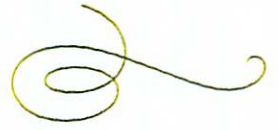
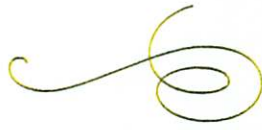


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*of the United States Patent and Trademark Office has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.*

*Therefore, this United States*

*Patent*

grants to the person(s) having title to this patent the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States of America or importing the invention into the United States of America, and if the invention is a process, of the right to exclude others from using, offering for sale or selling throughout the United States of America, products made by that process, for the term set forth in 35 U.S.C. 154(a)(2) or (c)(1), subject to the payment of maintenance fees as provided by 35 U.S.C. 41(b). See the Maintenance Fee Notice on the inside of the cover.

*Andres Ibarra*

DIRECTOR OF THE UNITED STATES PATENT AND TRADEMARK OFFICE



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**Yamada et al.**

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(45) **Date of Patent:** **Nov. 12, 2019**

(54) **MEDICINAL COMPOSITION, BLOOD TREATMENT DEVICE, COSMETIC, FOOD AND DRINK USING COMBUSTION SYNTHESIS MATERIAL**

(2013.01); **A61Q 19/00** (2013.01); A23V 2002/00 (2013.01); **Y02A 50/473** (2018.01); **Y02A 50/475** (2018.01)

(58) **Field of Classification Search**

CPC ..... **A61K 33/38; A61K 8/29; A61Q 11/00; A61Q 19/00**

See application file for complete search history.

(71) Applicants: **Osamu Yamada**, Osaka (JP); **OSU CORPORATION**, Osaka (JP)

(72) Inventors: **Osamu Yamada**, Osaka (JP); **Junpei Maruo**, Osaka (JP)

(73) Assignees: **Osamu Yamada**, Osaka (JP); **OSU CORPORATION**, Osaka (JP)

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**A23L 33/16** (2016.01)  
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CPC ..... **A61K 33/24** (2013.01); **A23L 2/52** (2013.01); **A23L 33/16** (2016.08); **A61K 8/11** (2013.01); **A61K 8/19** (2013.01); **A61K 8/25** (2013.01); **A61K 8/29** (2013.01); **A61K 33/00** (2013.01); **A61K 33/22** (2013.01); **A61K 33/26** (2013.01); **A61K 33/34** (2013.01); **A61K 33/38** (2013.01); **A61K 33/44** (2013.01); **A61Q 11/00**

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*Primary Examiner* — Andrew S Rosenthal

(74) *Attorney, Agent, or Firm* — MH2 Technology Law Group, LLP

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**ABSTRACT**

Disclosed are a pharmaceutical composition, cosmetic product, and food or drink product each comprising a porous ceramic obtained by combustion synthesis of a starting material comprising (1) titanium and (2) at least one member selected from the group consisting of carbon, boron, nitrogen, and silicon; a pharmaceutical composition and cosmetic product each comprising a radical- and nanobubble-containing liquid; and a blood treatment device comprising a blood flow channel for extracorporeal circulation of a patient's blood, the blood flow channel being provided with the porous ceramic above, and the porous ceramic and the blood are brought into contact with each other.

**9 Claims, 40 Drawing Sheets**