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(54) **TUNABLE APPARATUS FOR GENERATING ENERGY FROM A FLUID FLOW INDUCED MOVEMENT OF A SURFACE STRUCTURE RELATIVE TO A FRAME WITH AT LEAST ONE ADJUSTABLE FRAME PORTION**

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(52) **U.S. Cl.**
CPC . ***F03B 17/06*** (2013.01); ***F03G 7/08*** (2013.01); *Y02E 10/28* (2013.01)

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CPC F03B 17/06; F03D 5/00; F03D 9/00; H02K 35/02; H02K 7/1892; Y02E 10/28; Y02E 10/70; Y02E 10/72
See application file for complete search history.

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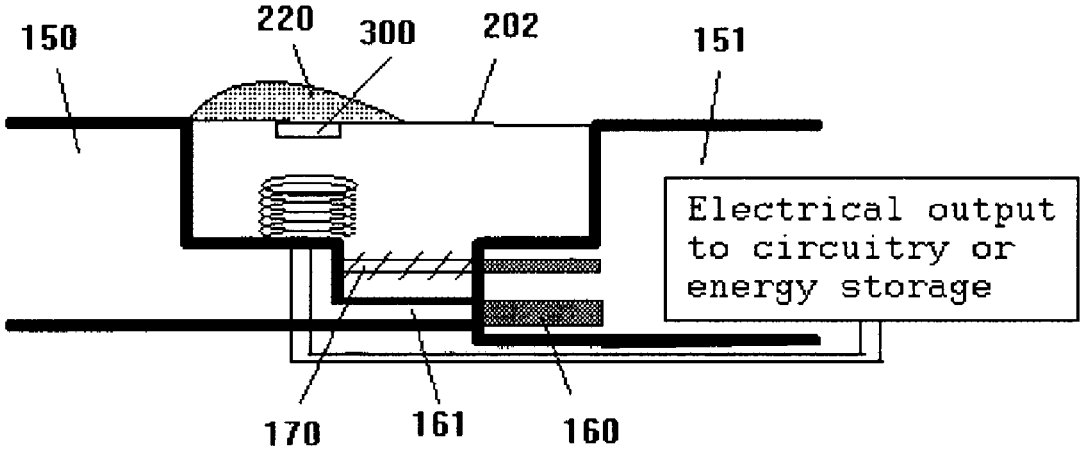
(57) **ABSTRACT**

A tunable generator has a surface structure for contacting an exterior fluid flow relative to a base structure. The contacting surface structure also has an electrogenerative portion positioned relative to the contacting structure and the base structure. The electrogenerative portion is preferably a piezoelectric or electromagnetic structure, although other types of structures are known within the art. The contacting surface is mechanically coupled to portions of the base structure through one or more elastic elements. The various portions of the base structure can be positioned relative to other base structure portions to alter the elasticity of the system or the tensioning of the elastic elements. The field of flow exerts forces upon the contacting structure which causes movement in the contacting surface structure relative to the base structure through the electrogenerative portion.

4 Claims, 11 Drawing Sheets