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[54] **METHOD FOR DETERMINING THE APPROXIMATE RESONANCE FREQUENCY OF A STRUCTURE SURROUNDED BY A COMPRESSIBLE FLUID**

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[57] **ABSTRACT**

A method for determining the approximate resonance frequency of a structure surrounded by a compressible fluid includes the steps of: (1) performing analysis to determine in-vacuo frequencies and mode shapes of the structure; (2) selecting an in-vacuo mode of interest, (3) computing an influence matrix at the eigenfrequency of the selected mode of interest; (4) combining the computed influence matrix with structural stiffness and mass matrices from a finite element program, and using the modified matrices computing eigenvalues of the structure, including eigenvectors; (5) selecting from the computed eigenvectors a computed mode having substantially the same displaced shape as the in-vacuo mode of interest; (6) determining the eigenfrequency of the selected computed mode; (7) determining any difference between the computed eigenfrequency of the selected computed mode and the in-vacuo eigenfrequency of the selected in-vacuo mode of interest. The process iteratively returns to step (3) until the eigenvalues of the selected computed mode of step (5) and the in-vacuo eigenvalue substantially converge.

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[52] U.S. Cl. 73/579; 73/602; 364/550; 364/551.01

[58] Field of Search 73/579, 580, 581, 73/582, 583, 602; 364/550, 551.01, 484

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3 Claims, 9 Drawing Sheets

