Claims

1. A separating apparatus (10), in particular a smart waste container, for separating and receiving reusable objects and residual waste, comprising:

a first receiving container (30a) for receiving residual waste;

a second receiving container (30b) for receiving objects being labeled with an RFID identifier;

a sorting device;

wherein the sorting device comprises at least one RFID scanner (84) and is designed to detect, by means of the at least one RFID scanner (84) the objects being labeled with an RFID identifier; and

wherein the sorting device is further designed to transfer detected objects to the second receiving container (30b) and to transfer other objects to the first receiving container (30a).

2. The separating apparatus (10) according to Claim 1, further comprising:

an outer container (20) which, in relation to a virtual longitudinal axis (21) thereof, has a bottom surface (22) transverse to the longitudinal axis, a circumferential surface (24) arranged about the longitudinal axis, and an opening (26) located opposite the bottom surface of the outer container;

wherein the first receiving container (30a) has a bottom surface (32a), a circumferential surface (34a), and an opening (36a) located opposite the bottom surface of the first receiving container;

wherein the second receiving container (30b) has a bottom surface (32b), a circumferential surface (34b), and an opening (36b) located opposite the bottom surface of the second receiving container; and

wherein the first receiving container (30a) and the second receiving container (30b) are each arranged or arrangeable within the outer container (20) such that the opening (36a) in the first receiving container and the opening (36b) in the second receiving container are each oriented toward the opening (26) in the outer container, and the bottom surface (32a) of the first receiving container and the bottom surface (32b) of the second receiving container are each oriented toward the bottom surface (22) of the outer container.

3. The separating apparatus (10) according to Claim 2, wherein the sorting device comprises a collector (50),

wherein the collector is arranged, in the direction of the longitudinal axis (21), between the openings (36a, 36b) in the receiving containers (30a, 30b) and the opening (26) in the outer container (20),

wherein the collector comprises a planar segment (52), the segment extending transversely to the longitudinal direction (21) and being located between the opening (36a) in the first receiving container (30a) and the opening (36b) in the second receiving container (30b), as viewed from the bottom surface (22) of the outer container toward the opening (26) in the outer container.

4. The separating apparatus (10) according to Claim 2 or 3, wherein the sorting device further comprises a separating disk (60),

wherein the separating disk (60) is arranged, in the direction of the longitudinal axis (21), between the collector (50) and the opening (26) in the outer container (20),

wherein the separating disk (60) is arranged transverse to the longitudinal axis (21) and is rotatably mounted about the longitudinal axis,

wherein the separating disk (60) has a cut-out (62), the shape of which, as viewed in the direction of the longitudinal axis (21), is completely coverable by the shape of the segment (52).

5. The separating apparatus (10) according to any of Claims 2 to 4, wherein the sorting device further comprises at least one movement sensor (82),

wherein the at least one movement sensor (82) is designed to:

- detect a movement in a first predefined region, and
- upon detection of a movement in the first predefined region, transmit a movement signal to a control electronics system (87);

wherein the first predefined region, as viewed from the bottom surface (22) of the outer container (20) toward the opening (26) in the outer container (20), is located behind the segment (52) of the collector (50).

6. The separating apparatus (10) according to Claim 5,

wherein the at least one RFID scanner (84) is designed to:

- detect RFID signals from a second predefined region,
- read RFID identifier of the RFID signal,
- compare the RFID identifier with a set of predefined RFID identifiers, and
- upon detection of the RFID identifier corresponding to one in the set of predefined RFID identifiers, transmit a detection signal to the control electronics system (84);

wherein the second predefined region, as viewed from the bottom surface (22) of the outer container (20) toward the opening (26) in the outer container (20), is located behind the segment (52) of the collector (50).

7. The separating apparatus (10) according to Claim 5 or 6, wherein the sorting device further comprises a control electronics system (87) for controlling a motor (86), the control electronics system (87) being designed to:

- receive a movement signal from the movement sensor (82) and to receive a detection signal from the RFID scanner (84),
- determine whether a time difference between the reception of a movement signal and the reception of a detection signal is less than a predefined threshold,
- upon receiving a movement signal and determining that the time difference has exceeded the threshold, transmit a first control signal and then a second control signal to the motor (86),
- upon receiving a movement signal and determining that the time difference has not exceeded the threshold, transmit a third control signal and then a fourth control signal to the motor (86).

8. The separating apparatus (10) according to any of Claims 5 to 7, wherein the sorting device further comprises a motor (86), the motor (86) being designed to:

- upon receiving the first control signal from the control electronics system (87), rotate the separating disk (60) from an initial position in a first direction of rotation about the longitudinal axis (21), and upon receiving the second control signal, to rotate the separating disk (60) back to the initial position,
- upon receiving the third control signal from the control electronics system (87), rotate the separating disk (60) from the initial position in a second direction of rotation, the second direction of rotation being opposite the first direction of rotation, and upon

receiving the fourth control signal, to rotate the separating disk back to the initial position;

wherein the initial position is determined by the cut-out (62) in the separating disk (60) being located above the segment (52) of the collector (50), as viewed along the longitudinal axis (21) from the bottom surface (22) of the outer container (20) toward the opening (26) in the outer container (20); and

wherein the first direction of rotation is determined by the cut-out (52) in the separating disk (60) moving toward the opening (36a) in the first receiving container (30a).

9. The separating apparatus (10) according to any of Claims 2 to 8, further comprising a cover (70) having a depositing chute (72),

wherein the opening (26) in the outer container (20) is closed or closable by means of the cover (70);

wherein, in so far as this claim is dependent on Claim 3, when the outer container (20) is closed by means of the cover (70), the depositing chute (72) extends behind the segment (52) of the collector (50), as viewed from the bottom surface (22) of the outer container (20) toward the opening (26) in the outer container (20); and

wherein, in so far as this claim is dependent on Claim 5, at least one of the movement sensors (82) is arranged in the depositing chute (72) and/or the first predefined region comprises at least the interior of said depositing chute (72).

10. The separating apparatus (10) according to any of Claims 4 to 9,

wherein the separating disk (60) has a first edge or edge region (62a) and a second edge or edge region (62b) at the transition to the cut-out (62);

wherein the first edge or edge portion (63a) and the second edge or edge portion (62b) each extend from an inner region of the separating disk (60) to an outer region of the separating disk (60);

wherein the first edge or edge region (62a) is separated from the second edge or edge region (62b) by a virtual plane, the plane extending through the cut-out and the virtual longitudinal axis extending within the virtual plane;

wherein a first sweeping lip (63a) is attached to the first edge or edge region (62a) and a second sweeping lip (63b) is attached to the second edge or edge region (62b); and

wherein the first sweeping lip (63a) and the second sweeping lip (63b) each extend in

the longitudinal direction up to the position of the collector (50).

11. The separating apparatus (10) according to any of Claims 2 to 10,

wherein a first weight sensor (90a) is arranged on the first receiving container (30a), the first weight sensor being designed to determine the weight of the first receiving container when the separating apparatus (10) is positioned such that the longitudinal axis (21) of the outer container (20) is oriented substantially parallel to the gravitational direction and the bottom surface (22) of the outer container (20) is oriented substantially in the direction of the gravitational force; and/or

wherein a second weight sensor (90b) is arranged on the second receiving container (30b), the second weight sensor being designed to determine the weight of the second receiving container (30b) when the separating apparatus (10) is positioned such that the longitudinal axis (21) of the outer container (20) is oriented substantially parallel to the gravitational direction and the bottom surface (22) of the outer container (20) is oriented substantially in the direction of the gravitational force; and

wherein the first and/or the second weight sensor (90a, 90b) is designed to transmit the measured weight data to a web server.

12. The separating apparatus (10) according to any of Claims 2 to 11,

wherein the separating apparatus (10) is mounted with the bottom surface (22) of the outer container (20) thereof on a mobile mount; and

wherein the mount is designed to travel autonomously and is equipped with an on-board collision avoidance sensor system.

13. A reusable object for multiple use in a recycling system comprising the separating apparatus (10) according to any one of claims 1 to 14,

wherein the object has at least a portion made of plastic;

wherein the portion made of plastic has a cavity (156) that is suitable for being closed by welding to a cover (170) made of plastic; and

wherein the cavity (156) is designed to receive an RFID transponder (160).

14. A cover (170) made of plastic and suitable for closing the cavity (156) in the object according to Claim 13 by means of welding,

wherein the cover (170) is made of the same plastic as the portion of the object having the cavity (156).

15. The object according to Claim 13,

in which an RFID transponder (160) is located in the cavity (156),

wherein the cavity (156) is welded to a cover (170) according to Claim 14.

16. The object according to Claim 13 or 15,

wherein the object is a piece of reusable tableware,

wherein the reusable tableware is, for example, a cup (150), a mug, a plate, a bowl, a fork, a knife or a chopstick.

17. A recycling system for recycling reusable objects, comprising:

at least one object according to Claim 13, 15 or 16; and

at least one separating apparatus (10) according to any of Claims 1 to 12.

18. The recycling system according to Claim 17, further comprising at least one RFID scanner that can be positioned separately,

wherein the RFID scanner is suitable for:

- detecting RFID transponders (160),
- reading the RFID identifier,
- comparing a read RFID identifier with a set of predefined RFID identifiers, and
- triggering a warning signal upon detection of an RFID identifier corresponding to one in the set of predefined RFID identifiers.

wherein the warning signal is preferably an acoustic signal and/or a visual signal.