US006390952B1

(12) **United States Patent**
Wilson

(10) **Patent No.: US 6,390,952 B1**
(45) **Date of Patent: May 21, 2002**

(54) **AUTO-BELAY ROCK CLIMBING DEVICES AND MODULAR CLIMBING TOWERS**

(75) Inventor: **Jeffrey D. Wilson**, Newcastle, CA (US)

(73) Assignee: **Extreme Engineering LLC**, Newcastle, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/374,877**

(22) Filed: **Aug. 16, 1999**

Related U.S. Application Data

(62) Division of application No. 09/105,903, filed on Jun. 26, 1998, now Pat. No. 6,083,142.
(60) Provisional application No. 60/073,016, filed on Jan. 29, 1998.

(51) **Int. Cl.**[7] **A63B 69/00**
(52) **U.S. Cl.** **482/37**; 482/43; 482/51; 482/69; 482/143; 182/71; 254/392; 254/398
(58) **Field of Search** 482/43, 51, 66, 482/69, 104, 143, 37; 182/3, 5, 8, 72, 71; 242/913; 254/392, 398

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Primary Examiner—Jeanette Chapman
Assistant Examiner—Victor Hwang
(74) *Attorney, Agent, or Firm*—Townsend and Townsend and Crew LLP

(57) **ABSTRACT**

The invention provides improved climbing devices and structures for use in mobile and fixed climbing installations. Modular climbing towers are generally assembled from panels having lateral curves by fastening upper and lower flanges of the panels together. The panels and flanges are integrally molded from fiberglass, and act as a monocoque structure. The climbing surface is on the radially outward portion of the partially or fully enclosed tower, thereby increasing the number of climbers that can safely be accommodated on a climbing surface of a given width. The invention also provides belaying devices for safely supporting a climber at the end of a flexible member such as a cable, rope, or the like. These belaying devices generally draw in the flexible member as the climber climbs. When the climber falls or completes the climbing route, the belay device supports the climber's weight, slowly and safely lowering the climber down to the ground. The exemplary auto-belay device makes use of a hydraulic piston mechanism to separate a pair of pulley assemblies. The flexible members runs back and forth between the pulley assemblies with a plurality of windings, so that the stroke of the hydraulic piston is significantly less than the height of the climbing structure.

12 Claims, 14 Drawing Sheets