



US006305309B1

(12) **United States Patent**
Ead et al.

(10) **Patent No.:** **US 6,305,309 B1**
(45) **Date of Patent:** **Oct. 23, 2001**

- (54) **ATTITUDE AND ROLL STABILIZER FOR TOWED UNDERSEA DEVICES**
- (75) Inventors: **Richard M. Ead**, Wakefield; **Robert L. Pendleton**, Portsmouth, both of RI (US)
- (73) Assignee: **The United States of America as represented by the Secretary of the Navy**, Washington, DC (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.: **09/556,362**
- (22) Filed: **Apr. 24, 2000**
- (51) **Int. Cl.**⁷ **B63G 8/14**; B63B 21/56
- (52) **U.S. Cl.** **114/245**; 114/242
- (58) **Field of Search** 114/244, 245; 43/42.02, 42.22, 43.13, 43.14

4,220,109 * 9/1980 Cholet 114/245
FOREIGN PATENT DOCUMENTS

1266466 * 6/1961 (FR) 114/244

* cited by examiner

Primary Examiner—S. Joseph Morano
Assistant Examiner—Andrew Wright
(74) *Attorney, Agent, or Firm*—Michael J. McGowan; Robert W. Gauthier; Prithvi C. Lall

(57) **ABSTRACT**

An attitude and roll stabilizer for towed undersea vehicles includes a vertical joining rod having an upper end and a lower end, a roll control weight mounted to the lower end of the vertical joining rod, an attitude control surface mounted to the upper end of the vertical joining rod, a tow rod pivotally mounted transverse to the vertical joining rod, an actuator member connected to the vertical joining rod between the tow rod and the roll control weight, and a connecting bar connecting the actuator adjacent to the aft end of the tow rod. A change in tow speed of the towed vehicle selectively pivots the tow rod about the vertical joining rod, and is correspondingly compensated for with a counteractive pitching of the attitude control surface and the roll control weight, thereby maintaining the level of the towed vehicle at the altered speed.

- (56) **References Cited**
U.S. PATENT DOCUMENTS
- 2,729,910 * 1/1956 Fryklund 43/9.7
- 2,825,994 * 3/1958 Bruhn 43/43.13
- 3,372,666 * 3/1968 Baker 114/245
- 3,453,980 * 7/1969 Shock 114/245

16 Claims, 4 Drawing Sheets

