



US 20220368304A1

(19) **United States**(12) **Patent Application Publication** (10) **Pub. No.: US 2022/0368304 A1**
(43) **Pub. Date:** **Nov. 17, 2022**(54) **HIGH-POWER, FREQUENCY-TUNABLE, HARMONIC FILTERING SYSTEM FOR MULTIPLE OPERATING FREQUENCIES AND RELATED METHOD**(71) Applicant: **Phil Gelder**, Boston, MA (US)(72) Inventor: **Phil Gelder**, Boston, MA (US)(73) Assignee: **Tri-TeQ LLC**, Boston, MA (US)(21) Appl. No.: **17/739,126**(22) Filed: **May 8, 2022****Related U.S. Application Data**

(60) Provisional application No. 63/187,267, filed on May 11, 2021.

Publication Classification(51) **Int. Cl.**
H03H 7/01 (2006.01)(52) **U.S. Cl.**CPC **H03H 7/0115** (2013.01)(57) **ABSTRACT**

A high-power, frequency-tunable, harmonic filtering system for multiple operating frequencies includes a first SPMT switch circuitry, a second SPMT switch circuitry, and high-power, frequency-tunable harmonic filters (HFHFs). The first SPMT single-pole terminal is configured to receive a high-power RF input signal. The second SPMT single-pole terminal is configured to output a high-power RF output signal. Each of the HFHFs is connected to a respective one of the first SPMT multi-throw terminals and a respective one of the second SPMT multi-throw terminals. Each of the HFHFs is interposed between the respective first and second multi-throw terminals along a respective RF signal pathway between them. Each operating frequency is associated with one of the HFHFs. The respective operating frequency is associated with one of multiple cutoff frequencies of the respective HFHF. A frequency response of each of the HFHF is tunable to multiple cutoff frequencies in accordance with selection of respective shunt capacitances selectable under control of a controller.

