US012385200B2

(12) **United States Patent**
Ferkel

(10) **Patent No.: US 12,385,200 B2**
(45) **Date of Patent: Aug. 12, 2025**

(54) **ANIMAL FECES COLLECTING ROBOT**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 794 days.

(21) Appl. No.: **17/718,186**

(22) Filed: **Apr. 11, 2022**

(65) **Prior Publication Data**

US 2023/0323615 A1 Oct. 12, 2023

(51) **Int. Cl.**
E01H 1/00 (2006.01)

(52) **U.S. Cl.**
CPC ***E01H 1/006*** (2013.01)

(58) **Field of Classification Search**
CPC E01H 1/006
(Continued)

(56) **References Cited**

U.S. PATENT DOCUMENTS

10,555,498 B2 * 2/2020 Womble A01K 5/0114
11,933,005 B1 * 3/2024 Nichols E01H 1/006
(Continued)

FOREIGN PATENT DOCUMENTS

CN 107926737 * 4/2018 ..... G05D 27/02

OTHER PUBLICATIONS

CN107926737 machine translation (Year: 2018).*

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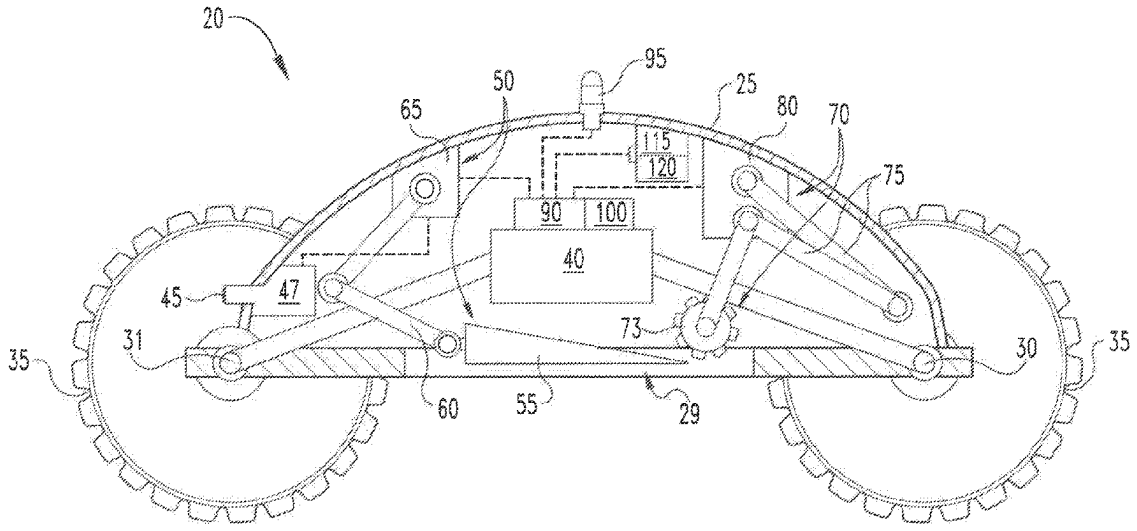
(57) **ABSTRACT**

The preset novel animal feces collection and storage system includes a stationary garage portion and a mobile robot portion. The stationary garage portion includes a garage housing, a door operationally connected to the garage housing, a door opener assembly connected to the garage housing and operationally connected to the door, a raised platform disposed within the garage housing, a ramp extending from the raised platform toward the door, an aperture formed through the raised platform, a bin disposed below the aperture, a charge port positioned within the garage housing, a power source operationally connected to the charge port, a first microprocessor positioned within the garage housing and operationally connected to the power source, a first transceiver operationally connected to the first microprocessor and to the power source, and a weight scale operationally connected to the bin, the power source, and the first microprocessor. The robot include a housing, spaced front and real axels operationally connected to the housing, spaced wheels operationally connected to each respective axel, a motor within the housing and operationally connected to the at least one respective axel, a battery disposed within the housing and operationally connected to the motor, a power jack extending through the housing and connected to the battery, a pan assembly operationally connected to the housing, a second microprocessor, a forward sensor assembly mounted to the housing and operationally connected to the second microprocessor, a guidance unit operationally connected to the second microprocessor and to at least one respective axel, a GPS transponder operationally connected to the robot housing, and to the second microprocessor, and a transceiver operationally connected to the second microprocessor. The microprocessor receives images from the forward sensor assembly and directs the guidance unit to steer the mobile robot to feces deposits. The second microprocessor sends signals to deploy the pan assembly to pick up feces deposits for transport back to the garage housing to be deposited into the bin.

6 Claims, 4 Drawing Sheets



(58) **Field of Classification Search**
USPC 701/228
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2019/0271125	A1*	9/2019	Fornarotto	G05D 1/0246
2022/0066456	A1*	3/2022	Ebrahimi Afrouzi	G06F 3/04883

* cited by examiner

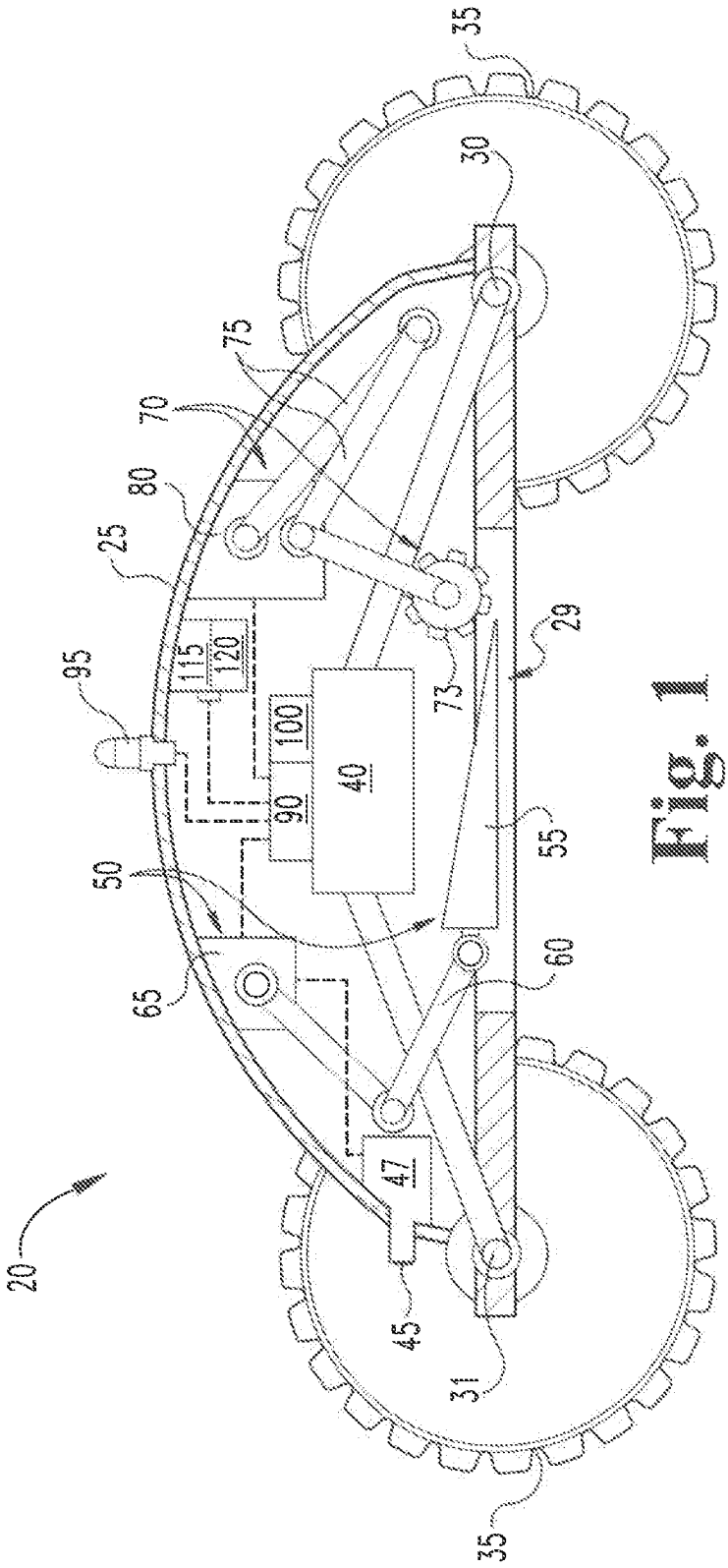


Fig. 1

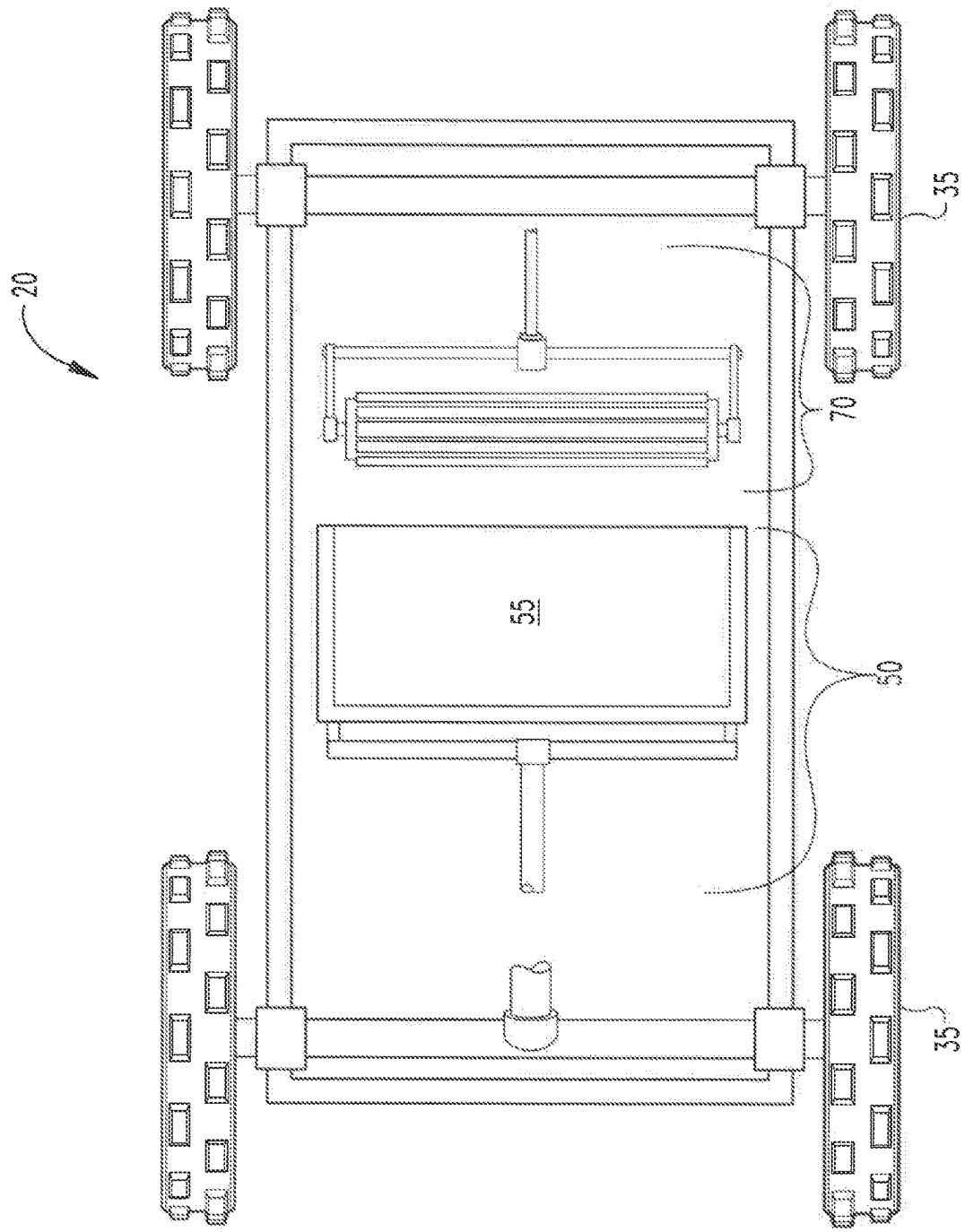


Fig. 2

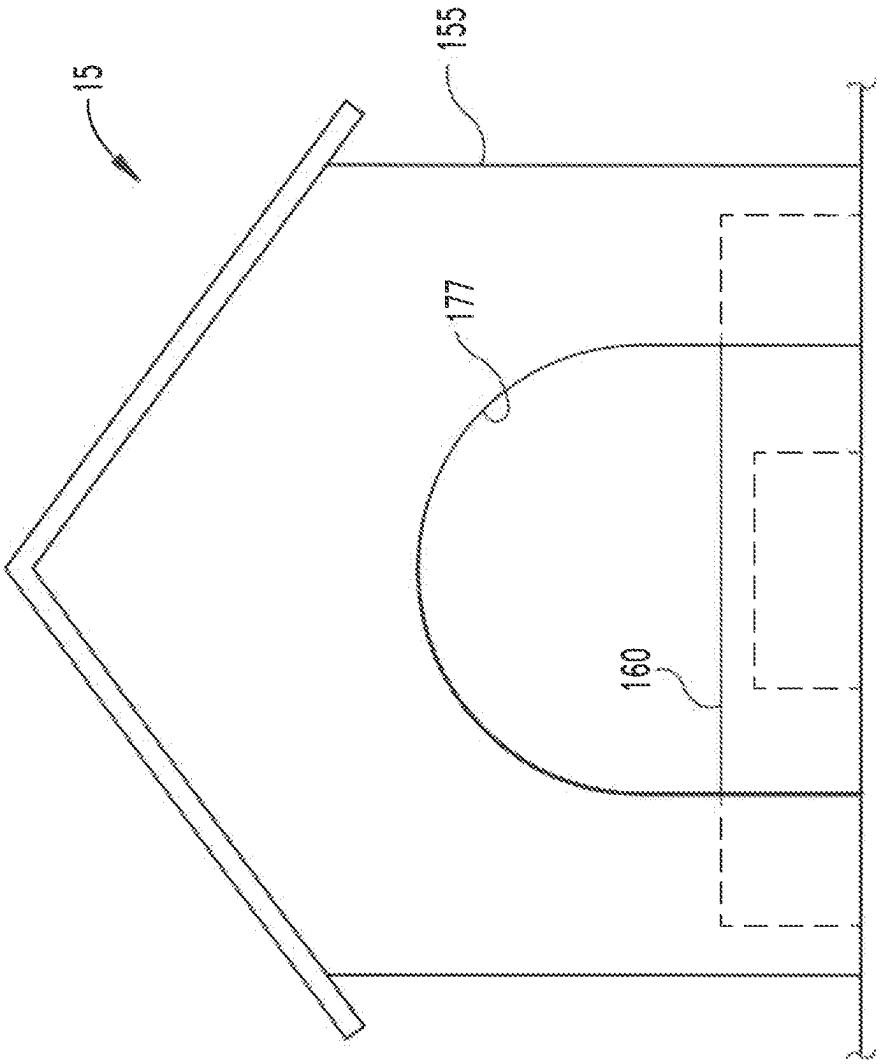


Fig. 3

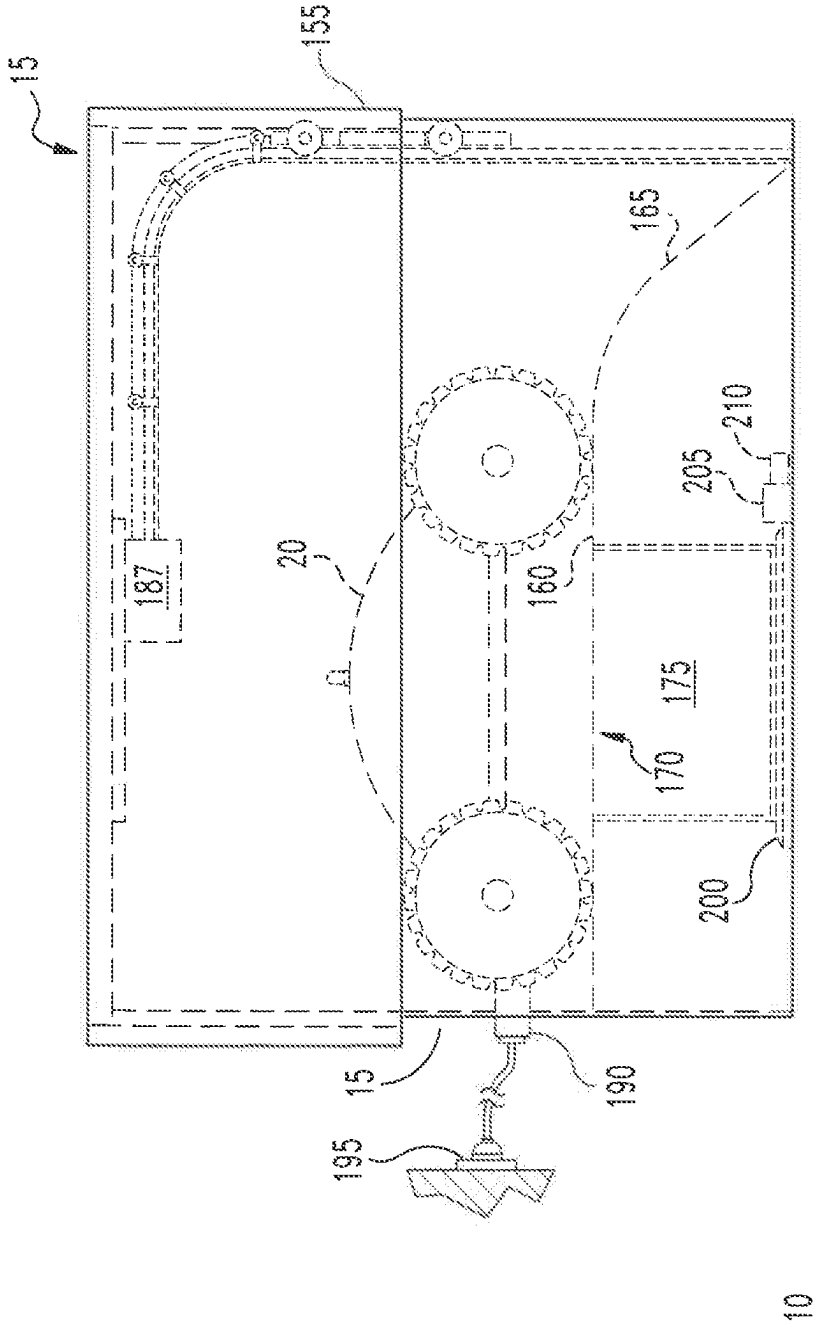


Fig. 4

ANIMAL FECES COLLECTING ROBOT

TECHNICAL FIELD

The present novel technology relates generally to the robotics, and, more particularly, to an automated roving robot for locating, collecting, and retrieving animal feces for storage and disposal.

BACKGROUND

Urban and suburban dog owners know that their yards will inevitably become littered with animal droppings that will eventually have to be picked up and disposed of. This is generally considered one of the least attractive elements of pet ownership. While poop-scoops and the like have been developed to make the collection and disposal process less odious, the pet owner still has to endure personally collecting and bagging the dog feces. Thus, there is a need for a device performs the unpleasant task of dog poop collection for you. The present novel technology addresses this need.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a side cutaway view of a first embodiment feces collection robot according to the present novel technology.

FIG. **2** is a top plan cutaway interior view of the embodiment of FIG. **1**.

FIG. **3** is a first front elevation view of a garage housing for receiving and recharging the embodiment of FIG. **1**.

FIG. **4** is a top plan cutaway view of the embodiment of FIG. **3**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

For the purposes of promoting an understanding of the principles of the novel technology and presenting its currently understood best mode of operation, reference will now be made to the embodiments illustrated in the drawings and specific language will be used to describe the same. It will nevertheless be understood that no limitation of the scope of the novel technology is thereby intended, with such alterations and further modifications in the illustrated device and such further applications of the principles of the novel technology as illustrated therein being contemplated as would normally occur to one skilled in the art to which the novel technology relates.

The novel technology shown in FIGS. **1-4** relates to a system or assembly **10** or retrieving, storing, and disposing of animal, typically dog, feces. The system **10** includes a stationary garage assembly portion **15** and a mobile or roving robot assembly portion **20**. The robot portion **20** is housed and recharged in the garage portion **15** when not in active feces collection mode.

The robot portion **20** includes a generally elongated housing **25** defining an internal volume **27** and having a bottom opening **29**. A front axle **30** and a spaced rear axle **31** are disposed in the internal volume **27** and are operationally connected to the housing **25**. A plurality of wheels **35** are operationally connected to the axles **30**, **31**. An electric motor **40** is disposed within the housing **25** and operationally connected to at least one axel **30**, **31**. A power jack **45**, such as a USB or like port, extends through the housing **25** and is operationally connected to a battery **47** disposed within the housing **25** and operationally connected to the motor **40**.

A pan assembly **50** is also disposed in the interior volume **27**. Pan assembly **50** includes a generally flat elongated pan member **55** and a first articulated armature **60** operationally connected to housing **25** and to pan member **55**. The armature **60** may be operationally connected to motor **40** or to a separate servo **65** that is likewise connected in electric communication with battery **47**.

A roller assembly **70** is likewise disposed in the interior volume **27**. Roller assembly **70** includes a generally cylindrical roller **73** and a second articulated armature **75** operationally connected to the roller **73** and to the housing **25**. The armature **75** may be operationally connected to motor **40** or to a separate servo **80** that is likewise connected in electric communication with battery **47**.

A microprocessor **90** is also disposed in the interior volume **27** and operationally connected to the battery **47**, the motor **40**, and to the first and second servos **65**, **80**, if present. A sensor **95** is operationally connected to the housing **25** and connected in electric communication with the microprocessor **90**. The sensor **95** may be a camera or any other convenient sensor **95** capable of detecting and differentiating animal feces. The camera **95** may be stationarily mounted to face in a direction defined by the camera **95** as 'forward', or may be swivel/gimbal/pivotably mounted via a motor mount **105** such that the electronic controller **90** may control the movement and directionality of the camera **95**. A guidance system **100** may also be positioned within the interior volume **27** and operationally connected to the electronic controller **90**, the motor **40**, and/or an axel **30**, **31**. A GPS unit **115** and/or a transceiver **120** may likewise be connected to the housing **25** and operationally connected to the microprocessor **90**. The transceiver **120** may allow communication between the microprocessor **90** and an external control device, such as a computer or cell phone.

Garage assembly **15** typically includes a garage housing **155**, often shaped as a dog-house, and and a raised platform **160** positioned within the housing **155**. A ramp **165** extends from the raised housing to the ground. The raised housing includes an aperture **170** formed therethrough, with a collection bin **175** positioned under the platform **160** and below the aperture **170**. An entryway or doorway **177** is formed through the housing **160** and positioned to allow egress into the housing **160** and access to the ramp **165**. An automatic garage door **180** may be positioned within the housing **160** to block the entryway **177**. An automatic garage door opener assembly **185** may be operationally connected to the door **180**, including a motor **187** and tracks **189**.

A charge port **190** may be operationally connected to the platform **165** and/or to the housing **160** and operationally connected to a power source **195**. A weight scale **200** is operationally connected to the waste bin **175** for measuring when the bin **175** is full and in need of emptying. A microprocessor **205** is operationally connected to a transceiver **210** and to the weight scale **200** and garage door motor **187** for alerting a user that the bin **175** is full and for receiving a signal from the robot **20** to open and/or to shut the door **180**.

In operation, the rover assembly **20** is stored for charging and protection in the dog house garage **15** until needed. When desired, the rover assembly **20** is activated, such as by a signal from a control device received by the electronic controller **90** via the transceiver **120**. The electronic controller **90** send a signal to the opener assembly **185** which opens the door **180**. The rover assembly **20** energizes its motor **40** to move the rover down the ramp **160**, disengaging the power jack **45** from the charging port **190**. The rover **20** emerges from the housing **15** and proceeds to move over a

predetermined landscape area, such as a front lawn, a back lawn, and/or the like, using the camera **95** to scan for feces deposit. Upon detection of a feces deposit, the rover extends the pan **55** and roller **70** to urge the feces deposit onto the pan **55**. The pan is then retracted **55** to move the feces deposit into the rover body **27**. This process may be repeated until all feces deposits have been moved into the rover **20**. In some embodiments, the rover **20** is manually directed via control signals from received by the electronic controller **90**.

Once the rover **20** has collected the feces deposits, the rover **20** reenters the housing **15** and empties the feces through the bottom aperture **29** and housing aperture **170** into the collection bin **175**. The housing may weight the feces deposits using the scale **200**. The weight data is received by microprocessor **205**, which may send a signal via transceiver **200** when a predetermined mass of feces is present in the bin **175**, signaling a user that it is time for the bin to be emptied.

While the invention has been illustrated and described in detail in the drawings and foregoing description, the same is to be considered as illustrative and not restrictive in character. It is understood that the embodiments have been shown and described in the foregoing specification in satisfaction of the best mode and enablement requirements. It is understood that one of ordinary skill in the art could readily make a nigh-infinite number of insubstantial changes and modifications to the above-described embodiments and that it would be impractical to attempt to describe all such embodiment variations in the present specification. Accordingly, it is understood that all changes and modifications that come within the spirit of the invention are desired to be protected.

What is claimed is:

1. An automated animal feces collection and storage system comprising:

a stationary garage portion; and

a mobile robot portion;

wherein the stationary garage portion further comprises:

a garage housing;

a door operationally connected to the garage housing;

a door opener assembly connected to the garage housing and operationally connected to the door;

a raised platform disposed within the garage housing;

a ramp extending from the raised platform toward the door;

an aperture formed through the raised platform;

a bin disposed below the aperture;

a charge port positioned within the garage housing;

a power source operationally connected to the charge port;

a first microprocessor positioned within the garage housing and operationally connected to the power source;

a first transceiver operationally connected to the first microprocessor and to the power source; and

a weight scale operationally connected to the bin, the power source, and the first microprocessor;

wherein the mobile robot further comprises:

a robot housing;

spaced front and real axels operationally connected to the robot housing;

spaced wheels operationally connected to each respective axel;

a motor disposed within the robot housing and operationally connected to the at least one respective axel;

a battery disposed within the robot housing and operationally connected to the motor;

a power jack extending through the robot housing and connected in electric communication with the battery;

a pan assembly operationally connected to the robot housing and further comprising:

a generally flat elongated pan member;

a first articulated armature connected to the robot housing and to the generally flat elongated pan member;

a first servo operationally connected to the first articulated armature and to the battery;

a roller;

a second articulated armature connected to the robot housing and to the roller;

a second servo operationally connected to the second articulated armature and to the battery;

a second microprocessor operationally connected to the battery, to the first servo, to the second servo, and to the motor;

a forward sensor assembly mounted to the housing and operationally connected to the second microprocessor;

a guidance unit operationally connected to the second microprocessor and to at least one respective axel;

a GPS transponder operationally connected to the robot housing, and to the second microprocessor; and

a robot transceiver operationally connected to the second microprocessor;

wherein the microprocessor receives images from the forward sensor assembly and directs the guidance unit to steer the mobile robot to feces deposits;

wherein the second microprocessor sends signals to deploy the pan assembly to pick up feces deposits for transport back to the garage housing to be deposited into the bin.

2. The automated animal feces collection and storage system of claim **1** wherein the robot automatically collects feces from a predetermined area.

3. The automated animal feces collection and storage system of claim **1** wherein the second microprocessor receives manual control signals for guiding the mobile robot.

4. The automated animal feces collection and storage system of claim **1** wherein the first microprocessor sends a signal when the weight scale detects a bin weight exceeding a predetermined value.

5. The automated animal feces collection and storage system of claim **1** wherein the forward sensor is a camera.

6. An automated animal feces collection and storage assembly, comprising:

a stationary portion; and

a mobile robot portion;

wherein the stationary portion further comprises:

a raised platform;

a ramp extending from the raised platform;

an aperture formed through the raised platform;

a bin disposed below the aperture;

a charge port operationally connected to the raised platform;

a power source operationally connected to the charge port;

a first microprocessor operationally connected to the raised platform and operationally connected to the power source;

a first transceiver operationally connected to the first microprocessor and to the power source; and

a weight scale operationally connected to the bin, the power source, and the first microprocessor;

wherein the mobile robot further comprises:

a robot housing;

spaced front and real axels operationally connected to the robot housing;

spaced wheels operationally connected to each respective axel;

a motor disposed within the robot housing and operationally connected to the at least one respective axel;

a battery disposed within the robot housing and operationally connected to the motor;

a power jack extending through the robot housing and connected in electric communication with the battery;

a pan assembly operationally connected to the robot housing and further comprising:

a generally flat elongated pan member;

a first articulated armature connected to the robot housing and to the generally flat elongated pan member;

a first servo operationally connected to the first articulated armature and to the battery;

a roller;

a second articulated armature connected to the robot housing and to the roller;

a second servo operationally connected to the second articulated armature and to the battery;

a second microprocessor operationally connected to the battery, to the first servo, to the second servo, and to the motor;

a forward sensor assembly mounted to the housing and operationally connected to the second microprocessor;

a guidance unit operationally connected to the second microprocessor and to at least one respective axel;

a robot transceiver operationally connected to the second microprocessor;

wherein the microprocessor receives images from the forward sensor assembly and directs the guidance unit to steer the mobile robot to feces deposits;

wherein the second microprocessor sends signals to deploy the pan assembly to pick up feces deposits for transport back to the garage housing to be deposited into the bin.

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