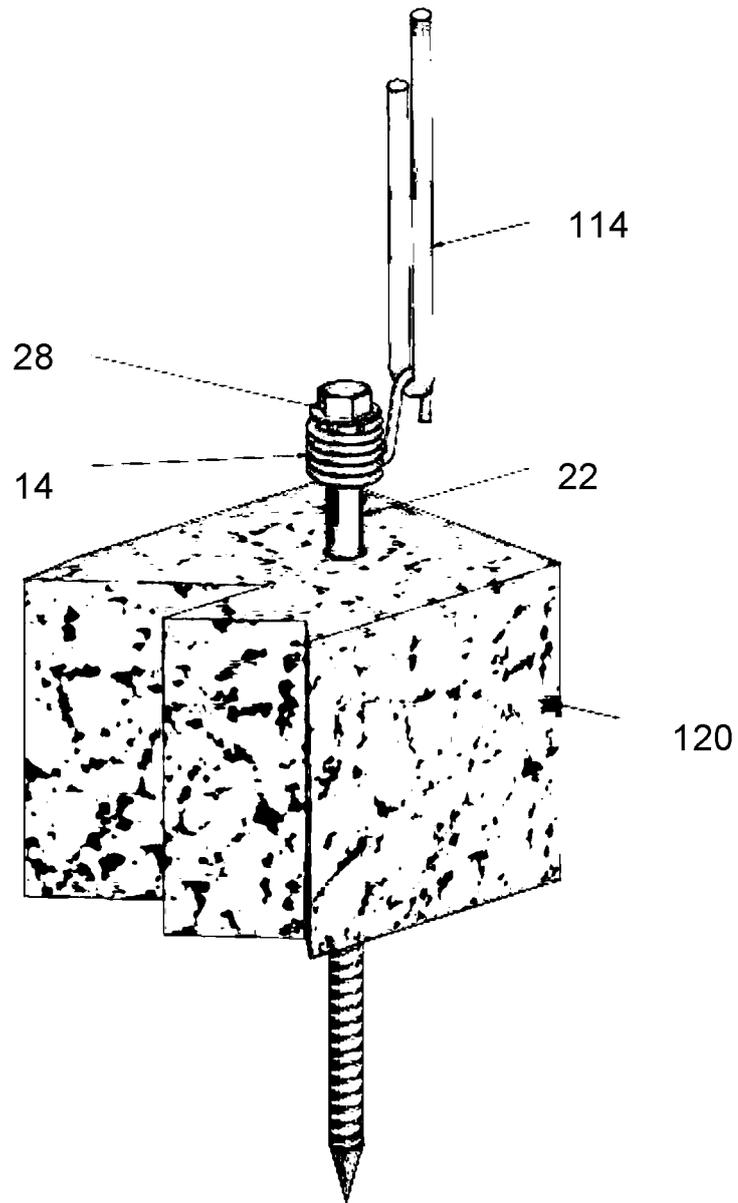


FIGURE 6

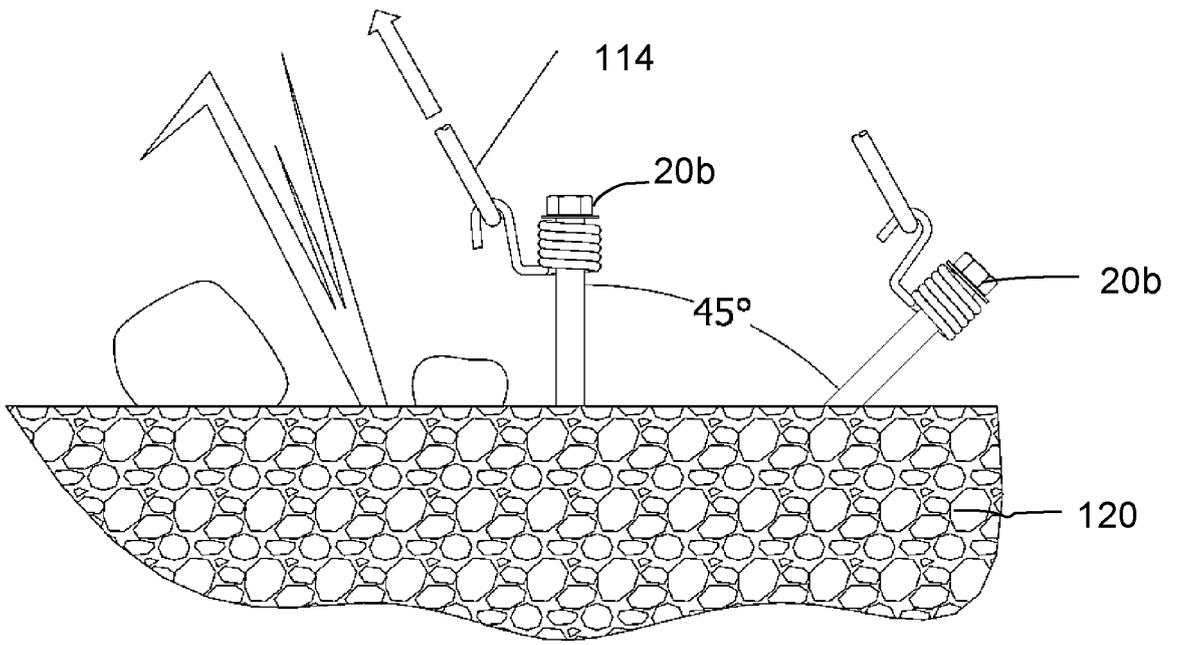
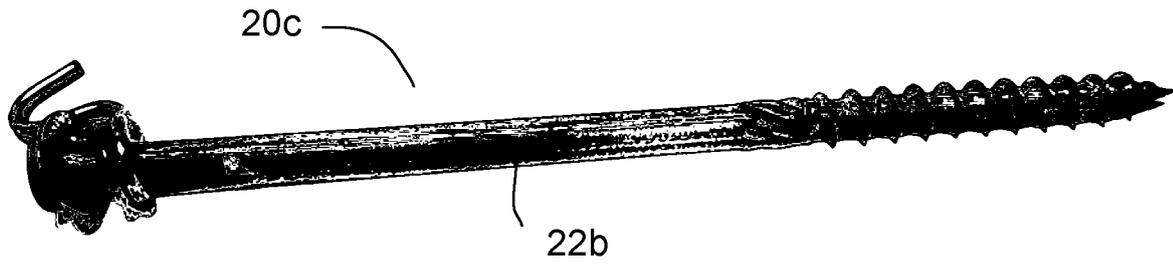


FIGURE 7



(a)



(b)



(c)

FIGURE 8

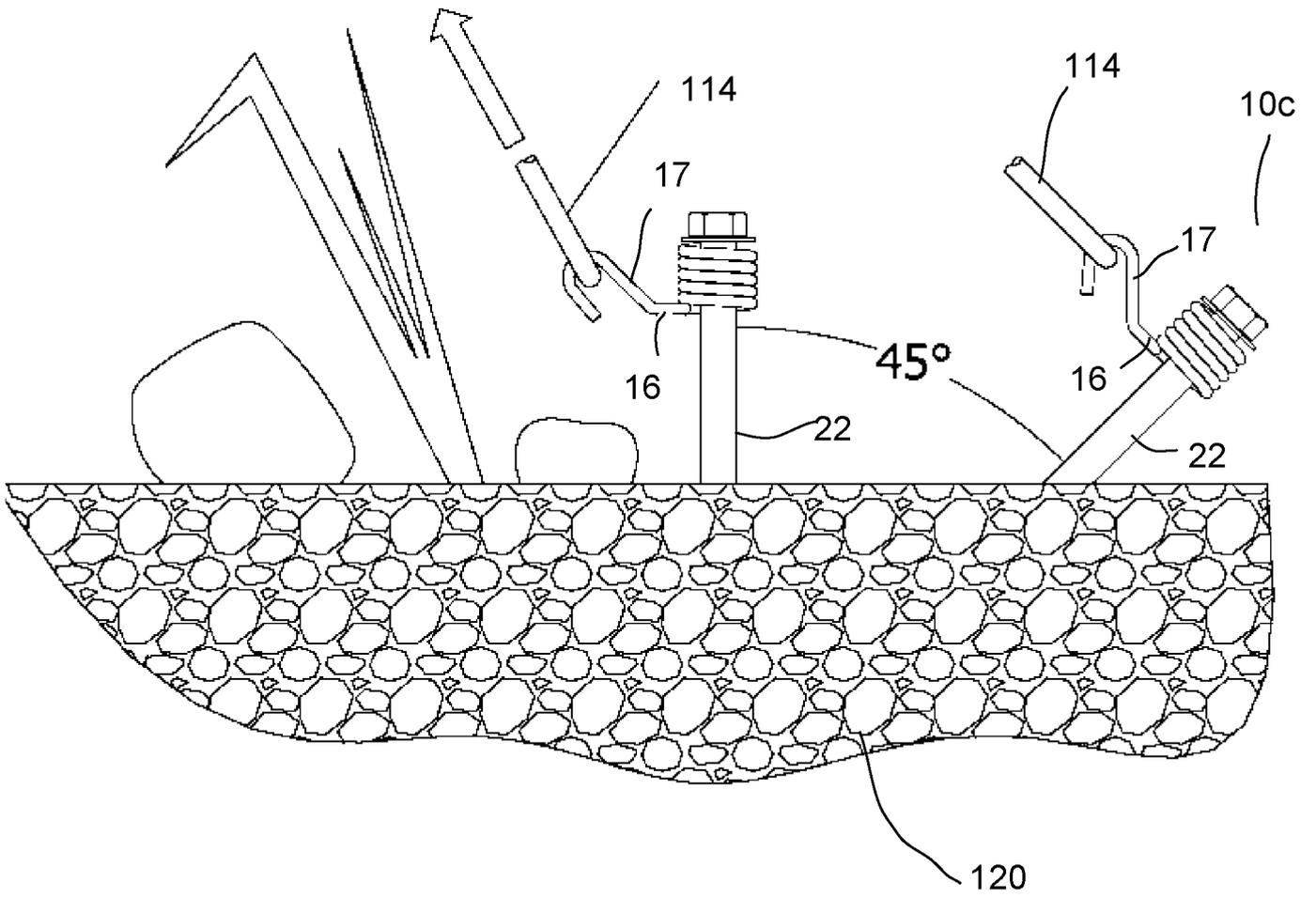


FIGURE 9