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(54) **SEISMIC TOOL ASSEMBLY FOR USE IN ANCHOR INSERTION**

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(57) **ABSTRACT**

A seismic tool assembly for effecting a drill hole and enlarging a lowermost end thereof whereby an anchor can be set more securely therein. A drill bit is inserted through an opening in a cap portion, which is mounted on a stabilizer mounted within at least a portion of the drill hole. The bit is then inserted through each of the cap portion and the stabilizer to attain a drilling position. The bit possesses extra cutting tips on an upper end thereof, with a view to widening the upper end of a drill hole so that a wider flange can be inserted therein, so as to further stabilize and support the stabilizer when limited tilting movement of the bit within the stabilizer is performed during the drilling process.

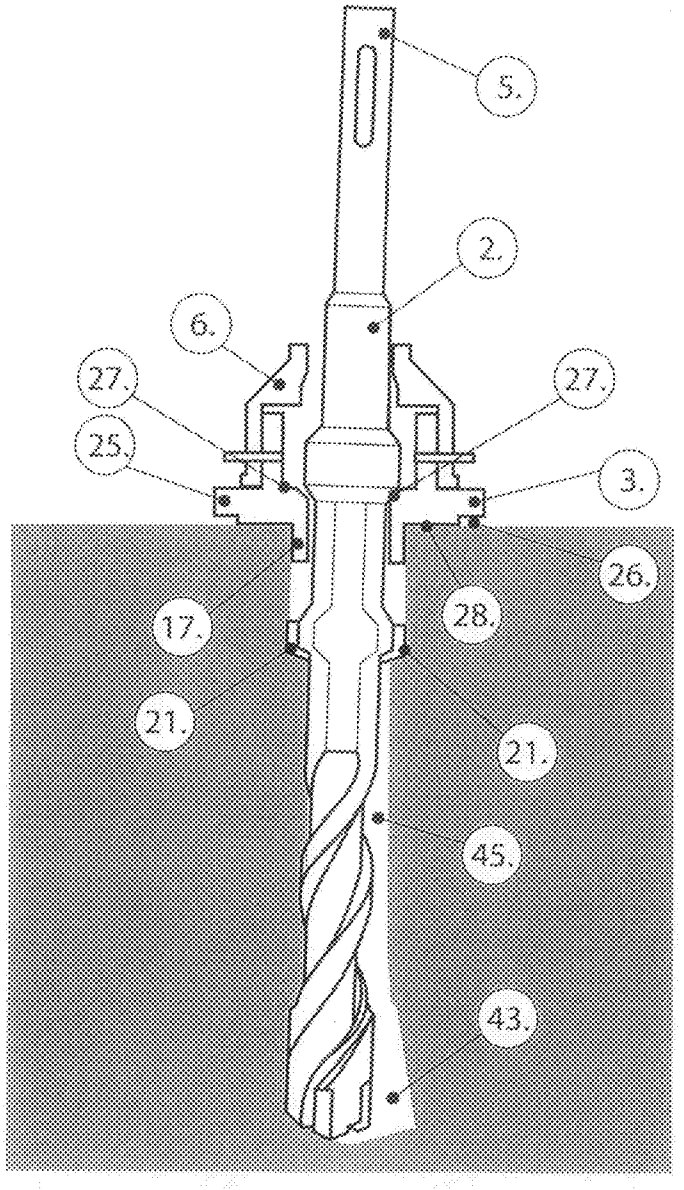


Figure 1

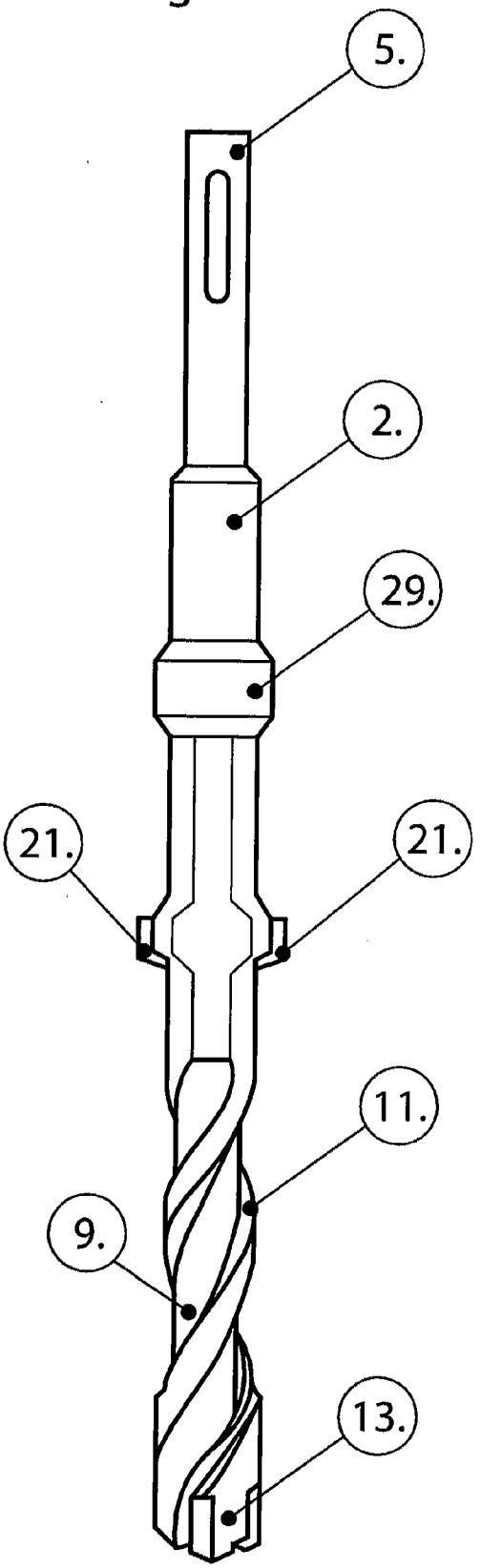


Figure 2

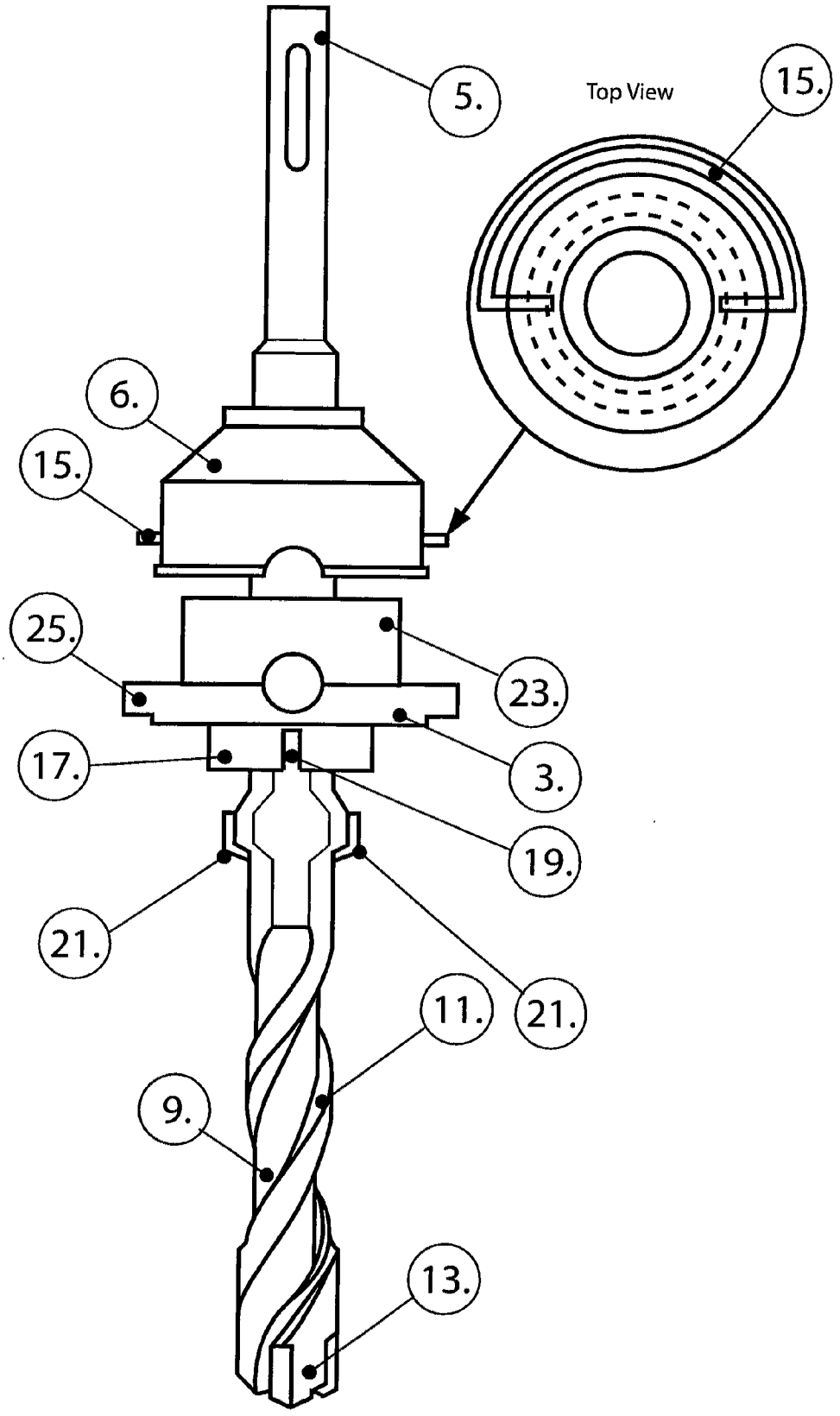


Figure 3

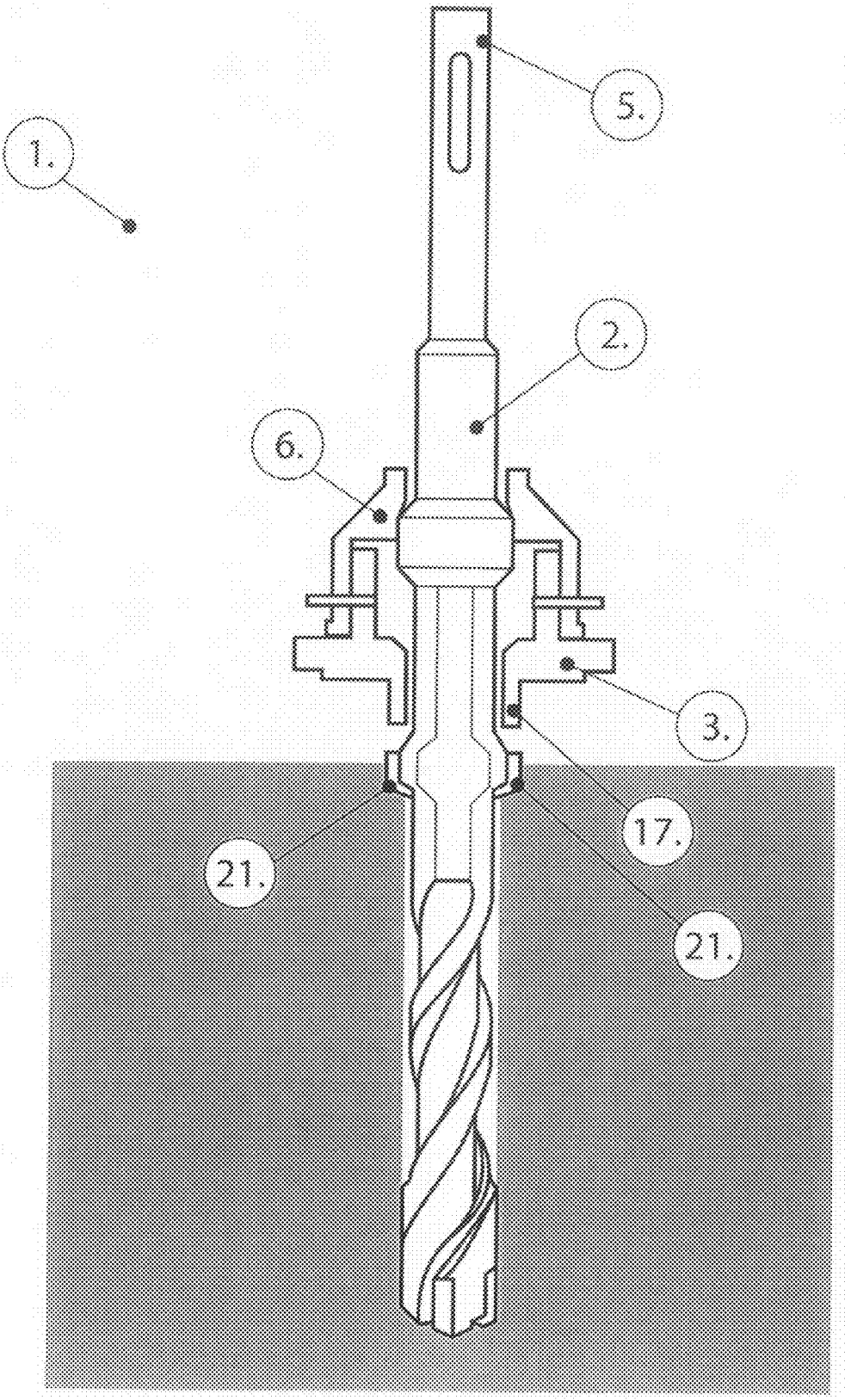


Figure 4

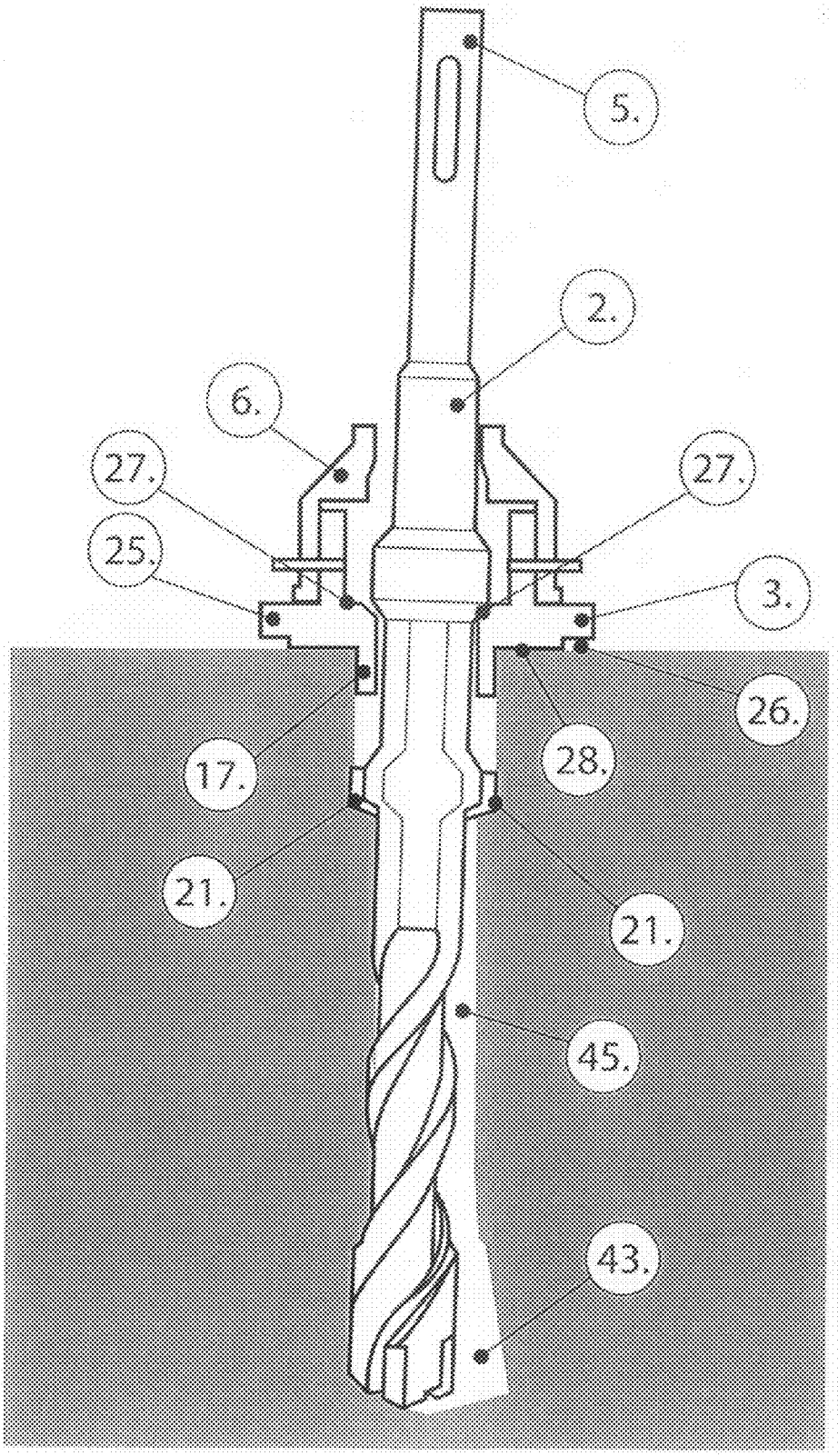
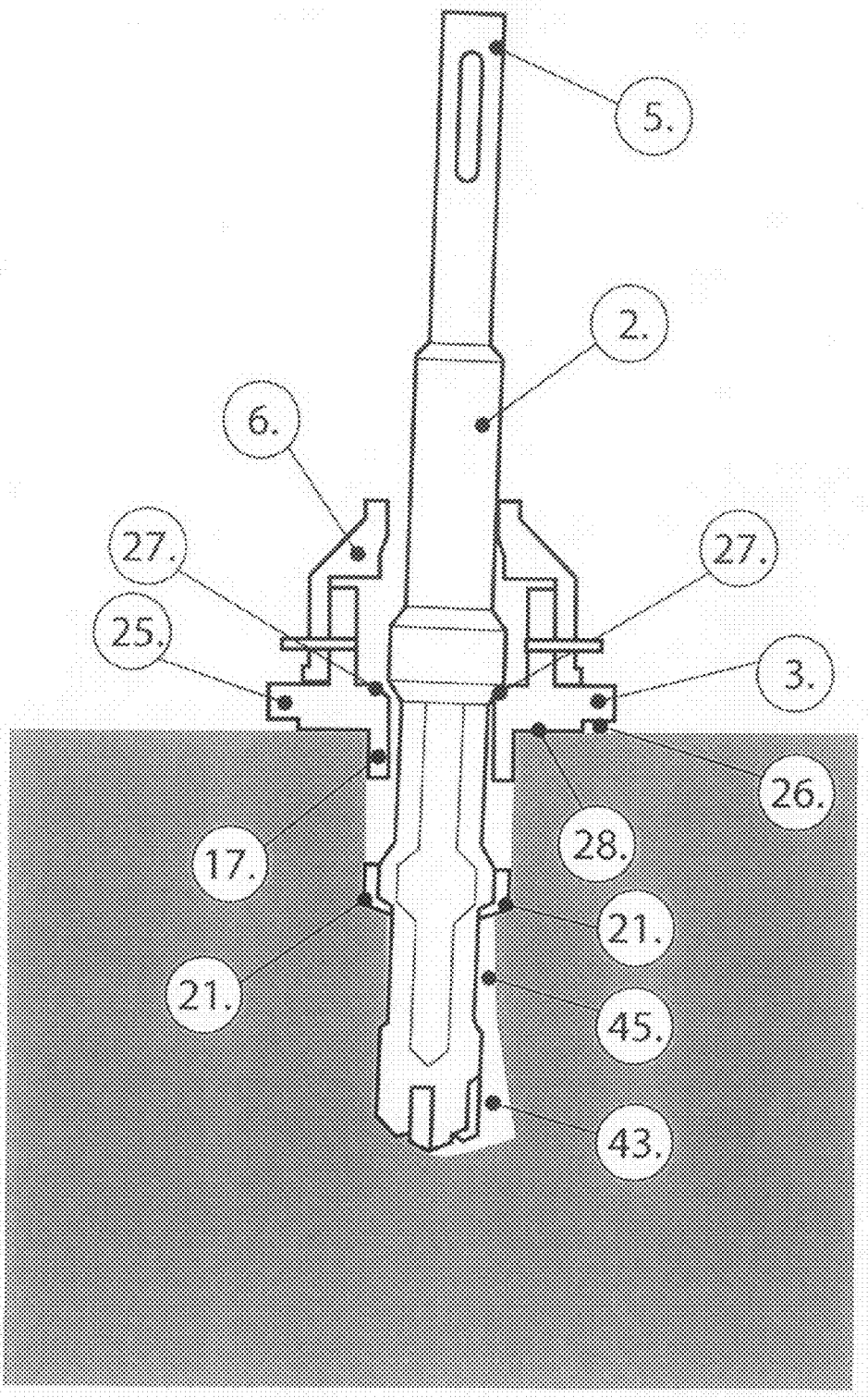


Figure 5



SEISMIC TOOL ASSEMBLY FOR USE IN ANCHOR INSERTION

[0001] The present invention relates to a seismic tool assembly meant to be used for the later insertion and setting of anchors, such as drop-in and wedge type anchors into brittle materials such as concrete, stone, masonry and cementuous materials. More particularly, the present invention relates to a seismic tool assembly for effecting a drill hole and enlarging a lowermost end thereof to have a greater circumference than that of the remainder of the drill hole whereby an anchor can be set more securely therein.

BACKGROUND OF THE INVENTION

[0002] Anchors are conventionally used in construction to attach various components of a building construction to an overhead ceiling or other structure. Such components to be attached can relate to, for example, services that provide plumbing, electrical, drainage, sprinkler system piping and drop ceilings. From these anchors, which are usually of the wedge or drop-in type variety, all of the above services and ceilings are suspended or secured.

[0003] Conventionally, in setting anchors in concrete to suspend an awning, for example, a hole is pre-drilled in the surface to which the anchor is to be applied, and then the anchor is inserted into the pre-drilled hole. However, when setting such anchors in concrete it is not uncommon for such anchors to weaken and loosen over time, particularly in situations where cracking or chipping of the concrete around the pre-drilled hole has occurred.

[0004] Furthermore, studies have revealed that cracking can typically occur in the concrete element, and that such cracks can significantly impact the performance of anchors. Cracks can originate on a concrete beam or slab in a variety of ways, such as creep, temperature settlement of the support or foundation, thermal expansion and contraction stress overload, or from a natural disaster such as an earthquake or flood. In such situations, the situation can arise where, if one such concrete anchor fails and lets go, the remaining anchors, by virtue of the weight they additionally assume in light of such failure, can also similarly collapse and fail.

[0005] It has been found that enlarging the lowermost (interior) portion of a drill hole can allow an anchor to be set more securely therein. It has further been found that providing a drill hole with an enlarged lower end having a greater circumference than that of the remainder of the drill hole can be advantageously provided by a drill bit having an enlarged cutting portion adjacent the tip, which is inserted into the drill hole, whereby the enlargement of the cutting portion is configured so that it can pass through the shaft of the pre-drilled hole to be enlarged.

[0006] It would therefore be advantageous to have an improved seismic tool assembly meant to be used for the later insertion and setting of anchors into brittle materials such as concrete, stone, masonry and cementuous materials.

[0007] It would be further advantageous to have an improved seismic tool assembly for use in a one step process for both creating a drill hole and, at the same time, enlarging a lowermost end of a drill hole, wherein the lowermost end of the drill hole can be further drilled and enlarged to have a greater circumference than that of the remainder of the drill hole, wherein an anchor can later be positioned and securely retained within the enlarged area.

[0008] It would also be further advantageous to have an improved seismic tool assembly meant to be used for the later insertion and setting of anchors which utilizes a stabilizer having an opening corresponding with the drill hole for receiving an insertion of the bit body into the drill hole, so as to aid in accurately inserting the drill bit into the drill hole. It would also be still further advantageous to have a bit body which possesses extra cutting tips on an upper end thereof, with a view to widening the upper end of a drill hole so that a wider flange can be inserted therein, so as to further stabilize and support the stabilizer when limited tilting movement of the bit within the stabilizer is performed during the drilling process. To this end, the present invention effectively addresses this need.

SUMMARY OF THE INVENTION

[0009] The present invention provides an improved seismic tool assembly meant to be used for the later insertion and setting of anchors for the insertion and setting of anchors into brittle materials such as concrete, stone, masonry and cementuous materials.

[0010] The present invention also provides an improved seismic tool assembly meant to be used for the later insertion and setting of anchors, which can be used in a one step process for both creating a drill hole and, at the same time, for enlarging a lowermost end of a drill hole to have a greater circumference than that of the remainder of the drill hole, whereby an anchor can be later set and positioned more securely therein.

[0011] The present invention also provides an improved seismic tool assembly meant to be used for the later insertion and setting of anchors which utilizes a stabilizer having an opening corresponding with the drill hole for receiving an insertion of the bit body into the drill hole, so as to aid in accurately inserting the drill bit into the drill hole.

[0012] The present invention also provides an improved seismic tool assembly meant to be used for the later insertion and setting of anchors which utilizes a stabilizer which possesses a lower end having a larger sized opening greater than that of the bit body, so as to increase the range of motion of the drilling bit and permit limited tilting movement of the bit within the stabilizer during the drilling process so as to further aid in enlarging a lowermost end of the drill hole to receive an anchor. The present invention also provides an improved seismic tool assembly wherein a drill stop member permits a tilted controlled rotation within the stabilizer.

[0013] The present invention also provides an improved seismic tool assembly meant to be used for the later insertion and setting of anchors which utilizes a bit body which possesses extra cutting tips on an upper end thereof, with a view to widening the upper end of a drill hole so that a wider flange, having a greater structural strength wall, can be inserted therein, so as to further stabilize and support the stabilizer when limited tilting movement of the bit within the stabilizer is performed during the drilling process.

[0014] According to a first broad aspect of an embodiment of the present invention, there is disclosed a seismic tool assembly for effecting a drill hole and enlarging a lowermost end thereof for a later insertion and setting of anchors therein, the assembly comprising a substantially cylindrical bit body sized to fit into the drill hole, the bit body having a first end region constructed and arranged to be operatively connected to a drill and a second end region disposed generally opposite said first end region, wherein a quad cutting portion is positioned to protrude from the second end region and an upper

cutting portion positioned on a substantially middle portion thereof, the quad cutting portion and the upper cutting portion each having an operational cutting radius greater than a cutting radius of the bit body; a stabilizer for mounting within at least a portion of the drill hole and having a recessed interior portion, the stabilizer further comprising:

a flange portion constructed and arranged to extend into the drill hole and abut an inside portion thereof; a central opening, the central opening providing a space between the bit body and the flange portion to permit limited tilting movement of the bit body during a drilling process to enlarge the lowermost end of the drill hole; a support portion integrally mounted on the flange portion; an upper portion integrally mounted on the support portion, the support portion having an outermost diameter greater than that of the upper portion; a cap portion having an opening defined therethrough corresponding with the stabilizer and for receiving an insertion of the bit body therethrough, the cap portion being constructed and arranged to cover and be positioned to surround the upper portion of the stabilizer.

[0015] According to another broad aspect of an embodiment of the present invention, there is disclosed a seismic tool assembly for effecting a drill hole and enlarging a lowermost end thereof for a later insertion and setting of anchors therein, the assembly comprising a substantially cylindrical bit body sized to fit into the drill hole, the bit body having a first end region constructed and arranged to be operatively connected to a drill and a second end region disposed generally opposite said first end region, wherein a quad cutting portion is positioned to protrude from the second end region and an upper cutting portion positioned on a substantially middle portion thereof, the quad cutting portion and the upper cutting portion each having an operational cutting radius greater than a cutting radius of the bit body, and wherein the bit body further comprises an abutment member formed thereon having a greater width than a remainder of the bit body; a stabilizer for mounting within at least a portion of the drill hole and having a recessed interior portion, the stabilizer further comprising:

a flange portion constructed and arranged to extend into the drill hole and abut an inside portion thereof; a central opening, the central opening providing a space between the bit body and the flange portion to permit limited tilting movement of the bit body during a drilling process to enlarge the lowermost end of the drill hole; a support portion integrally mounted on the flange portion, an outermost end of the support portion further comprising a recessed portion on a bottom surface thereof, the recessed portion being constructed and arranged to provide a gap between the support portion and a surface to be drilled; an upper portion integrally mounted on the support portion, the support portion having an outermost diameter greater than that of the upper portion; and a recessed shoulder portion on an interior thereof which is constructed and arranged to contact the abutment member when the bit body is inserted therethrough, thus restricting downward movement of the bit body to a pre-set depth, and wherein the recessed shoulder portion permits a tilted controlled rotation of the bit body within the stabilizer; a cap portion having an opening defined therethrough corresponding with the stabilizer and for receiving an insertion of the bit body therethrough, the cap portion being constructed and arranged to cover and be positioned to surround the upper portion of the stabilizer; locking means positioned substantially around the cap portion for selectively stabilizing the bit body and for preventing disassembly of the bit body from the cap portion and the stabilizer, wherein the locking means are spring loaded and further comprise a pair of engagement members positioned on each side of the cap portion whereby, when depressed simultaneously, the pair of engagement members are movable to permit placement of the cap portion on the stabilizer and, once depression of the locking means ceases, the pair of engagement members engage an outer surface of the upper portion of the stabilizer, restricting disengagement of the cap portion from the upper portion of the stabilizer.

[0016] An important advantage of the present invention is that it provides an improved seismic tool assembly having a drill bit which can be connected to a conventional drill, for effecting a drill hole and enlarging a lowermost end thereof wherein an anchor can later be positioned and securely retained within the enlarged area. Further, the present invention provides a stabilizer having a flange portion for mounting within at least a portion of the drill hole, and having an opening corresponding with the drill hole, for receiving an insertion of the drill bit into the drill hole, so as to aid in accurately inserting and positioning the drill bit into the drill hole.

[0017] Another important advantage of the present invention is that it provides an improved seismic tool assembly which utilizes a stabilizer having a threaded portion on an upper interior surface of the stabilizer and a securing portion threaded on a lower end thereof to permit threaded engagement of the securing portion to the threaded portion of the stabilizer so as to prevent disengagement of the drill stop member from the stabilizer during the drilling process.

[0018] Another important advantage of the present invention is that it provides an improved seismic tool assembly which utilizes a drill stop member having a lower portion, a recessed middle portion, and an upper portion, the lower portion and the upper portion having an outermost width that is greater than that of the recessed middle portion. The drill stop member is mounted on the stabilizer and has holding screws connected at opposed sides of an upper portion of the stabilizer, the holding screws being adjustably movable towards the recessed middle portion of the drill stop member so as to prevent disengagement of the drill stop member from the stabilizer during a drilling process, or adjustably movable away from the recessed middle portion of the drill stop member so as to permit disengagement of the drill stop member from the stabilizer.

[0019] Another important advantage of the present invention is that it provides an improved seismic tool assembly which utilizes a bit body which possesses extra cutting tips on an upper end thereof, with a view to widening the upper end of a drill hole so that a wider flange can be inserted therein, so as to further stabilize and support the stabilizer when limited tilting movement of the bit within the stabilizer is performed during the drilling process.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] The embodiments of the present invention will now be described by reference to the following figures, in which identical reference numerals in different figures indicate identical elements and in which:

[0021] FIG. **1** is a side view of an embodiment of the bit body of the seismic drilling bit of the present invention;

[0022] FIG. **2** is a side view of an embodiment of the seismic tool assembly before full connection thereof, and illustrating the cap portion that is to be mounted and secured to the stabilizer;

[0023] FIG. **3** is a side view illustrating an embodiment of a fully connected seismic tool assembly;

[0024] FIG. **4** is a side view illustrating the seismic tool assembly effecting initially, a drill hole, and then enlarging a lower end of the drill hole; and

[0025] FIG. **5** is a side view of a further embodiment of the bit body of the seismic drilling bit of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0026] The invention will be described for the purposes of illustration only in connection with certain embodiments; however, it is to be understood that other objects and advantages of the present invention will be made apparent by the following description of the drawings according to the present invention. While a preferred embodiment is disclosed, this is not intended to be limiting. Rather, the general principles set forth herein are considered to be merely illustrative of the scope of the present invention and it is to be further understood that numerous changes may be made without straying from the scope of the present invention.

[0027] The present invention consists of an improved seismic tool assembly designed for effecting a drill hole and enlarging a lowermost end thereof to have a greater circumference than that of the remainder of the drill hole whereby an anchor can be set more securely therein.

[0028] Referring to FIG. **3**, there is shown a seismic tool assembly for use in the later insertion and setting of anchors shown generally at **1** in accordance with a first exemplary embodiment of the present invention. In a preferred embodiment, as hereinafter described, the seismic tool assembly **1** is to be rotatably mounted onto a drill by way of a drill spindle (not shown). It will be understood that there are numerous variations as to the types of attachments to a drill or otherwise that the seismic tool assembly **1** of the present invention could be mounted thereon, as would be readily apparent to one skilled in the art.

[0029] In a preferred embodiment, the seismic tool assembly **1** is for use in the later insertion and setting of anchors into concrete, stone, masonry and cementuous materials (though it will be understood that other variations to this are possible) and comprises a seismic drilling bit **2**, a stabilizer **3**, and a cap portion **6**, as hereinafter described.

[0030] Preferably, the seismic drilling bit **2** will be made of a durable, machinable metal and is substantially cylindrical in shape. The seismic drilling bit **2** is, preferably, of a one-piece construction that comprises an upper end **5** and a lower end **9** which are integrally connected to one another.

[0031] With reference to FIG. **1**, it can be seen that the bit body **11** of the seismic drilling bit **2** can effect the drilling of a drill hole, and has a first diameter (and cutting radius) sized to readily fit into a drill hole (not shown), and possesses, as most conventional drill bits do, at least one cutting edge and at least one groove extending in a helical fashion along a length of the bit body **11** of the seismic drilling bit **2**. In a preferred embodiment, these extend along a substantial length of the bit body **11**, or, alternatively, extend along at least half a length of the bit body **11**.

[0032] The proximal upper end **5** of the seismic drilling bit **2** is constructed and arranged to be releasably secured to a drill by way of a drill spindle (not shown).

[0033] The lower end **9** of the seismic drilling bit **2** has a quad cutting portion **13** positioned at the lowermost end of the seismic drilling bit **2**, as seen in FIGS. **1** and **2**, the quad cutting portion **13** having a greater outermost width than that of the bit body **11** whereby, when the seismic drilling bit **2** is inserted fully into an lowermost end **43** of the drill hole **45** and rotated during the drilling process (as shown in FIG. **4**), so as to effect a conical shape in the drill hole **45**, the quad cutting portion **13** enlarge a circumference of the drill hole **45** at the lowermost end **43** thereof that is greater than the circumference of the remainder of the shaft of the drill hole.

[0034] With reference to FIG. **1**, the seismic drilling bit **2** also has at least one, and preferably two, additional carbide cutting tips **21** on approximately a middle portion of the seismic drilling bit **2**, just below the flange portion **17** of the stabilizer **3** (as hereinafter described), when the seismic tool assembly **1** is fully assembled, as seen in FIGS. **3** and **4**. By virtue of the seismic drilling bit **2** having additional carbide cutting tips **21**, it provides the seismic tool assembly **1** with a second cutting step to widen an upper end of the pre drilled borehole **45**, so that a wider flange portion can be inserted into the pre drilled borehole **45**. As seen in FIG. **4**, this provides for wider rotation of the seismic drilling bit **2** inside the flange portion **17** of the stabilizer **3**, and further stabilizes and supports the stabilizer **3** when limited controlled tilting movement of the bit **2** within the stabilizer **3** is performed during the drilling process, with a view to enlarging a lowermost end **43** of the drill hole **45** to receive an anchor.

[0035] The seismic tool assembly **1** further comprises, with reference to FIGS. **2** to **4**, a stabilizer **3** for receiving, and having mounted thereon, the cap portion **6**. The stabilizer **3** comprises a flange portion **17** constructed and arranged to extend into the drill hole **45** and abut an inside portion thereof. In an alternative embodiment (not shown), the flange portion **17** of the stabilizer **3** could be tapered at a distal end thereof so as to further aid in the accurate and gradual insertion of the seismic drilling bit **2** into the drill hole **45**. In a preferred embodiment, and with reference to FIG. **2**, side portions of the flange portion **17** have an elongated opening **19** defined along a length thereof, for allowing easier passage of the cutting portion of the carbide cutting tips **21** when the cutting tips **21** are inserted through the stabilizer **3**.

[0036] With reference to FIGS. **2** to **4**, the stabilizer **3** further comprises an upper portion **23** and a support portion **25** integrally connected to the flange portion **17**. It can be seen in FIG. **2** that the outermost diameter of the support portion **25** is greater than an outermost diameter of the upper portion **23**. Further, the stabilizer **3** also comprises, with reference to FIG. **4**, a recessed shoulder portion **27** on an interior thereof for restricting downward movement of the seismic drilling bit **2** within the stabilizer **3** to a pre-set depth, through virtue of an abutment portion **29** of the seismic drilling bit **2** (see FIG. **1**) only being able to be pushed downwardly within the stabilizer **3** to a certain point, at which it comes into contact with the recessed shoulder portion **27**, thus restricting further downward movement of the seismic drilling bit **2**.

[0037] Further, with reference to FIG. **4**, the support portion **25** of the stabilizer **3** will further comprise a recessed portion **26**. In essence, a bottom **28** of the support portion **25** will be in contact with an upper surface of the surface to be drilled, as shown in FIG. **4**. However, at the outermost end of support portion **25**, there is a recessed portion **26** on an underside thereof, which provides a gap between the support portion **25** and the surface to be drilled. In this manner, once the drilling process is completed, a screwdriver, lever or lifting tool or apparatus, for example, can be used to remove the stabilizer **3**, and its associated flange **17**, from the predrilled hole **45**, by inserting the screwdriver or level tool under the

recessed portion **26** to enable lifting of the stabilizer **3** from its locked inserted position in the hole **45**.

[0038] Preferably, the stabilizer **3** has a central opening (not shown) which corresponds with the opening of the drill hole **45**. In an alternative embodiment (not shown), the central opening on the stabilizer **3** can have a shape which corresponds substantially to a shape of the cutting tips **21** for receiving, and allowing therethrough, the insertion of the seismic drilling bit **2**.

[0039] The seismic tool assembly **1** further comprises, with reference to FIG. **2**, cap portion **6**, which also possesses an opening defined therethrough (not shown) for receiving an insertion of the seismic drilling bit **2**, which corresponds with the central opening of the stabilizer **3**. In this manner, once the cap portion **6** is secured to the stabilizer **3** by virtue of locking means **15** (shown in FIG. **2**), as hereinafter described, these hold the seismic drilling bit **2** firmly in place within the assembly. When disengagement of the stabilizer **3** and cap portion **6** is desired, the locking means **15** can be depressed so as to permit the disengagement of the stabilizer **3** and cap portion **6** from each other.

[0040] With reference to FIG. **2**, as noted above, the seismic assembly of the present invention further comprises locking means **15**, which are positioned substantially upon the cap portion **6** for selectively preventing disassembly of the seismic drilling bit **2** from the cap portion **6** and the stabilizer **3**. In a preferred embodiment, the locking means **15** are spring loaded and positioned on each side of the cap portion **6** so that, when depressed simultaneously, they are movable to permit placement of the cap portion **6** on the stabilizer **3**. Once depression of the locking means **15** ceases, the locking means thus engage an outer surface of the upper portion **23** of the stabilizer **3**, restricting disengagement of the cap portion **6** from the upper portion **23** of the stabilizer **3**.

[0041] In operation, and as seen in FIG. **2**, the cap portion **6** is mounted upon the stabilizer **3**, and the seismic drilling bit **2** is inserted through the openings in the cap portion **6** and the stabilizer **3**. In mounting the cap portion **6** on the stabilizer **3**, a lowermost end of the cap portion **6** comes into contact an rests upon the support portion **25** of the stabilizer **3**, and, by virtue of the cap portion **6** having a slightly larger circumference than that of the upper portion **23** of the stabilizer **3**, the cap portion **6** completely surrounds and covers the upper portion **23**.

[0042] Of course, seismic drilling bit **2** is to be rotatably mounted onto a drill (not shown), and the assembly is positioned over a surface where a drill hole is to be made. Once the seismic drilling bit **2** is sunk to a pre-set depth and rotated, rotational drilling (and tilted rotational drilling as previously described) by the seismic drilling bit **2** can then be effected in creating an enlarged area of the lowermost end of a drill hole.

[0043] Of course, by virtue of the quad cutting portion **13** having a greater outermost width (and operational cutting radius) than that of the bit body **11** the quad cutting portion **13**, when the seismic drilling bit **2** is rotated, enlarges a circumference of the drill hole **45** at the lowermost end **43** (in creating the enlarged area). In this manner, once the enlarged area has been created, and the seismic drilling bit **2** removed from the drill hole, the anchor (not shown) can be inserted, and, when the anchors have been flanged outwardly by conventional means within the drill hole, the flange portions of the anchor can rest within the enlarged area, thus securely retaining the anchor in place.

[0044] FIG. **5** also illustrates a further embodiment of the bit body of the seismic drilling bit of the present invention, which can generally be used for very shallow depth drilling utilizing small drop-in anchors, such as for mechanical use concerning sprinkler systems, plumbing, Natural Gas & water piping equipment (such as above ceiling ac units). Again, the proximal upper end **5** of the seismic drilling bit **2** is constructed and arranged to be releasably secured to a drill by way of a drill spindle (not shown). The seismic drilling bit **2** possesses a round none fluted body **10** with a single carbide cutting tip **21**, as, in utilizing this arrangement, it does not lift the dust from drilling, in contrast to how a fluted body drill bit would operate. The seismic drilling bit **2** for shallow drilling has a quad cutting drilling head **13** but can, alternatively, also have a single cutting tip.

[0045] It will be apparent to those skilled in this art that various modifications and variations may be made to the embodiments disclosed herein, consistent with the present invention, without departing from the spirit and scope of the present invention.

[0046] Other embodiments consistent with the present invention will become apparent from consideration of the specification and the practice of the invention disclosed therein.

[0047] Accordingly, the specification and the embodiments are to be considered exemplary only, with a true scope and spirit of the invention being disclosed by the following claims.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A seismic tool assembly for effecting a drill hole and enlarging a lowermost end thereof for a later insertion and setting of anchors therein, the assembly comprising:

a substantially cylindrical bit body sized to fit into the drill hole, the bit body having a first end region constructed and arranged to be operatively connected to a drill and a second end region disposed generally opposite said first end region, wherein a quad cutting portion is positioned to protrude from the second end region and an upper cutting portion positioned on a substantially middle portion thereof, the quad cutting portion and the upper cutting portion each having an operational cutting radius greater than a cutting radius of the bit body;

a stabilizer for mounting within at least a portion of the drill hole and having a recessed interior portion, the stabilizer further comprising:

(a) a flange portion constructed and arranged to extend into the drill hole and abut an inside portion thereof;

(b) a central opening, the central opening providing a space between the bit body and the flange portion to permit limited tilting movement of the bit body during a drilling process to enlarge the lowermost end of the drill hole;

(c) a support portion integrally mounted on the flange portion;

(d) an upper portion integrally mounted on the support portion, the support portion having an outermost diameter greater than that of the upper portion; and

a cap portion having an opening defined therethrough corresponding with the stabilizer and for receiving an insertion of the bit body therethrough, the cap portion being constructed and arranged to cover and be positioned to surround the upper portion of the stabilizer.

2. The assembly as claimed in claim **1**, wherein the quad cutting portion extends outwardly from substantially around an entirety of the second end region.

3. The assembly of claim **1**, wherein the flange portion is tapered at a distal end thereof.

4. The assembly as claimed in claim **1**, wherein the drill bit is constructed and arranged for attachment to a power drill.

5. The assembly of claim **1**, wherein the opening in the stabilizer is positioned at a substantially central location of the stabilizer.

6. The assembly of claim **1**, wherein the bit body further comprises an abutment member formed thereon having a greater width than a remainder of the bit body.

7. The assembly of claim **1**, wherein an outermost end of the support portion further comprises a recessed portion on a bottom surface thereof, the recessed portion being constructed and arranged to provide a gap between the support portion and a surface to be drilled.

8. The assembly of claim **1**, wherein the stabilizer further comprises a recessed shoulder portion on an interior thereof which is constructed and arranged to contact the abutment member when the bit body is inserted therethrough, thus restricting downward movement of the bit body to a pre-set depth.

9. The assembly of claim **1**, wherein the assembly further comprises locking means positioned substantially around the cap portion for selectively stabilizing the bit body and for preventing disassembly of the bit body from the cap portion and the stabilizer, wherein the locking means are spring loaded and further comprise a pair of engagement members positioned on each side of the cap portion whereby, when depressed simultaneously, the pair of engagement members are movable to permit placement of the cap portion on the stabilizer and, once depression of the locking means ceases, the pair of engagement members engage an outer surface of the upper portion of the stabilizer, restricting disengagement of the cap portion from the upper portion of the stabilizer.

10. A seismic tool assembly for effecting a drill hole and enlarging a lowermost end thereof for a later insertion and setting of anchors therein, the assembly comprising:

a substantially cylindrical bit body sized to fit into the drill hole, the bit body having a first end region constructed and arranged to be operatively connected to a drill and a second end region disposed generally opposite said first end region, wherein a quad cutting portion is positioned to protrude from the second end region and an upper cutting portion positioned on a substantially middle portion thereof, the quad cutting portion and the upper cutting portion each having an operational cutting radius greater than a cutting radius of the bit body, and wherein the bit body further comprises an abutment member formed thereon having a greater width than a remainder of the bit body;

a stabilizer for mounting within at least a portion of the drill hole and having a recessed interior portion, the stabilizer further comprising:

(a) a flange portion constructed and arranged to extend into the drill hole and abut an inside portion thereof;

(b) a central opening, the central opening providing a space between the bit body and the flange portion to permit limited tilting movement of the bit body during a drilling process to enlarge the lowermost end of the drill hole;

(c) a support portion integrally mounted on the flange portion, an outermost end of the support portion further comprising a recessed portion on a bottom surface thereof, the recessed portion being constructed and arranged to provide a gap between the support portion and a surface to be drilled;

(d) an upper portion integrally mounted on the support portion, the support portion having an outermost diameter greater than that of the upper portion; and

(e) a recessed shoulder portion on an interior thereof which is constructed and arranged to contact the abutment member when the bit body is inserted therethrough, thus restricting downward movement of the bit body to a pre-set depth, and wherein the recessed shoulder portion permits a tilted controlled rotation of the bit body within the stabilizer;

a cap portion having an opening defined therethrough corresponding with the stabilizer and for receiving an insertion of the bit body therethrough, the cap portion being constructed and arranged to cover and be positioned to surround the upper portion of the stabilizer;

locking means positioned substantially around the cap portion for selectively stabilizing the bit body and for preventing disassembly of the bit body from the cap portion and the stabilizer, wherein the locking means are spring loaded and further comprise a pair of engagement members positioned on each side of the cap portion whereby, when depressed simultaneously, the pair of engagement members are movable to permit placement of the cap portion on the stabilizer and, once depression of the locking means ceases, the pair of engagement members engage an outer surface of the upper portion of the stabilizer, restricting disengagement of the cap portion from the upper portion of the stabilizer.

11. The assembly of claim **10**, wherein the bit body has a non-fluted body.

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