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Novas et al.**(10) Patent No.: US 11,129,806 B2**
(45) Date of Patent: *Sep. 28, 2021**(54) METHODS OF TREATING MULTIPLE SCLEROSIS****(71) Applicant: Biogen MA Inc., Cambridge, MA (US)****(72) Inventors: Mark Novas, Lexington, MA (US); Rui (Ray) Zhang, Sharon, MA (US)****(73) Assignee: Biogen MA Inc., Cambridge, MA (US)****(*) Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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G09B 19/00 (2006.01)**(52) U.S. Cl.**CPC **A61K 31/225** (2013.01); **A61K 9/0053** (2013.01); **A61K 9/28** (2013.01); **A61K 9/485** (2013.01); **A61K 9/4808** (2013.01); **A61K 9/4825** (2013.01); **A61K 9/4858** (2013.01); **A61K 9/4866** (2013.01); **A61K 47/542** (2017.08); **A61K 47/545** (2017.08); **G01N 33/492** (2013.01); **G09B 19/00** (2013.01); **A61P 25/00** (2018.01); **Y02A 50/30** (2018.01)**(58) Field of Classification Search**None
See application file for complete search history.**(56) References Cited****U.S. PATENT DOCUMENTS**4,959,389 A 9/1990 Speiser et al.
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Primary Examiner — Bong-Sook Baek*(74) Attorney, Agent, or Firm* — Choate, Hall & Stewart LLP; Brenda Herschbach Jarrell; Tracy L. Vrablik**(57) ABSTRACT**

Provided herein are methods of treating multiple sclerosis with a fumarate, wherein the fumarate is a dialkyl fumarate, a monoalkyl fumarate, a combination of a dialkyl fumarate and a monoalkyl fumarate, a prodrug of monoalkyl fumarate, a deuterated form of any of the foregoing, or a pharmaceutically acceptable salt, clathrate, solvate, tautomer, or stereoisomer of any of the foregoing, or a combination of any of the foregoing. The methods provided herein improve the safety of treatment by informing and monitoring patients undergoing treatment regarding progressive multifocal leukoencephalopathy, and/or by monitoring lymphocyte count.

11 Claims, 5 Drawing Sheets