



US006388184B1

(12) **United States Patent**
Glennig

(10) **Patent No.:** **US 6,388,184 B1**
(45) **Date of Patent:** **May 14, 2002**

(54) **DEPLOYABLE NOSE FOR AN UNDERWATER VEHICLE**

4,921,557 A * 5/1990 Nakamura 156/169
5,463,957 A * 11/1995 Jensen et al. 102/293

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FOREIGN PATENT DOCUMENTS

DE 3920818 A1 * 5/1990 F42B/12/10

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* cited by examiner

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 42 days.

(57) **ABSTRACT**

A deployable nose is used on an underwater vehicle to provide a shorter length when in a retracted position and to provide a reduced drag when in the deployed position. The deployable nose includes a plurality of nose sections and a deployment mechanism that moves the plurality of nose sections from the retracted position to the deployed position. The nose sections include a base nose section attached at the end of the underwater vehicle, an outer nose section having a rounded contour, and one or more intermediate nose sections between the base nose section and outer nose section. In the retracted position, the outer nose section and one or more intermediate nose sections are retracted generally within the base nose section. In the deployed position, the outer nose section and intermediate nose sections extend outwardly from the base nose section and interlock proximate the edges of the nose sections to form the deployed nose.

(21) Appl. No.: **09/678,878**

(22) Filed: **Oct. 4, 2000**

(51) **Int. Cl.**⁷ **F42B 19/00**

(52) **U.S. Cl.** **114/22; 89/1.809; 102/399; 244/3.1; 114/20.1**

(58) **Field of Search** 114/67 R, 20.1, 114/22; 102/399, 401, 404, 406; 244/158 A, 219, 49, 130, 120, 3.1

(56) **References Cited**

U.S. PATENT DOCUMENTS

- 4,304,186 A * 12/1981 Fischer et al. 102/401
- 4,368,671 A * 1/1983 Weber et al. 102/401
- 4,549,464 A * 10/1985 Hawkins et al. 102/293
- 4,569,300 A * 2/1986 Ferris et al. 114/20.1
- 4,579,058 A * 4/1986 Alker 102/401
- 4,770,369 A * 9/1988 Flock et al. 102/293

16 Claims, 2 Drawing Sheets

