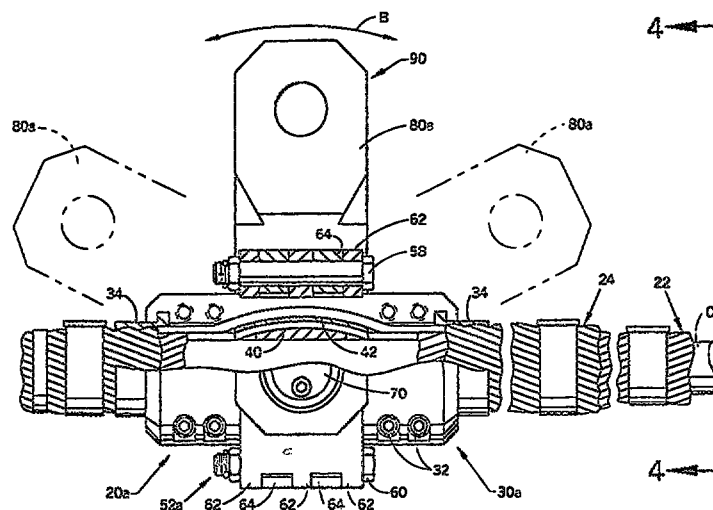




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : F16G 11/04	A1	(11) International Publication Number: WO 99/34132 (43) International Publication Date: 8 July 1999 (08.07.99)
(21) International Application Number: PCT/US98/24400 (22) International Filing Date: 17 November 1998 (17.11.98) (30) Priority Data: 09/000,741 30 December 1997 (30.12.97) US (71) Applicant: PMI INDUSTRIES, INC. [US/US]; 5300 St. Clair Avenue, P.O. Box 603280, Cleveland, OH 44103 (US). (72) Inventor: METZLER, Alan, R., Jr.; 6104 Chestnut Road, Independence, OH 44131 (US). (74) Agent: SHARPE, Albert, P., III.; Fay, Sharpe, Beall, Fagan, Minnich & McKee, 7th floor, 1100 Superior Avenue, Cleveland, OH 44114-2518 (US).	(81) Designated States: KR, NO, SG, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i>	

(54) Title: **SUSPENSION SYSTEM FOR A SEISMIC CABLE ARRAY**

(57) Abstract

A suspension system (10) for mid-span connection of a paravane (P) or other article to a cable (C1) of a towed cable array (A) includes first and second hanger assemblies (20a, 20b) connected to the cable (C1) in an axially spaced relationship. In particular, the hanger assemblies (20a, 20b) are connected respectively to first and second bulbous cable regions. The bulbous cable regions are formed on the cable using inner insert elements (40), a first set of preformed helical rods (22), outer insert elements (42) positioned over the first set of helical rods (22) in the region of the inner insert elements (40), and an outer set of preformed helical rods (24). Each hanger assembly (20a, 20b) includes a housing (30a, 30b) and a rotatable collar (52a, 52b) connected to the housing. An attachment member (80a, 80b) is pivotally connected to the collar and rotates therewith. The inner and outer insert elements (40, 42) of each bulbous region optionally include aligned apertures (144, 146) that receive an alignment pin when properly positioned about a cable (C1).