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Cody et al.

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(54) **HIGH-TENSION HIGH-COMPRESSION FOUNDATION FOR TOWER STRUCTURES**

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(58) **Field of Search** 52/111, 153, 156, 52/157, 158, 166, 169.9, 295, 296, 741.15, 745.04, 745.17; 405/228, 244, 232, 252.1

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Primary Examiner—Brian E. Glessner

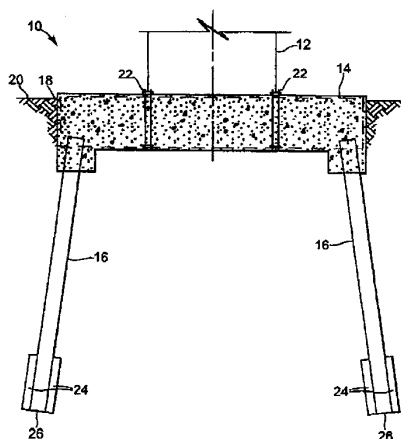
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(57) **ABSTRACT**

An above ground tower foundation uses embedded tension/compression components secured to a ground level cap. The components each terminate distally in a below ground soil or rock anchoring structure. The components embed without deep wide area site excavation or dewatering. The components with their distal anchoring structure provide exceptional bearing and tension capacity to the foundation, and high resistance to overturning moments acting on the tower. The tension/compression components may be straight or tapered piles with distal end helical fins, piles with a distal end grouted soil or rock anchor, caissons with a distal belled section, caissons with a distal end grouted soil or rock anchor, helical screw anchors or any combinations thereof

Construction of this foundation comprises the following steps. A minimal ground-level excavation is established for the cap. The tension/compression components embed into deep, high-strength soil layers without deep below ground excavation. The cap is formed. The components are secured to the cap. The tower attaches to the cap. Preferred tension/compression components are spin-fin piles—a pile with a helical fin at the distal pile end. The tension/compression components may be battered outwardly from the cap and tower.

20 Claims, 10 Drawing Sheets



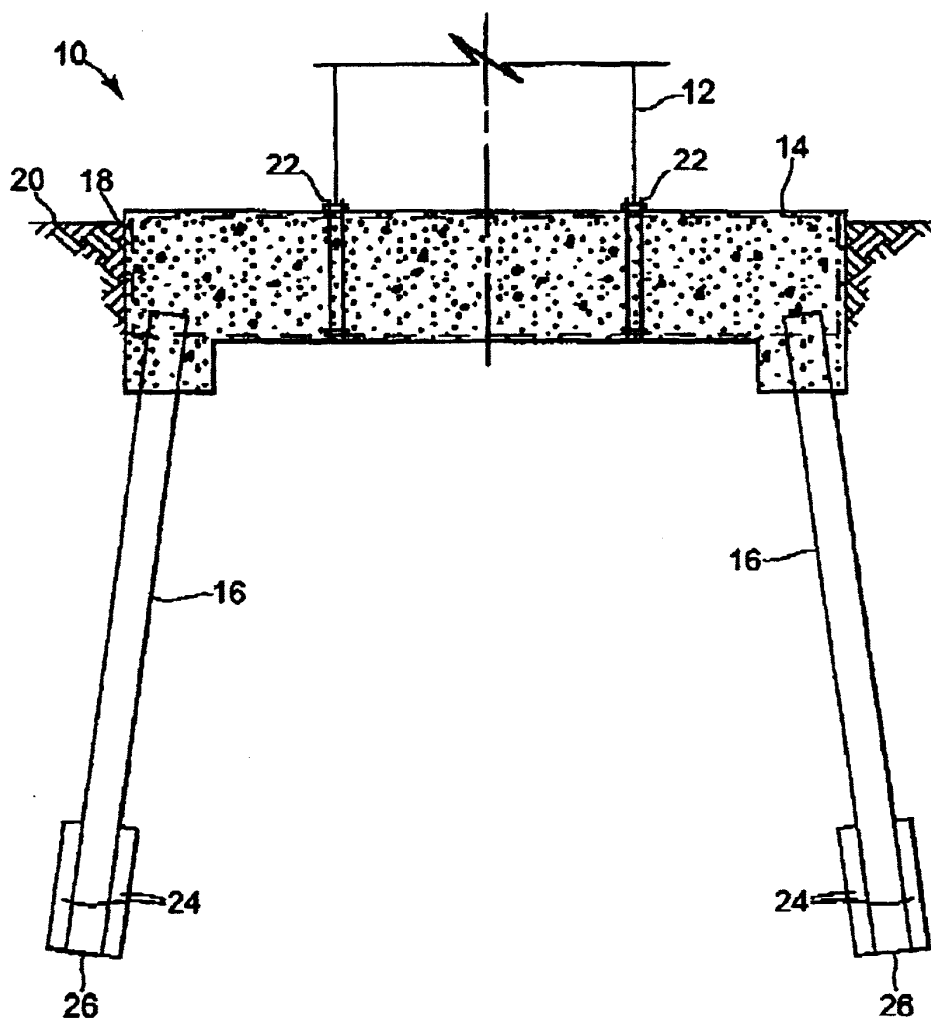


Fig. 1

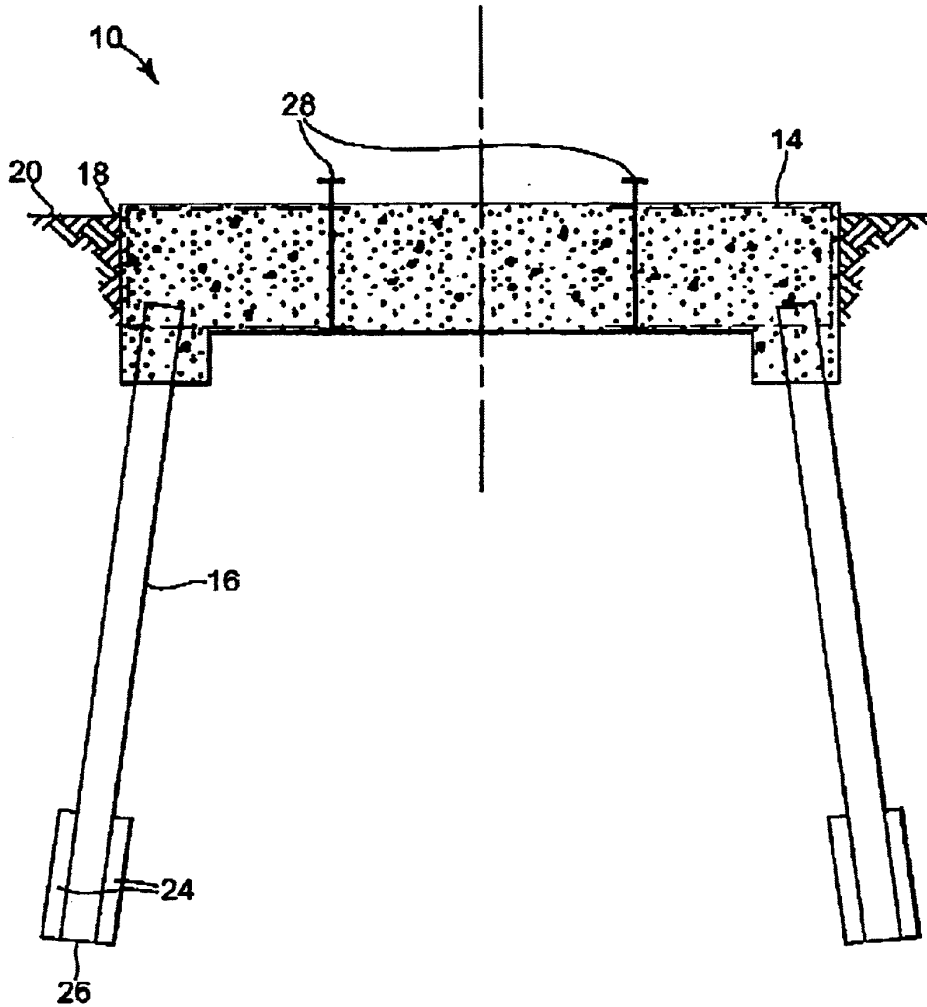


Fig. 2

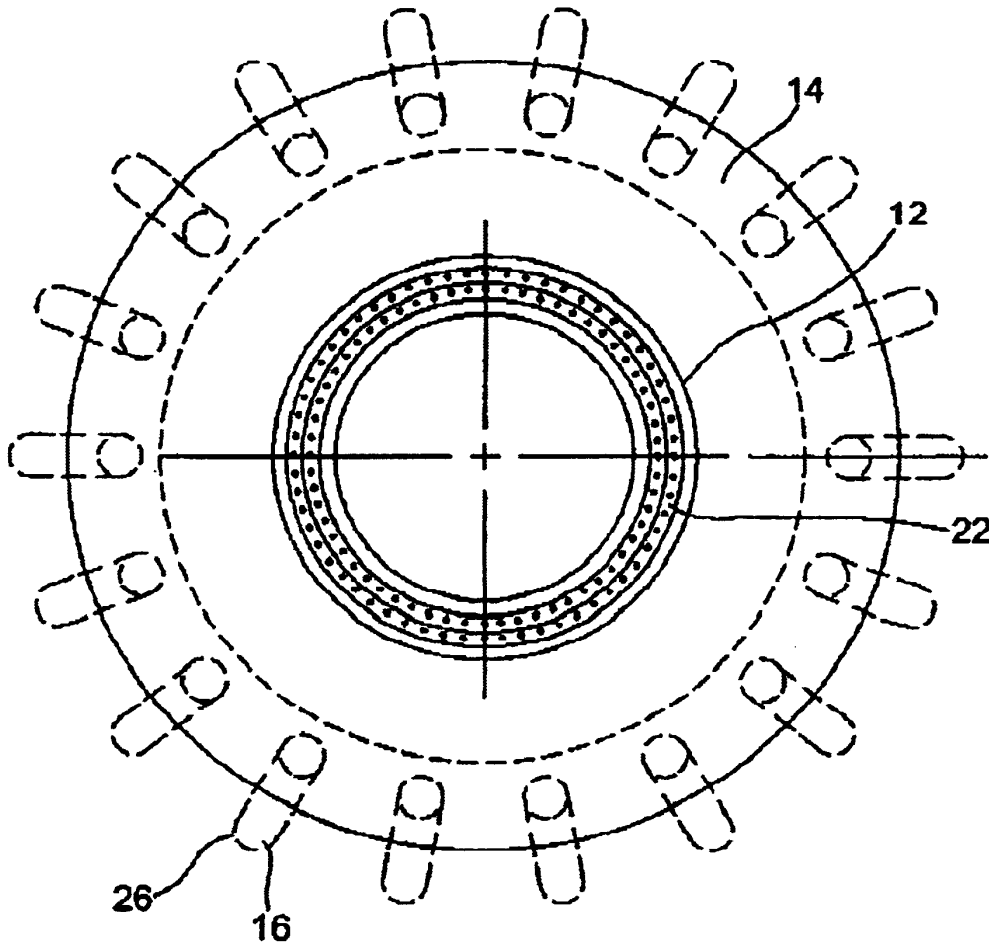


Fig. 3

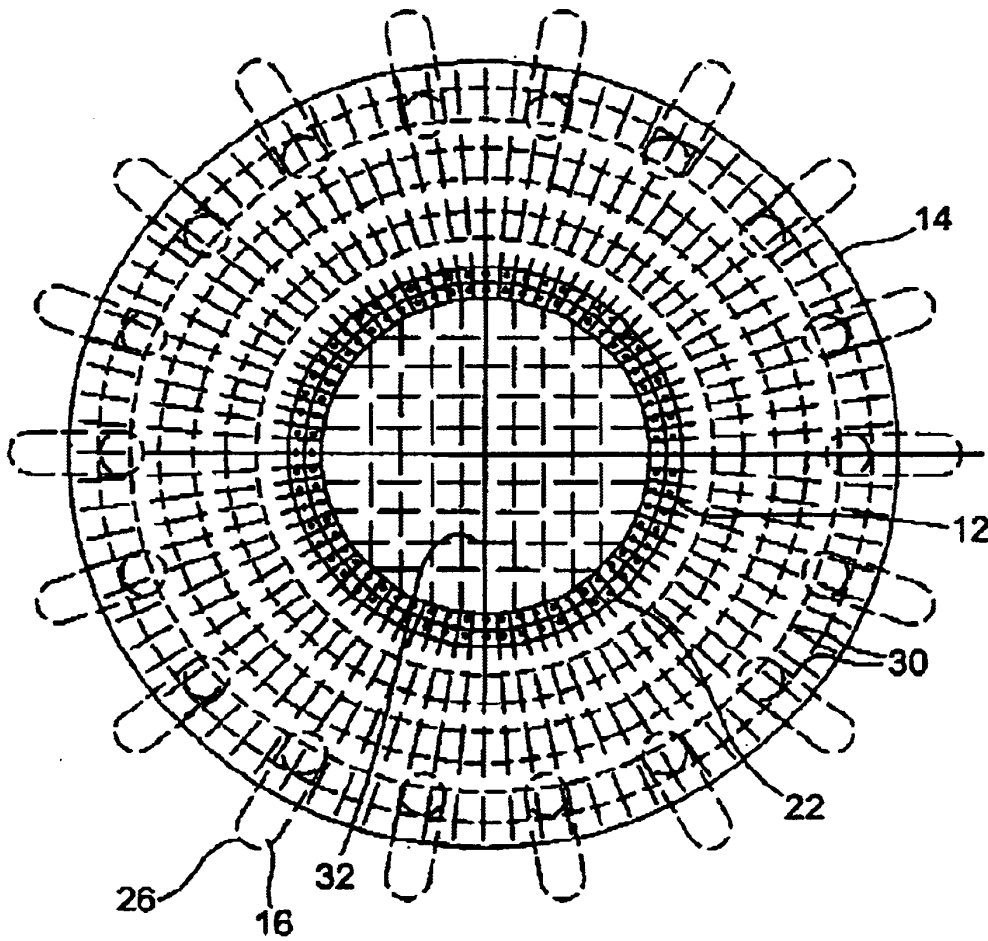


Fig. 4

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