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Jovanov

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(54) LIQUID CONTAINER SYSTEMS AND METHODS FOR MONITORING USER HYDRATION

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See application file for complete search history.

(56) References Cited

U.S. PATENT DOCUMENTS

| 3,391,547 | A | 7/1968 | Kingston | |
|--------------|-----|---------|----------------|-------------|
| 5,135,485 | A | 8/1992 | Cohen et al. | |
| 5,182,545 | A | 1/1993 | Goekler et al. | |
| 7,928,835 | B1 | 4/2011 | Jovanov et al. | |
| 8,574,165 | B2 | 11/2013 | Mashiach | |
| 8,754,769 | B2 | 6/2014 | Stein et al. | |
| 8,863,649 | B1 | 10/2014 | Rao et al. | |
| 9,125,798 | B2 | 9/2015 | Stein et al. | |
| 9,358,183 | B2 | 6/2016 | Stein et al. | |
| 2004/0215521 | A1 | 10/2004 | Crisp, III | |
| 2016/0220184 | A1* | 8/2016 | Manion | A61B 5/4875 |

FOREIGN PATENT DOCUMENTS

WO 20130186688 A1 12/2013

* cited by examiner

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(57) ABSTRACT

A smart beverage container may be used to monitor user hydration. The container has at least one sensor for sensing an amount of liquid within the container. The liquid is monitored over time to determine an amount of liquid consumed by a user, and feedback is provided to the user indicating whether the user's liquid consumption is within a desired range according to a predefined profile of consumption. Such feedback may include information for indicating when the user is to consume additional liquid in order to remain in compliance with a desired liquid consumption regimen, as well as reminders to take additional liquid or warn the user if too much liquid had been consumed.

32 Claims, 24 Drawing Sheets

