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## Patent Search

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### Abstract:

The present invention discloses a method and portable apparatus 100 for generating seismic vibrations and foreshocks. The portable apparatus 100 comprises a processor/microprocessor/ microcontroller (uP/uC) based seismic vibration generation system, comprising a stepper motor 108, coupled to the rotor of a synchro 110, with magnetic field designed to generate seismic vibrations and foreshocks. The apparatus 100 is configured to generate the seismic vibrations in the rotor of synchro 110 a reference earthquake. This in turn varies the frequency of the rotor voltage which is directly proportional to the instantaneous velocities of generated vibrations. Consequently the patterns of velocity and acceleration waveforms of seismic vibration are obtained at normal scale, enlarge scale, and magnified scale, respectively. These results are having a resemblance with the pattern of velocity and acceleration waveforms of reference earthquakes.

Complete Specification

## FIELD OF THE INVENTION

This invention is related to earthquake engineering, geophysical exploration, acquisition of seismic data for a more accurate prediction of earthquakes, and more particularly relates to method and apparatus for generating seismic vibrations and foreshocks.

## BACKGROUND OF THE INVENTION

Every year, earthquakes around the world are responsible for the loss of thousands of lives and result in billions of dollars of structural damage, both directly and indirectly from collateral damage aftermath. Earthquake events, as well as the related damage and losses caused thereby have increased in frequency and magnitude in recent years. It is well known that when an earthquake occurs, three sets of waves emanate from the point of origin: P (primary), S (shear) and R (Rayleigh). There are also Love waves and shear surface wave in addition to the S-wave, shear bulk wave. The speed of the Love waves is intermediate between S and R-waves. In seismic prospecting, a seismic disturbance is set up at a predetermined location, referred to as the shot point, and this disturbance produces seismic waves which travel through the ground, and at these waves being reflected from subterranean strata to geophone stations where the reflected waves are converted into electrical voltages representative thereof in a manner, valuable information regarding the nature and location of subterranean strata is obtained. The generation of seismic waves artificially is not very simple. For this purpose, underground nuclear explosion, blasting of dynamites, collapse of a large building and aircraft impacts, may be utilized. However, for conducting tests, these methods are not permitted or feasible. US Patent No. 7,136,325 B2, Nov. 14, 2006 discloses a vibration generator for seismic applications, comprising of the coils, copper brass sleeves, springs, electric lines with long cables. The vibration generator has an inherent issue of damping. Moreover, the performance of the components of the embodiment deteriorates with time. US Patent No. 10,197,694 B2, Feb. 5, 2019 discloses a controlled frequency downhole seismic source, comprising of multiple in

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