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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
13 April 2023 (13.04.2023)

WIPO | PCT

(10) International Publication Number
WO 2023/060285 A1

(51) International Patent Classification:
B25J 9/16 (2006.01)

(21) International Application Number:
PCT/US2022/077917

(22) International Filing Date:
11 October 2022 (11.10.2022)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
63/253,812 08 October 2021 (08.10.2021) US
63/253,867 08 October 2021 (08.10.2021) US

(71) Applicant: **CLUTTERBOT, INC.** [US/US]; 2093 Philadelphia Pike #1348, Claymont, DE 19703 (US).

(72) Inventors: **HAMILTON, Justin, David**; c/o Clutterbot, Inc., 2093 Philadelphia Pike #1348, Claymont, DE 19703 (US). **BANNISTER-SUTTON, Jack, Alexander**; c/o Clutterbot, Inc., 2093 Philadelphia Pike #1348, Claymont, DE 19703 (US). **FRIZZELL, Bryden, James**; c/o Clutterbot, Inc., 2093 Philadelphia Pike #1348, Claymont, DE 19703 (US).

(74) Agent: **AUERBACH, Robert**; 431 H Street, Crescent City, CA 95531 (US).

(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, CV, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, 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,

(54) Title: LARGE OBJECT ROBOTIC FRONT LOADING ALGORITHM

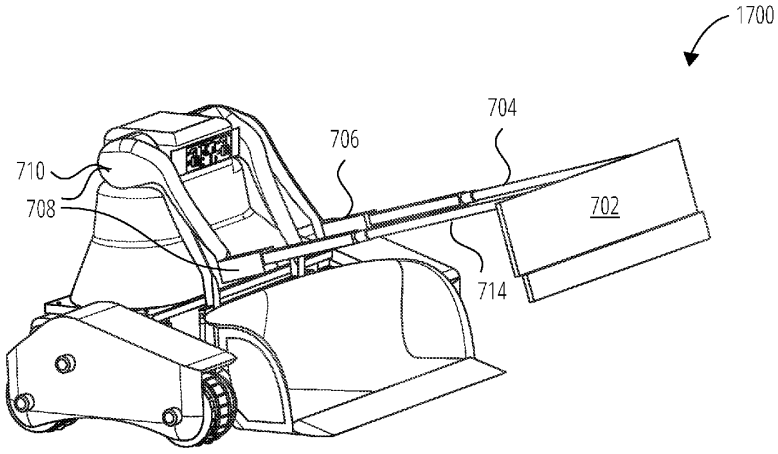


FIG. 17

(57) Abstract: A method and system are herein disclosed wherein a robot handles objects that are large, unwieldy, highly-deformable, or otherwise difficult to contain and carry. The robot is operated to navigate an environment and detect and classify objects using a sensing system. The robot determines the type, size and location of objects and classifies the objects based on detected attributes. Grabber pad arms and grabber pads move other objects out of the way and move the target object onto the shovel to be carried. The robot maneuvers objects into and out of a containment area comprising the shovel and grabber pad arms following a process optimized for the type of object to be transported. Large, unwieldy, highly deformable, or otherwise difficult to maneuver objects may be managed by the method disclosed herein.

WO 2023/060285 A1

[Continued on next page]

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, ME, 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).

Declarations under Rule 4.17:

— *as to the identity of the inventor (Rule 4.17(i))*
— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

Published:

— *with international search report (Art. 21(3))*