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(54) METHOD AND DEVICE FOR COMPACTING BIN WASTE

(57) The device (10)ncomprises a coupling part (200) and a pressing part (300) that is pivotally attached to the coupling part (200) by a conncting portion (320). The coupling part (200) comprises a fastening means (210) for fastening the coupling part (200) to a bin lid (22) so that the bin lid (22) can be utilised in compacting waste.

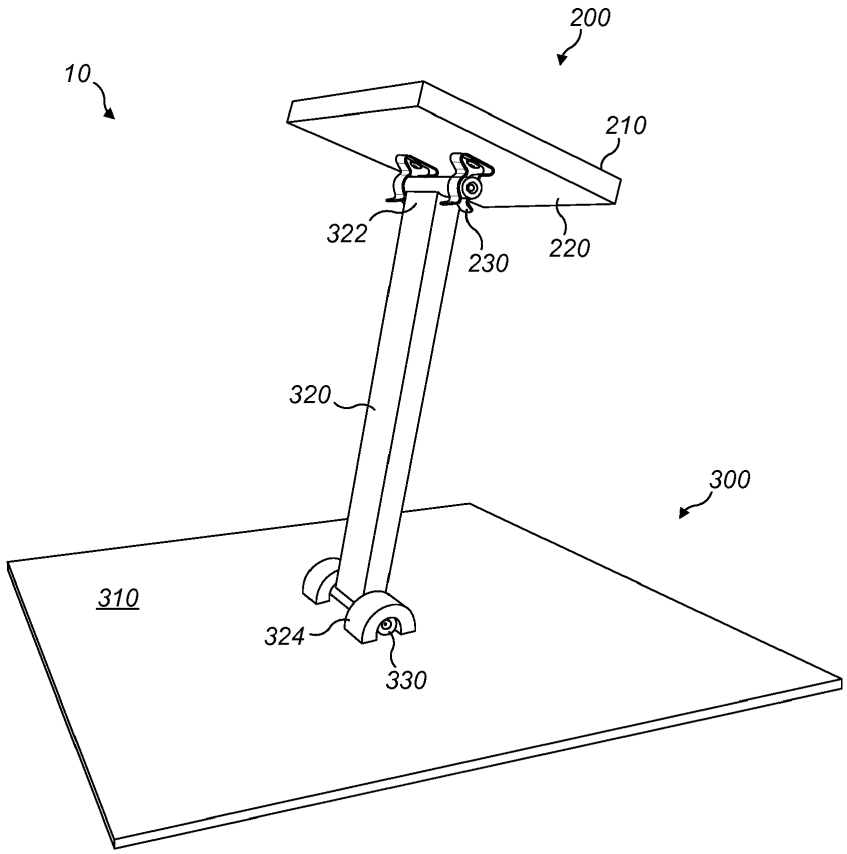

FIG. 1a

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Description

FIELD

[0001] The present invention relates to a device for compacting bin waste and a method of compacting bin waste. The device and method are particularly, although not exclusively, suited to compacting bin waste using bins with pivotally attached lids, such as a typical wheelie bin.

BACKGROUND

[0002] Conventionally, waste storage and disposal is achieved using a receptacle in the form of a bin. In domestic environments, exterior household bins are provided as wheelie bins with pivotally attached lids. This can also be said for some commercial environments. That is, the lids of such bins freely pivot about a main body of the bin and usually about the rim.

[0003] A common problem with dealing with household waste is that the amount of waste can exceed the interior space of the bin. The lid is then left partially open or the waste is put to one side. This can be unsightly, particularly in domestic environments, lead to the poor isolation of offensive smells emitted by the waste and can attract scavengers such as rats, foxes and badgers that are attracted to the smell. Furthermore, if the bin lid is partially open, the bin waste may not be collected, which is inconvenient.

[0004] To overcome the above problems some users compact the waste in order to keep the lid closed or compact the waste so that more waste can be stored in the bin. This is because typical household waste is compactable and reducing the size of the waste by compaction can free up space for avoiding overflow. Some current solutions involve pipework that attaches to an edge of the main body of the bin and is used to compress the waste. A problem with such solutions is that the pipework used to construct conventional compaction devices is heavy duty and cumbersome. Although large forces can be achieved with conventional compaction devices due to long handles that extend away from the main body of the bin, typical devices are not compact and easy to store. For example, the devices must be fully removed when not in use and stored away from the interior of the bin. The sheer bulk of such devices is awkward for a user and the need to store the devices is inconvenient.

[0005] It is therefore an aim of embodiments of the present invention to provide a more convenient solution to the problem of excess waste collection. It is an aim to provide a simple solution that is easy to operate and/or easy to store. Furthermore, it is an aim to provide a device that is intuitive to use and easy to install/remove.

[0006] Ultimately, it is an aim to provide a device for compacting waste and a method of waste compaction that overcomes at least some of the drawbacks of the conventional approaches mentioned herein or any such drawbacks that can be implied from teachings elsewhere.

SUMMARY

[0007] According to the present invention, there is provided a device for compacting bin waste, a bin comprising such a device, a method of compacting bin waste and a bin operable according to the method as set forth in the claims. Other features of the invention will be apparent from the dependent claims, and the description which follows.

[0008] A device is provided for compacting bin waste. That is, the device is suitable for pressing disposable matter contained within an interior of a waste receptacle such as a bin (e.g. wheelie bin). The device comprises a coupling part and a pressing part pivotally attached to the coupling part. That is, the coupling and pressing parts pivot about one another through at least one plane of motion. The rotational axis of the pivot may be parallel to the rotational axis of a bin lid when the coupling part is fastened to a bin lid. When a force is applied to the coupling part in the direction of the waste, a pressing force is transferred to the waste through the pressing part. Therefore, the pressing part is suitable for transferring a pressing force from a user to waste products contained within a receptacle such as a bin. The pressing part may therefore be configured to resist deformation when pressed into an interior of a bin by a user. The pressing part comprises an abutment portion for directly contacting waste and a connecting portion extending away from the abutment portion. The connecting portion therefore acts to space the abutment portion from the coupling part. Finally, the coupling part comprises a fastening means for fastening the coupling part to a bin lid to prevent relative movement between the coupling part and said bin lid. The fastening means may be provided as a chemical bond such as an adhesive, for example a contact adhesive that may be provided in the form of a pad. Alternatively, or additionally the fastening means may be a mechanical fastener, such as a screw or a nut and bolt. Alternatively, the fastening means may utilise a magnetic force. For example, the coupling part may comprise a magnet or a magnetic material attractable to the magnet and the bin lid may comprise a magnetic material or a magnet, respectively. Advantageously, the device is convenient and offers a more simplified solution over known devices. The omission of a handle means that the lid of the bin can be used to transfer forces towards the bin waste. Therefore, the device is arranged such that movement of the bin lid effects movement of the coupling part, which, when attached to the coupling part, moves the pressing part. This is particularly useful when the bin lid is hingedly attached to the main body of the bin (for example the rim). This applies to conventional wheelie bins but may also apply to other bins with pivotally attached lids, although the device can be used with bin lids that are not pivotally attached to a main body of a bin.

[0009] The coupling part is provided as an anchor for anchoring the device to a bin lid and distributing forces

between the device and bin lid. The coupling part may therefore comprise a plate. The coupling part may have a coupling face arranged to face an underside of the bin lid and may comprise a portion that is arranged to abut the underside of the bin lid. The coupling face may be provided on one side of the plate, which may be the side that opposes a side that is used for attaching the connecting portion. The plate may comprise a substantially flat surface for contacting and distributing force to an underside of a bin lid. The flat surface may be formed in the coupling face. The coupling part and abutment portion may both be plate shaped. The footprint of the abutment portion may be greater than the footprint of the coupling part.

[0010] The connecting portion may be an elongate member. That is, the length of the connecting portion may be far greater than a thickness and/or width. A direction of elongation of the connecting portion may be equal to the direction of extension away from the abutment portion. The connecting portion may have a length that is longer than a length of the coupling part. The connecting portion may comprise at least one of a thickness and a width smaller than a width of the coupling part.

[0011] The connecting portion may be adjustable in length. The connecting portion may be provided with a locking means to maintain a certain length. The adjustments of the connecting portion may be infinitely variable between two extremes or may comprise discrete increments. For example, the connecting portion may be provided as a plurality of elongate members that are moveable about each other, whereby one member may slide into the other. Positional control may be obtained using a series of female members such as notches and a single male member, such as a protrusion. Alternatively, a series of male members may be engageable with a single female member. The connecting portion may taper from one end to another. The connecting portion may comprise at least one reinforcement portion to resist buckling. The reinforcement portion may extend substantially the entire length of the connecting portion. The reinforcement portion may be made from a different material to the connecting portion

[0012] The connecting portion and abutment portion may be rigidly fixed to one another. Relative movement between the connecting and abutment portions may therefore be prevented. However, it is preferred that the connecting portion and abutment portion are moveable relative each other. The pressing part may comprise a pivot for providing pivotal movement of the abutment portion and connecting portion. The pivot is a pivot member that may be part of the connecting portion or abutment portion. The abutment portion and connecting portion may be releasable from one another. One of the abutment portion and connecting portion may comprise an accommodating means for holding the pivot member in place whilst allowing pivotal movement about the accommodating means. The accommodating means may be a plurality of female members that receive the pivot. Alternatively, the accommodating means may be a plurality of male members that engage with respective female portions on the pivot. Alternatively, the accommodating means may comprise at least one male portion together with at least one female portion.

[0013] The coupling part or connecting portion may comprise an attachment means for holding the other component. That is, the connecting portion may comprise a first end that is attachable to the attachment means. The attachment means may be of snap fit type. A snap fit is a holding means that is achieved by an attachment means that is biased towards a closed position. The attachment means may comprise divergent arms (i.e. flared tips) for guiding the first end into an accommodation area and snapping together to hold the part to be held in place. The snap fit is advantageous because separation of components is easy and quick. Therefore, a snap fit is a quick-release mechanism. This allows the connecting portion to be easily inserted into and removed from the attachment means. The attachment means may be provided by a clip. The clip may be biased towards a closed position and openable by exerting pressure towards the clip. The clip may be integral to a plate of the coupling part or may be removable by means of a fastener. This allows the clip to be easily repaired or replaced when needed. The clip may have an accommodation area that is complementary in shape to the pivot member to be held by the clip. The clip may be a tube clamp or pipe clip.

[0014] The first end of the connecting portion may be a pivot member receivable by the attachment means. The connecting portion may comprise a pivot member. The pivot member may be located at a second end opposite the first end. Therefore, both ends of the connecting portion may be pivot members. The connecting portion may be attachable to the central region of the abutment portion and/or the coupling part.

[0015] The pressing part may be a plunger and/or the abutment portion may be a piston. The periphery of the abutment portion may mimic the interior cross-section of a bin. Therefore, the abutment portion may be provided as plate with a generally square, circular or rectangular shape. The abutment portion may therefore have a width and/or length that is at least approximately 0.15m. The width and/or length may not exceed approximately 0.5m. Preferably, the width and/or length is between approximately 0.2m to approximately 0.35m. Most preferably, the width and/or length is between approximately 0.25m to approximately 0.3m. The abutment portion may have tapered or rounded edges to provide reduced resistance with an interior surface of a bin. The abutment portion may comprise a gripping portion, for example a so-called non-slip surface. That is, a portion that comprises a high coefficient of friction, which may be, for example at least 0.5. Advantageously, the waste material can be gripped to prevent relative movement when compaction occurs.

[0016] The device may be made from lightweight materials, for example plastic such as nylon or acrylic. Al-

ternatively, the device may be made from wood or metal, such as aluminium.

[0017] A bin comprising a device as previously described is provided. The bin comprises a lid pivotally attached to a main body of the bin and a coupling part of the device is fastened to the lid. That is, when fastened to the lid, the action of opening and closing the lid directly leads to the device being removed from or inserted into an interior of the bin for storing waste. The coupling part may be contained within the periphery of the lid of the bin. Therefore, when the lid is closed, the device may be fully concealed within the interior of the bin. The coupling part may have a coupling face arranged to face an underside of the bin lid. The coupling face may have a portion that is complementary in shape to the shape of the underside of the bin lid. This helps to accurately and securely engage the coupling part with the lid. The coupling part may be arranged at approximately the central region of the bin lid which may also be the central region of a cross-section of the interior of the lid.

[0018] A method of compacting bin waste is provided. The method comprises fastening a coupling part of a device to a bin lid using a fastening means in order to prevent relative movement between the coupling part and the bin lid. That is, the coupling part is restrained by the fastening means to hold a fixed position relative to the bin lid. This allows the coupling part and bin lid to move with each other and be provided as one. The method then comprises moving the bin lid, preferably by hand, from an open position and toward a closed position. During the lid closing motion, a pressing part of the device is inserted into an interior of a bin and towards bin waste stored in the interior of the bin. The method includes contacting waste in the interior of the bin using an abutment portion of the pressing part (i.e. an underside surface opposing the surface from which the connecting portion extends) and pressing waste by exerting a pressing force on the bin lid. Preferably, the pressing force is exerted manually. The bin lid is advantageously used to press the bin waster and distribute force to the bin waste. Preferably, the entire device is insertable into the interior of the bin so that the device can be conveniently concealed when not in use. The method of compacting bin waste may use the device as previously described.

[0019] The method may comprise the step of attaching the pressing part to the coupling part. Advantageously, a detachable pressing part allows the pressing part to be interchanged, for example, for repair or maintenance. The step of attaching the pressing part may be by snap fit. That step of attaching may include attaching a first end of the connecting portion to an attachment means of the coupling portion by snap fit. The attachment means may be a clip wherein the clip elastically deforms to allow the first end to snap into place. Other quick release mechanisms are possible, such as a quarter-turn fastener.

[0020] The step of fastening the coupling part to the bin lid may comprise applying adhesive or using a mechanical fastener between the coupling part and the bin lid. The step of fastening may include abutting the coupling part to an underside of the bin lid.

[0021] The step of pressing waste by exerting a pressing force on the bin lid may comprise pivoting the abutment portion about a connecting portion of the pressing part as waste is compacted. Furthermore, the step of moving the bin lid from an open position and toward a closed position may include allowing the pressing part to pivot freely relative to the coupling part. When a pivot member is provided between the connecting portion and the abutment portion, the step of moving the bin lid from an open position and toward a closed position may further include allowing the connecting portion to pivot freely relative to the abutment portion.

[0022] A bin is further provided that is operable according to the method as previously described.

[0023] Although a few preferred embodiments have been shown and described, it will be appreciated by those skilled in the art that various changes and modifications might be made without departing from the scope of the invention, as defined in the appended claims.

BRIEF DESCRIPTION OF DRAWINGS

[0024] For a better understanding of the invention, and to show how embodiments of the same may be carried into effect, reference will now be made, by way of example, to the accompanying diagrammatic drawings.

Figure 1a shows a first perspective view of a device for compacting bin waste.

Figure 1b shows a second perspective view of the device for compacting bin waste.

Figures 2a and 2b show a pressing part of the device for compacting bin waste in an unfolded and folded position, respectively.

Figure 3 shows a clip for retaining an axle or pivot member of a connecting portion.

Figure 4 shows the connecting portion pivotally retained by the clip.

Figure 5 shows the compacting device fastened to a bin lid of a bin having a pivotally attached bin lid.

Figure 6 shows a flow diagram of a method for compacting bin waste.

DESCRIPTION OF EMBODIMENTS

[0025] A device 10 for compacting bin waste is shown in Figure 1a and Figure 1b. The device comprises a first part 200 for fastening to a bin lid 22 in order to prevent relative movement between the first part and the bin lid. The first part may therefore be said to be a coupling part

200. Preferably, the coupling part is fastened to the bin lid by a fastening means 210. In the example shown an adhesive is used, for example, a double sided tape. As shown in Figure 1b, a removable layer is peeled away to reveal a side for adhering to the bin lid. Other forms of fastening may be used such as a mechanical fastener. Nevertheless, the fastening means is configured to prevent movement between the coupling part and the lid of the bin 20.

[0026] The device 10 further comprises a second part 300 that is pivotally attached to the first part 200. The second part is for pressing waste and is pivotally attached to the first part in order to allow rotation of the second part about the first part. The second part may therefore be referred to as a pressing part 300. The pressing part is configured to extend away from the coupling part 200 and is pivotally moveable about the coupling part. The pressing part comprises an abutment portion 310 and a connecting portion 320. The abutment portion is for directly contacting waste and is therefore a waste abutment portion and the connecting portion interconnects the coupling part and the abutment portion and extends away from the abutment portion and towards the coupling part.

[0027] Preferably, as shown in Figures 1a and 1b, the pressing part 300 is detachable from the coupling part 200 (see also Figures 2a and 2b) by means of a clip 230 that is opened and closed by a pressing force. The coupling part is therefore retainable by the clip by a snap fit function. The clip is an attachment means 230 that is attached to the coupling part and is engageable with the connecting portion 320 through pressure. That is, when a first end 322 of the connecting portion is pressed into the clip of the coupling part, the clip opens to receive the first end and hold the first end securely in place. Here, a plurality of clips is shown in order to grip a pivot member of the first end of the connecting portion. Advantageously, the connecting portion is removable from the coupling part in a reversible manner in a simple and effective way.

[0028] As shown in Figures 1a and 1b, the coupling part is a plate 220. Although it is preferred that the clip 230 is used in conjunction with the plate, the clip itself may also be a coupling part 200 and the plate may not be used.

[0029] In Figures 1a and 1b, the connecting portion 320 is provided with two pivot members 330 one at a first end 322 and another at a second end 324. The pivot members are integral to the connecting portion and the connecting portion is therefore I-shaped. The pivot members protrude sideways away from a main shaft of the connecting portion so that the pivot members can be received by respective attachment means 230 of the coupling part 200 and the abutment portion 310. As shown in Figure 1, the attachment means of the abutment portion has a slot for allowing the pivot member of the connecting portion 320 to slide in and out of the attachment means. However, this is only achieved at a certain degree of relative movement between the connecting portion and the abutment portion so that in normal circumstances the connecting portion and abutment portion remain pivotally attached.

[0030] The device 10 as shown in Figures 1a and 1b comprises essentially two plates 220,310 that are separated by an elongate member 320. The elongate member, i.e. the connecting portion 320, is reversibly attachable to a central portion of the coupling part 200 and the abutment portion 310 in order to distribute forces evenly. The coupling part and the abutment portion are plates which have a similar shape, i.e. a square shape. However, different shapes are possible and different combinations of shape are possible. For example, a one plate both plates may be rectangular or one plate may be square and the other rectangular. Preferably, the periphery of the abutment portion mimics the cross-sectional shape of an interior 26 of the bin 20 to which the device is used.

[0031] In use, movement of the coupling part 200, the abutment portion 310 and/or the connecting portion 320 is possible about each other in order to provide flexibility of the device 10. The device is therefore able to position itself appropriately in an interior 26 of a bin 20 in order to press the waste in an efficient manner.

[0032] Figures 2a and 2b show the pressing part 300 in an unfolded and folded position, respectively. When in the folded position, the connecting portion 320 is collapsed. That is, the connecting portion is moved towards the abutment portion 310 by pivotal movement about the pivot member 330. Movement in either a clockwise, or anticlockwise direction about the pivot member is possible, although only a clockwise direction is shown. Advantageously, when folded, the connecting portion protrudes away from the abutment portion by less than half of the length of the connecting portion. This allows the pressing part to be compact when folded for improved storage convenience. This allows the coupling part 200 to remain attached to the bin lid 22, while the pressing part is stored. A first end 322 of the pressing part can then be engaged with the coupling part when needed.

[0033] Figure 3 shows the attachment means 230 in the form of a clip. The clip comprises a retaining portion 232 which is located in-between a base 236 and an opening. The opening is formed by arms 234 which are flared to provide ease of insertion of the pivot member into the retaining portion 232. As shown in Figure 4 a plurality of clips are used to provide stable retention of the pivot member arranged at the first end 322 of the connecting portion 320. Furthermore, the coupling part 200 comprises a plate 220, which, in this example is planar (i.e. thickness that is far smaller than a width and length).

[0034] Figure 5 shows the device 10 when the coupling part 200 is fastened to the underside of a bin lid 22. The bin lid is opened in direction B and closed in direction A. That is, when moved in a first direction B, the bin lid moves away from an interior 26 of the bin 20 and when moved in a second direction A, the bin lid moved away the interior of the bin. When the bin lid is moved towards a closed position, the device is fully insertable into the interior of

the bin.

[0035] As shown, the bin lid 22 is pivotally attached to the body 24 of the bin 20. This provides controlled movement of the device 10 when the device is fastened to a bin lid. The coupling part 200 therefore moves with the underside of the bin lid and the pressing part 300 therefore enters the interior 26 of the bin 20. The abutment portion 310 first enters the interior 26 of the bin. Therefore, the abutment portion of the pressing part is able to directly contact waste before any other part of the device is able to. Advantageously, the user may close the bin lid and automatically press the bin waste without having to use handles provided on the device because the lid itself is opened and closed as necessary. Conveniently, the connecting portion 320 allows the abutment portion and coupling part to pivotally rotate about each other in order to provide flexible movement and effectively compress bin waste.

[0036] As shown in Figure 6, the method of operating the device 10 is shown. Specifically, the method S100 of compacting bin waste using a device 10 includes the step of fastening S110 a coupling part 200 to a bin lid 22 using a fastening means 210 to prevent relative movement between the coupling part and the bin lid. The bin lid is then moved S130 toward a closed position and a pressing part 300 is inserted into an interior 26 of a bin 20. The abutment portion 310 of the pressing part 300 then contacts S140 waste in the interior of the bin and the waste is pressed S150 by exerting a pressing force on the bin lid.

[0037] Advantageously, the method is simple and convenient for a user. The bin lid 22 can therefore be closed as normal and the device 10 can be concealed from view when not in use. No handle is provided on the device because the lid of the bin 20 is meant to be used to press the bin waste. Furthermore, the connecting portion 320 may be attached to the coupling part 200 by snap fit. That is, the coupling part comprises an attachment means 230 such as a clip that receives a first end 322 of the connecting portion in order to allow the connecting portion to pivotally rotate about the coupling part. Conveniently, the pressing part 300 is detachable from the coupling part in order to allow the pressing part to be repaired, maintained or replaced.

[0038] Overall, the device 10 and method S100 are advantageous over known devices because the device 10 can be easily stored and is easy to operate. Furthermore, the bin lid 22 itself is used to press the waste rather than a handle provided on the device which allows the device to be compact and able to be concealed within the interior 26 of the bin 20 when not in use. Advantageously the device is simple and convenient for a user.

[0039] Attention is directed to all papers and documents which are filed concurrently with or previous to this specification in connection with this application and which are open to public inspection with this specification, and the contents of all such papers and documents are incorporated herein by reference.

[0040] All of the features disclosed in this specification (including any accompanying claims, abstract and drawings), and/or all of the steps of any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive.

[0041] Each feature disclosed in this specification (including any accompanying claims, abstract and drawings) may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each feature disclosed is one example only of a generic series of equivalent or similar features.

[0042] The invention is not restricted to the details of the foregoing embodiment(s). The invention extends to any novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so disclosed.

Claims

1. A device (10) for compacting bin waste, the device comprising:

a coupling part (200); and
a pressing part (300) pivotally attached to the coupling part;
wherein the pressing part comprises:

an abutment portion (310) for directly contacting waste; and
a connecting portion (320) extending away from the abutment portion;

wherein the coupling part comprises a fastening means (210) for fastening the coupling part to a bin lid (22) to prevent relative movement between the coupling part and said bin lid.

2. The device (10) according to claim 1, wherein:

the coupling part (200) comprises an attachment means (230); and
the connecting portion (320) comprises a first end (322) attachable to the attachment means by snap fit.

3. The device (10) according to claim 2, wherein the first end (322) of the connecting portion (320) is a pivot member receivable by the attachment means (230).

4. The device (10) according to any preceding claim, wherein the abutment portion (310) and connecting portion (320) are moveable about each other.

5. The device (10) according to claim 4, wherein the pressing part (300) comprises a pivot for providing pivotal movement of the abutment portion (310) and connecting portion (320).

6. The device (10) according to claim 5, wherein the connecting portion (320) comprises a pivot member (330).

7. The device (10) according to any preceding claim, wherein the connecting portion (320) is elongate and the connecting portion has a length that is longer than a length of the coupling part (200).

8. The device (10) according to any preceding claim, wherein the coupling part (200) comprises a plate (220).

9. The device (10) according to any preceding claim, wherein the connecting portion (320) comprises at least one of a thickness and a width smaller than a width of the coupling part (200).

10. The device (10) according to any preceding claim, wherein the fastening means (210) is an adhesive.

11. A bin (20) comprising a device (10) according to any preceding claim, wherein the bin comprises a lid (22) pivotally attached to a main body (24) of the bin and a coupling part (200) of the device is fastened to the lid.

12. A method (S100) of compacting bin waste, the method comprising:

fastening (S110) a coupling part (200) to a bin lid (22) using a fastening means (210, 211) to prevent relative movement between the coupling part and the bin lid;
moving (S130) the bin lid toward a closed position and inserting a pressing part (300) into an interior (26) of a bin (20);
contacting (S140) waste in the interior of the bin using an abutment portion (310) of the pressing part; and
pressing (S150) waste by exerting a pressing force on the bin lid.

13. The method (S100) of claim 12 comprising the step of:

attaching (S120) the pressing part (300) to the coupling part (200) by snap fit.

14. The method (S100) according to any one of claims 12 and 13, wherein the step of fastening (S110) the coupling part (200) to the bin lid (22) comprises applying (S112) adhesive (210) between the coupling part and the bin lid.

15. The method (S100) according to any one of claims 12 to 14, wherein the step of pressing (S150) waste by exerting a pressing force on the bin lid (20) comprises pivoting (S152) the abutment portion (310) about a connecting portion (320) of the pressing part (300) as waste is compacted.

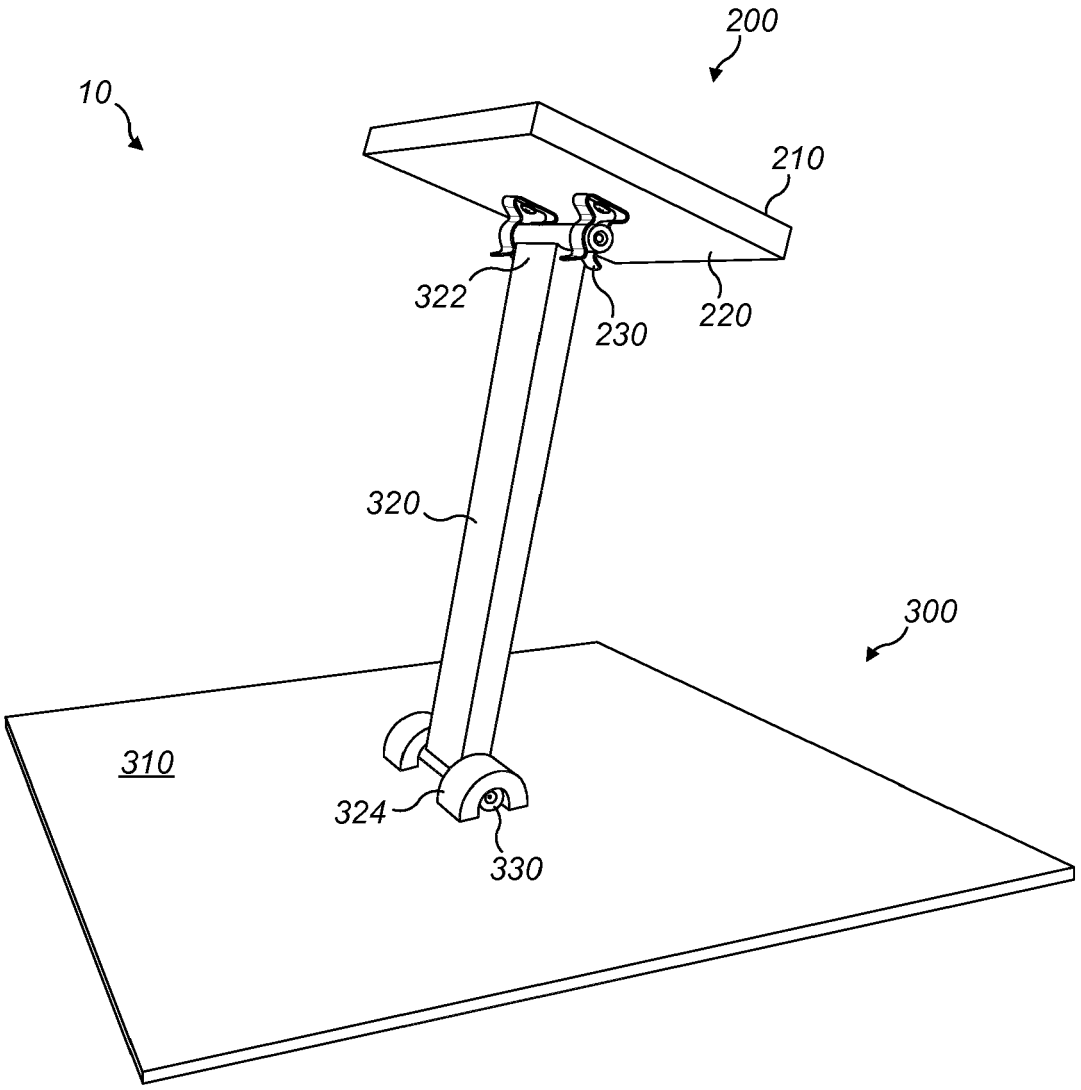

FIG. 1a

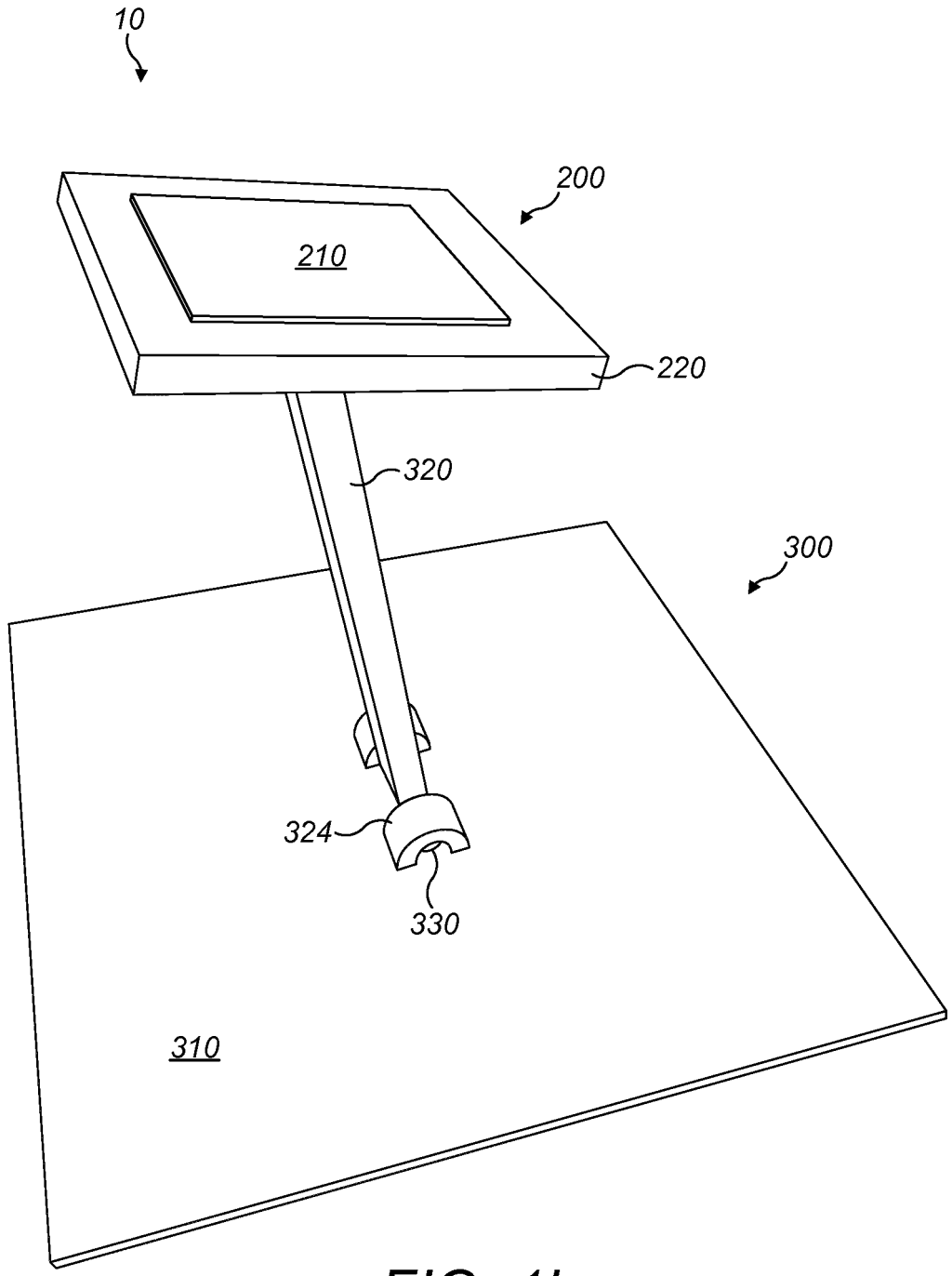

FIG. 1b

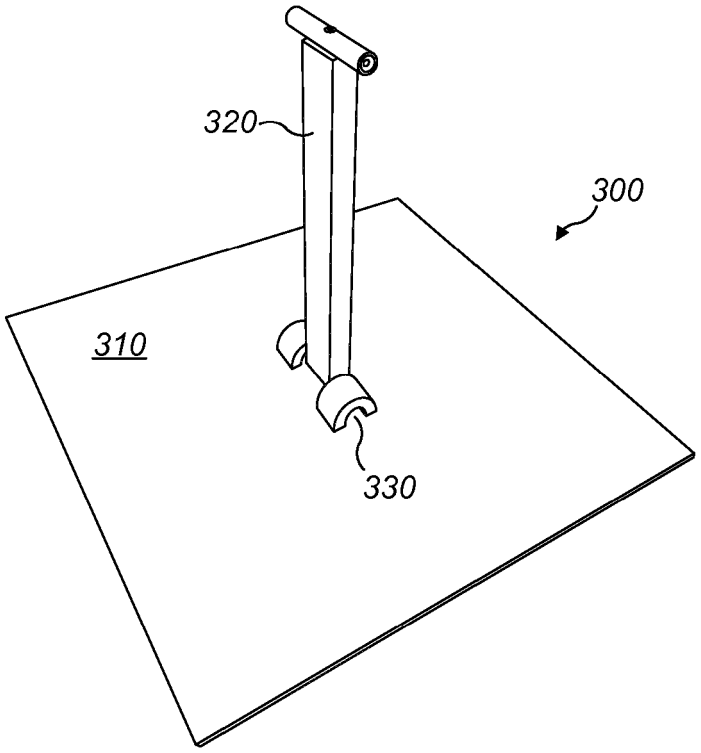

FIG. 2a

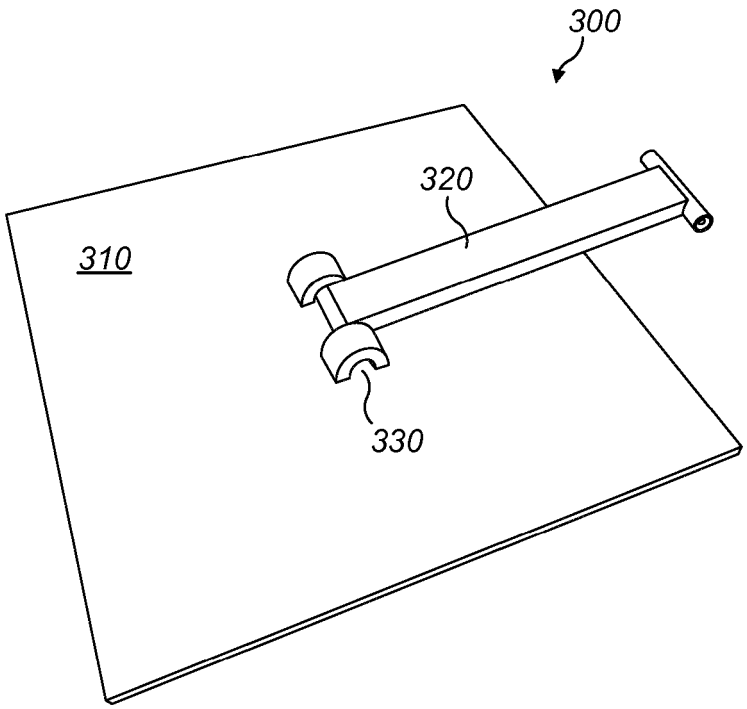

FIG. 2b

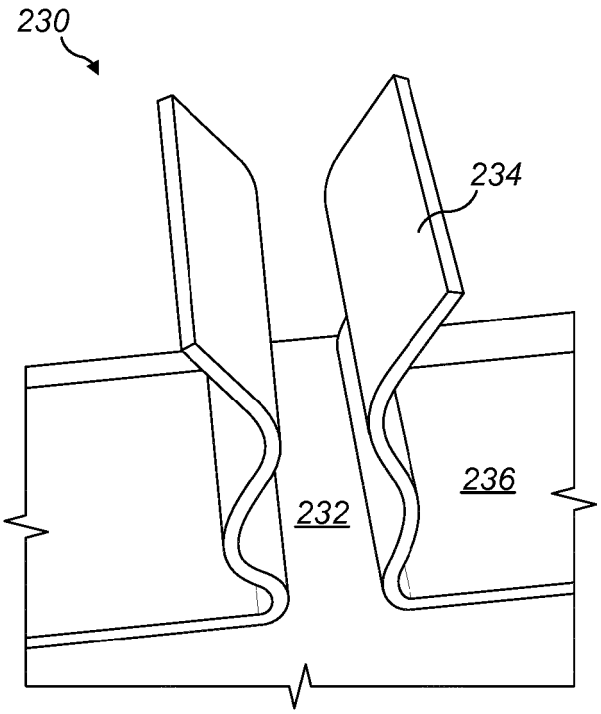

FIG. 3

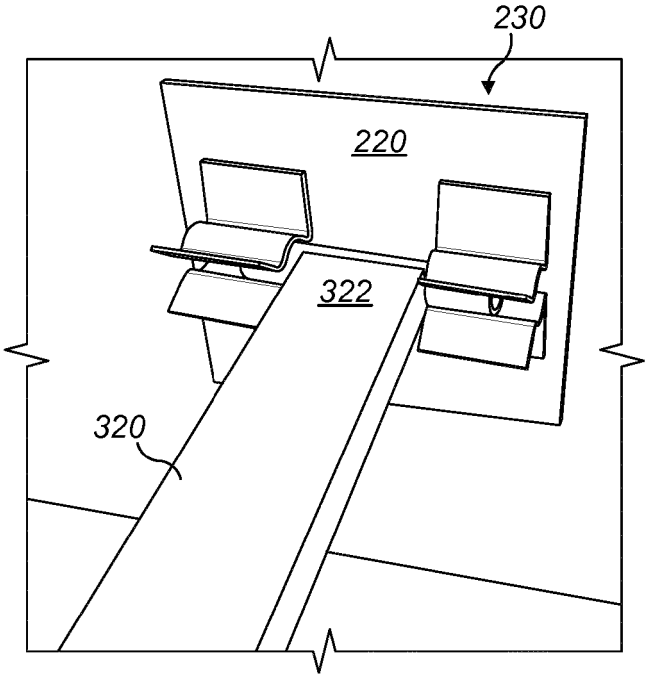

FIG. 4

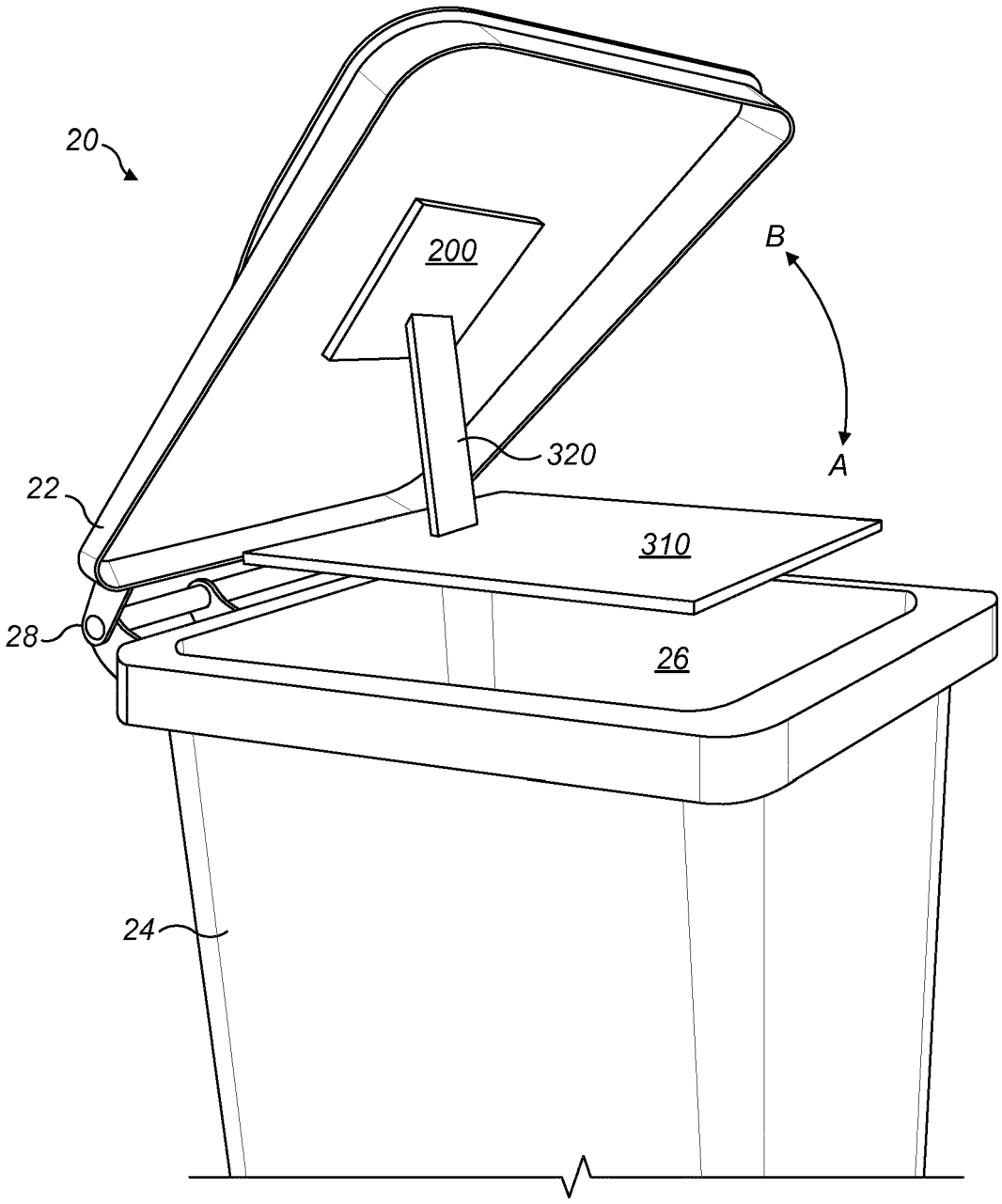

FIG. 5

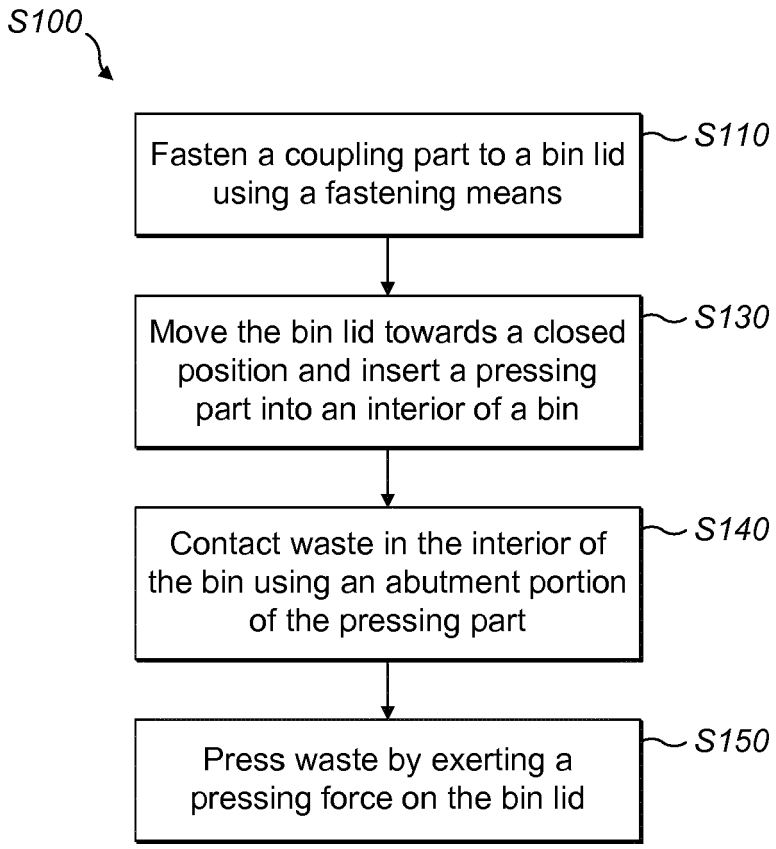
S100
Fasten a coupling part to a bin lid using a fastening means
S110
Move the bin lid towards a closed position and insert a pressing part into an interior of a bin
S130
Contact waste in the interior of the bin using an abutment portion of the pressing part
S140
Press waste by exerting a pressing force on the bin lid
S150

FIG. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 18 15 9570

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X A	US 5 263 338 A (J. BANKS) 23 November 1993 (1993-11-23) * column 2, line 18 - column 3, line 3 * * figures 1-3 *	1,4-9, 11,12,15 2,3,10, 13,14	INV. B65F1/14
X A	US 3 202 346 A (P. JACOBS) 24 August 1965 (1965-08-24) * column 2, line 19 - column 3, line 40 * * figures 1,2 *	1,4-9, 11,12,15 2,3,10, 13,14	
X	DE 196 04 302 A1 (U. KUNZMANN) 14 August 1997 (1997-08-14) * column 1, line 61 - column 2, line 20 * * figures 3a,3b,3c *	1-3,7, 11-13	
			TECHNICAL FIELDS SEARCHED (IPC) B65F B30B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	25 June 2018	Smolders, Rob

CATEGORY OF CITED DOCUMENTS

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25-06-2018

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US 5263338 A	23-11-1993	NONE	
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