

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
28 April 2022 (28.04.2022)



(10) International Publication Number
WO 2022/084749 A1

(51) International Patent Classification:

A47C 27/08 (2006.01) A41D 1/00 (2018.01)
A47C 31/12 (2006.01) A41D 31/04 (2019.01)
F15B 5/00 (2006.01) B60N 2/90 (2018.01)
F15B 15/00 (2006.01)

(21) International Application Number:

PCT/IB2021/000738

(22) International Filing Date:

22 October 2021 (22.10.2021)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/105,129 23 October 2020 (23.10.2020) US

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(81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, IT, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW,

(54) Title: SMART MATTRESS WITH ADAPTIVE ACTUATION SYSTEM

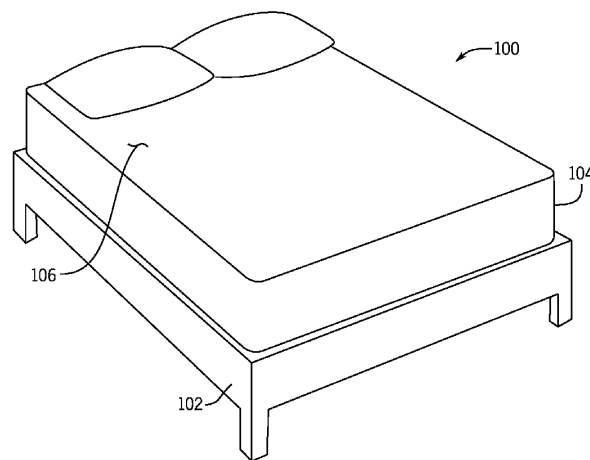


FIG. 1

(57) Abstract: A smart mattress and adaptive actuation systems for a flexible fabric are disclosed. The mattress can include a flexible fabric associated with a sleeping surface configured to engage a user arranged in a lying position. An actuation assembly can be configured to manipulate the sleeping surface. In one example, the actuation assembly includes a flexible bladder containing a fluid, and a pair of electrodes at least partially separated by the flexible bladder. The pair of electrodes can be configured to manipulate the fluid for changing a shape of the flexible bladder, and the sleeping surface can be responsive to the shape of the flexible bladder. The actuation assembly can also include an array of shapeable materials that change shape upon the receipt of heat. The sleeping surface can be responsive to the shape of the shapeable materials.

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SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN,
TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*