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(54) **Title:** HANDHELD APPARATUS FOR SPREADING MATERIAL

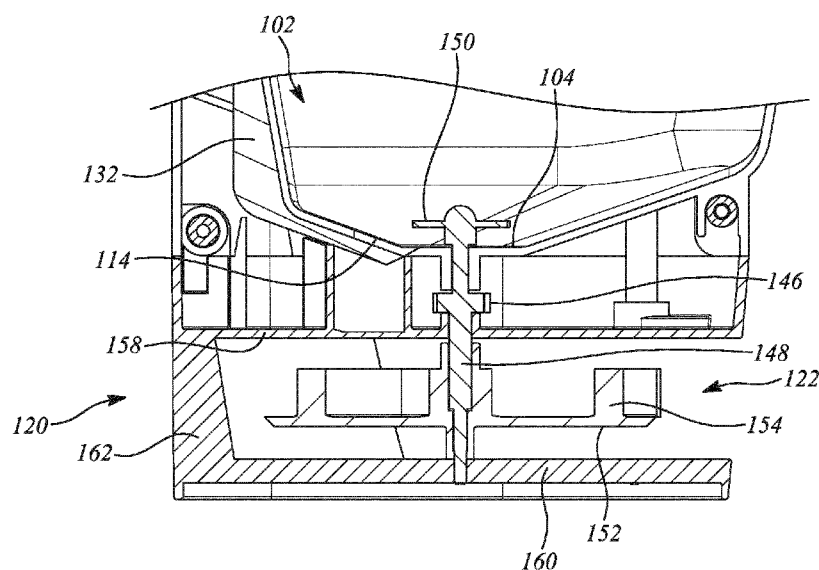


FIG. 4

(57) **Abstract:** The present invention relates a handheld apparatus (100) for spreading material. The handheld apparatus (100) includes a bucket member (102) configured to store the material, and having a closable dispensing opening (114). The handheld apparatus (100) further includes an actuating member (118) disposed on the bucket member (102), and a housing member (120) connected below the bucket member (102). The handheld apparatus (100) further includes a rotating member (122) disposed within the housing member (120) and positioned at a predefined distance from the housing member (120). The rotating member (122) is operably associated with the actuating member (118) to receive rotary movement therefrom. The predefined distance of the rotating member (122) from the housing member (120) is greater than maximum size of the material passing through the dispensing opening (114).



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HANDHELD APPARATUS FOR SPREADING MATERIALTECHNICAL FIELD

The present invention relates to a spreading apparatuses, and more particularly to a handheld apparatus for spreading materials.

5

BACKGROUND

Spreader apparatuses are generally used for spreading and distributing materials, including, but not limited to, fertilizer and seeds on surfaces like, lawns, farm land etc. A spreader apparatus typically includes a bucket member, a dispensing opening, and an actuating handle. The bucket member stores the material to be distributed. The dispensing opening is provided on a bottom side of the bucket member. The actuating handle is disposed on the bucket member to rotate a rotating member within the bucket member. Further, a housing member having a spreader plate is attached to the bucket member. Rotation of the actuating handle rotates the rotating member and the spreading spreader. Owing to such rotation of the rotating member and the spreading spreader, the material of the bucket member passes through the dispensing opening to get dispensed on the surface below the spreader apparatus. Since the spreader apparatus may be employed for spreading material having particles with varying sizes and hardness, the particles may get stuck at the housing member often between the spreader plate and the housing member. This may lead to jamming of the rotating member and stopping or hindering of flow of the material from the bucket member.

The US Patent number 3227461 (hereinafter referred as the patent '461) discloses a material spreading and broadcasting device. The material spreading and broadcasting device includes a housing that can be held with one hand and a rotatable crank mounted on the housing that can be operated by the other hand. Pellet material or the like is stored in the housing, and is deposited selectively on a rotating impeller member

that has blades for centrifugally casting the material over a dispersed area.

Therefore, in light of the foregoing, there is a need for an improved handheld spreader apparatus which can overcome one or more problems
5 stated above.

SUMMARY

In view of the above, it is an objective of the present invention to solve or at least reduce the problems discussed above. The objective is
10 at least partially achieved according to a handheld apparatus for spreading material. The handheld apparatus includes a bucket member configured to store the material, and having a closable dispensing opening. The handheld apparatus further includes an actuating member disposed on the bucket member, and a housing member connected below
15 the bucket member. The handheld apparatus furthermore includes a rotating member disposed within the housing member and positioned at a predefined distance from the housing member. The rotating member is operably associated with the actuating member to receive rotary movement therefrom. The predefined distance of the rotating member
20 from the housing member is greater than maximum size of the material passing through the dispensing opening. Since, the predetermined distance between the rotating member and the housing member is greater than the maximum size of the material passing through the dispensing opening; any likelihood of material clogging in the rotating member is
25 eliminated. Further, any likelihood of damage to the rotating member and the housing member is also eliminated.

According to an aspect of the present invention, the housing member includes a plurality of slots.

According to an aspect of the present invention, the housing
30 member includes a top wall, a bottom wall and a plurality of side walls encompassing the rotating member.

According to an aspect of the present invention, the distance between the rotating member with respect to each of the top wall, the bottom wall and the side walls is greater than the maximum size of the material. Since the distance between the rotating member and each of
5 the top wall, the bottom wall, and the side walls of the housing member is greater than the maximum size of the material, the material coming from the dispensing opening is allowed to pass therethrough.

According to an aspect of the present invention, the plurality of slots of the housing member may be defined on the bottom wall of the
10 housing member.

According to an aspect of the present invention, the plurality of slots of the housing member is defined on the bottom wall of the housing member by a set of ribs. Each slot of plurality of slots is greater in size than the maximum size of the material. Since the each slot of plurality of
15 slots may be greater in size than the maximum size of the material passing through the dispensing opening, any likelihood of material clogging in the housing member is also eliminated.

According to an aspect of the present invention, the housing member is detachably connected to the bucket member.

20 According to an aspect of the present invention, the rotating member is operably associated with the actuating member to receive rotary movement through one of a gear arrangement and a belt arrangement.

According to an aspect of the present invention, the actuating
25 member is configured to be operated manually.

According to an aspect of the present invention, the handle is mounted on the bucket member.

According to an aspect of the present invention, the handle is provided with a knob to selectively open the dispensing opening of the
30 bucket member.

According to an aspect of the present invention, a recessed handle portion is defined on the bucket member.

According to an aspect of the present invention, the bucket member is having a rectangular cross section.

According to an aspect of the present invention, the bucket member is having a circular cross section.

5 According to an aspect of the present invention, the handheld tool is configured to dispense at least one of seeds, salt, fertilizers, sand and stones.

BRIEF DESCRIPTION OF THE DRAWINGS

10 The invention will be described in more detail with reference to the enclosed drawings, wherein:

FIG. 1 shows a perspective view of a handheld apparatus, according to an embodiment of the present invention;

15 FIG. 2 shows a top view of the handheld apparatus shown in FIG. 1, according to an embodiment of the present invention;

FIG. 3 shows an exploded view of the handheld apparatus shown in FIG. 1, according to an embodiment of the present invention;

20 FIG. 4 shows a sectional view of a portion of the handheld apparatus shown in FIG. 1 along an axis **A-A'**, according to an embodiment of the present invention; and

FIG. 5 shows a bottom perspective view of the handheld apparatus shown in FIG. 1, according to an embodiment of the present invention.

DESCRIPTION OF EMBODIMENTS

25 The present invention will be described more fully hereinafter with reference to the accompanying drawings, in which example embodiments of the invention incorporating one or more aspects of the present invention are shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the
30 embodiments set forth herein; rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art. For example, one or

more aspects of the present invention can be utilized in other embodiments and even other types of structures and/or methods. In the drawings, like numbers refer to like elements. Wherever possible, the same reference numbers will be used throughout the drawings to refer to
5 the same or the like parts.

FIG. 1 illustrates a perspective view of a handheld apparatus **100**, according to an embodiment of the present invention. The handheld apparatus **100** may be used for spreading and/or distributing a material or a mixture of materials. In the present disclosure, the handheld apparatus
10 **100** is embodied as a spreader apparatus which can be used for spreading and distributing the material at a farm or a garden. The materials may include seeds, salt, fertilizers, sand and stones or any other material in a form of granules of different sizes and shapes. The granules of the material may have a minimum size and a maximum size.

The handheld apparatus **100** includes a bucket member **102** adapted to contain the material. In an example, the bucket member **102** may have a cup shape or a cylindrical shape or any other shape known in the art, to carry the material during operation of the handheld apparatus
15 **100**. In another example, the bucket member **102** may have a circular cross sectional configuration, or a rectangular cross sectional configuration, or any other cross sectional configuration/shape known in the art. The configuration of the bucket member **102** may define a predefined volume of the material that may be contained in the bucket
20 member **102**.

The bucket member **102** may include a base portion **104**, and a plurality of exterior walls, such as a first side vertical wall **106**, a second side vertical wall **108**, a front vertical wall **110**, and a back vertical wall
25 **112**. The first side vertical wall **106**, the second side vertical wall **108**, the front vertical wall **110**, and the back vertical wall **112** may be connected to each other and extend upwardly from the base portion **104**. In the disclosed embodiment, the first side vertical wall **106**, the second side
30 vertical wall **108**, the front vertical wall **110**, and the back vertical wall **112**

diverge upwardly from the base portion **104** to define an open top portion (not numbered) opposite to the base portion **104**. The material to be distributed through the handheld apparatus **100** may be filled in the bucket member **102** through the open top portion.

5 The bucket member **102** further includes a closable dispensing opening **114**, as shown in FIG. **2** which illustrates a top view of the handheld apparatus **100**. The closable dispensing opening **114**, also referred to as “dispensing opening **114**,” may be defined on the base portion **104**. The dispensing opening **114** may have a predefined size of
10 a square, rectangular, circular or any other configuration. In an example, the dispensing opening **114** may have a size bigger than the maximum size of the material contained in the bucket member **102**.

In an alternative embodiment, the bucket member **102** may include fewer or more number of walls defining the bucket member **102**. For
15 example, if the bucket member **102** has cylindrical configuration or a circular configuration, one cylindrical outer wall (not shown) may extend upwardly from the base portion **104** to define the bucket member **102**.

Referring now to FIG. **1** and **2**, the handheld apparatus **100** further includes a handle **116**, an actuating member **118**, a housing member **120**
20 and a rotating member **122**. The actuating member **118** is disposed on the bucket member **102**. The housing member **120** is connected below the bucket member **102**. The rotating member **122** is disposed within the housing member **120**. The rotating member **122** is positioned at a predefined distance from the housing member **120**. Further, the rotating
25 member **122** is operably associated with the actuating member **118** to receive rotary movement. The predefined distance of the rotating member **122** from the housing member **120** may be greater than the maximum size of the material passing through the dispensing opening **114**.

30 FIG. **3** illustrates an exploded view of the handheld apparatus **100**, according to an embodiment of the present invention. The handle **116** may be mounted on one of the exterior walls of the bucket member **102**.

In the illustrated example, the handle **116** is mounted on the back vertical wall **112** of the bucket member **102**. In alternative example, the handle **116** may be mounted on any one of the first side vertical wall **106**, the second side vertical wall **108**, and the front vertical wall **110**, of the bucket member **102**. In one embodiment, the handle **116** may be detachably mounted on the back vertical wall **112** of the bucket member **102**. Alternatively, the handle **116** may be integral to the back vertical wall **112** of the bucket member **102**.

The handle **116** may include a first portion **124** and a second portion **126**. The first portion **124** of the handle **116** may be connected to the back vertical wall **112** of the bucket member **102** and the second portion **126** extends at an inclination therefrom. The handle **116** may have a rectangular tubular cross-section and a cylindrical tubular cross-section. In another embodiment, the handle **116** may be a recessed handle portion defined on the back vertical wall **112** of the bucket member **102**. The handle **116** may enable the user to hold the handheld apparatus **100** with just one hand.

The handle **116** may be provided with a knob **128** to selectively open and close the dispensing opening **114** of the bucket member **102**. Specifically, the knob **128** is a part of a locking mechanism **130** which also includes a closure member **132** connected to the knob **128**. The locking mechanism **130** may be operated to selectively open and close the dispensing opening **114** of the bucket member **102**. In an example, actuation of the knob **128** may move the closure member **132** to conceal the dispensing opening **114** to stop the passage of the material to the dispensing opening **114**. Further, the actuation of the knob **128** may also move the closure member **132** to open the dispensing opening **114** to allow the passage of the material to the dispensing opening **114**. In the same example, a marginal actuation of the knob **128** may move the closure member **132** slightly, to partially conceal the dispensing opening **114** to allow the passage of small amount or quantity of the material through the dispensing opening **114**.

As shown in FIG. 1, 2 and 3, the actuating member **118** may be connected to the bucket member **102**. In one embodiment, the actuating member **118** may be configured to be operated manually by the user to rotate the rotating member **122**. Alternatively, the actuating member **118** may be operated electrically, may be through a motor to rotate the rotating member **122**. The actuating member **118** may be disposed on the first side vertical wall **106** of the bucket member **102**.

As illustrated, the actuating member **118** is operably associated with the rotating member **122** through a gear arrangement **134**, to receive rotary movement from the actuating member **118**. The actuating member **118** may include a lever **136** and a gripping member **138** connected to the lever **136**. The gripping member **138** may be rotated, to rotate the lever **136** for providing a rotatory movement to the rotating member **122**.

The gear arrangement **134** includes a bevel gear **140**, a bevel pinion **142**, a gear **144**, a pinion **146**, a vertically extending drive shaft **148**, and an impeller **150**. The lever **136** of the actuating member **118** is connected to the bevel gear **140**, through a clipping member **143**. The bevel gear **140** is disposed behind the first side vertical wall **106**. The bevel gear **140** is in meshing engagement with the bevel pinion **142** and drives the bevel pinion **142**. The bevel pinion **142** is integral to the gear **144**. Therefore, the gear **144** rotates with rotation of the bevel pinion **142**. Further, the gear **144** is in meshing engagement with the pinion **146** which is mounted on the vertically extending drive shaft **148**. The impeller **150** is also mounted on the vertically extending drive shaft **148**. Furthermore, the rotating member **122** is also mounted on the vertically extending drive shaft **148**.

In an embodiment, the rotating member **122** may be operably associated with the actuating member **118** through a belt arrangement (not illustrated), to receive rotary movement from the actuating member **118**. In alternative embodiments, the rotating member **122** may be operably associated with the actuating member **118** through any other mechanical arrangement known in the art.

As illustrated, the rotating member **122** may include a plate portion **152** and a plurality of blades **154** extending outwardly from the plate portion **152**. The blades **154** may have a curved profile. In alternative embodiments, the blades **154** may have a straight, or any other profile.

5 The blades **154** have a predetermined height from the plate portion **152**. Although the illustrations show four blades **154**, the rotating member **122**, in alternative embodiments, may include fewer or more number of blades, such as the blades **154**.

Referring now to FIG. 4 which shows a sectional view of a portion
10 of the handheld apparatus **100** shown in FIG. 1 along an axis **A-A**, and FIG. 5 which shows a bottom perspective view of the handheld apparatus **100**. The housing member **120** may be mounted to the base portion **104** of the bucket member **102**. The housing member **120** may be detachably connected to the base portion **104** of the bucket member **102** through a
15 plurality of bolts **156** (shown in FIG. 3). Alternatively, the housing member **120** may be detachably connected to the base portion **104** of the bucket member **102** through any other means.

The housing member **120** includes a top wall **158**, a bottom wall **160** below the top wall **158**, and a plurality of side walls **162** connecting
20 the top wall **158** and the bottom wall **160**. As discussed earlier, the rotating member **122** is disposed within the housing member **120**. The rotating member **122** is disposed within the housing member **120** such that the top wall **158**, the bottom wall **160**, and a plurality of side walls **162** encompass the rotating member **122**. A predetermined distance is
25 provided between the rotating member **122** and each of the top wall **158**, the bottom wall **160** and the side walls **162**. The predetermined distance between the rotating member **122** with respect to each of the top wall **158**, the bottom wall **160** and the side walls **162** is greater than the maximum size of the material.

30 Further, the housing member **120** includes a plurality of slots **164**. The plurality of slots **164** may be defined on the bottom wall **160** of the housing member **120**. The slots **164** are positioned below the rotating

member **122**. Each slot of the plurality of slots **164** may be greater in size than the maximum size of the material. The plurality of slots **164** of the housing member **120** may be defined, on the bottom wall **160** of the housing member **120**, by a set of ribs **166**. The set of ribs **166** extend
5 radially outwardly from a center of the bottom wall **160**, to define the slots **164**.

During utilisation of the handheld apparatus **100** filled with the material having granules varying from the minimum size to the maximum size in the bucket member **102**, the lever **136** of the actuating member
10 **118** is rotated. When the lever **136** is rotated, the bevel gear **140** rotates, and the bevel pinion **142** in meshing arrangement with the bevel gear **140** also rotates. The bevel pinion **142** rotates the gear **144** which rotates the pinion **146**. The vertically extending drive shaft **148** rotates with the pinion **146**. Further, since the impeller **150** and the rotating member **122** are
15 mounted on the vertically extending drive shaft **148**, rotation of the vertically extending drive shaft **148** also rotates the impeller **150** and the rotating member **122**. Due to such rotation of the impeller **150**, the material contained in the bucket member **102** is agitated and induced to move.

20 The material contained in the bucket member **102** flows through the dispensing opening **114** towards the housing member **120**. The rotating member **122**, positioned within the housing member **120**, also rotates with the vertically extending drive shaft **148**. Further, the material passes through a gap (the predetermined distance) between the rotating
25 member **122** and the top wall **158**, the bottom wall **160**, and a plurality of side walls **162** of the housing member **120**. Owing to the predetermined distance between the rotating member **122** and each of the top wall **158**, the bottom wall **160**, and a plurality of side walls **162** of the housing member **120**, the material coming from the dispensing opening **114** is
30 allowed to pass therethrough. Since the predetermined distance between the rotating member **122** and the housing member **120** is greater than the maximum size of the material passing through the dispensing opening

114, any likelihood of material clogging in the rotating member **122** is eliminated. Further, any likelihood of damage to the rotating member **122** and the housing member **120** is also eliminated.

5 Subsequently, the material is allowed to pass through the plurality of slots **164** of the housing member **120**. Since the each slot of plurality of slots **164** may be greater in size than the maximum size of the material passing through the dispensing opening **114**, any likelihood of material clogging in the housing member **120** is also eliminated.

10 In the drawings and specification, there have been disclosed preferred embodiments and examples of the invention and, although specific terms are employed, they are used in a generic and descriptive sense only and not for the purpose of limitation of the scope of the invention being set forth in the following claims.

LIST OF REFERENCE NUMERALS

	100	Handheld Apparatus
	102	Bucket Member
	104	Base Portion
5	106	First Side Vertical Wall
	108	Second Side Vertical Wall
	110	Front Vertical Wall
	112	Back Vertical Wall
	114	Dispensing Opening
10	116	Handle
	118	Actuating Member
	120	Housing Member
	122	Rotating Member
	124	First Portion
15	126	Second Portion
	128	Knob
	130	Locking Mechanism
	132	Closure Member
	134	Gear Arrangement
20	136	Lever
	138	Gripping Member
	140	Bevel Gear
	142	Bevel Pinion
	143	Clipping Member
25	144	Gear
	146	Pinion
	148	Vertically Extending Drive Shaft
	150	Impeller
	152	Plate Portion
30	154	Blades
	156	Bolts
	158	Top Wall

- 160 Bottom Wall
- 162 Side Walls
- 164 Slots
- 166 Ribs

5

CLAIMS

1. A handheld apparatus (100) for spreading material, the handheld apparatus (100) comprising:
 - a bucket member (102) configured to store the material, and having
 - 5 a closable dispensing opening (114);
 - an actuating member (118) disposed on the bucket member (102);
 - a housing member (120) connected below the bucket member (102);
 - a rotating member (122) disposed within the housing member (120)
 - 10 and positioned at a predefined distance from the housing member (120), wherein the rotating member (122) is operably associated with the actuating member (118) to receive rotary movement therefrom;

characterised in that

 - the predefined distance of the rotating member (122) from the
 - 15 housing member (120) is greater than maximum size of the material passing through the dispensing opening (114).
2. The handheld apparatus (100) according to claim 1, wherein the housing member (120) has a plurality of slots (164).
- 20
3. The handheld apparatus (100) according to claim 1, wherein the housing member (120) includes a top wall (158), a bottom wall (160) and a plurality of side wall (162) encompassing the rotating member (122).
- 25
4. The handheld apparatus (100) according to claim 1 and 3, wherein the distance between the rotating member (122) with respect to each of the top wall (158), the bottom wall (160) and the side walls (162) is greater than the maximum size of the material.
- 30

5. The handheld apparatus (100) according to claim 2, wherein the plurality of slots (164) of the housing member (120) are defined on the bottom wall (160) of the housing member (120).
- 5 6. The handheld apparatus (100) according to claim 5, wherein the plurality of slots (164) of the housing member (120) are defined on the bottom wall (160) of the housing member (120) by a set of ribs (166), wherein the each slot of plurality of slots (164) is greater in size than the maximum size of the material.
- 10 7. The handheld apparatus (100) according to claim 1, wherein the housing member (120) is detachably connected to the bucket member (102).
- 15 8. The handheld apparatus (100) according to claim 1, wherein the rotating member (122) is operably associated with the actuating member (118) to receive rotary movement through one of a gear arrangement (134) and a belt arrangement.
- 20 9. The handheld apparatus (100) according to claim 1, wherein the actuating member (118) is configured to be operated manually.
- 10.The handheld apparatus (100) according to claim 1, wherein a handle (116) is mounted on the bucket member (102).
- 25 11.The handheld apparatus (100) according to claim 9, wherein the handle (116) is provided with a knob (128) to selectively open the dispensing opening (114) of the bucket member (102).
- 30 12.The handheld apparatus (100) according to claim 1, wherein a recessed handle portion is defined on the bucket member (102).

13. The handheld apparatus (100) according to any of the preceding claims, wherein the bucket member (102) is having a rectangular cross section.
- 5 14. The handheld apparatus (100) according to any of the preceding claims, wherein the bucket member (102) is having a circular cross section.
- 10 15. The handheld apparatus (100) according to any of the preceding claims is configured to dispense at least one of seeds, salt, fertilizers, sand and stones.

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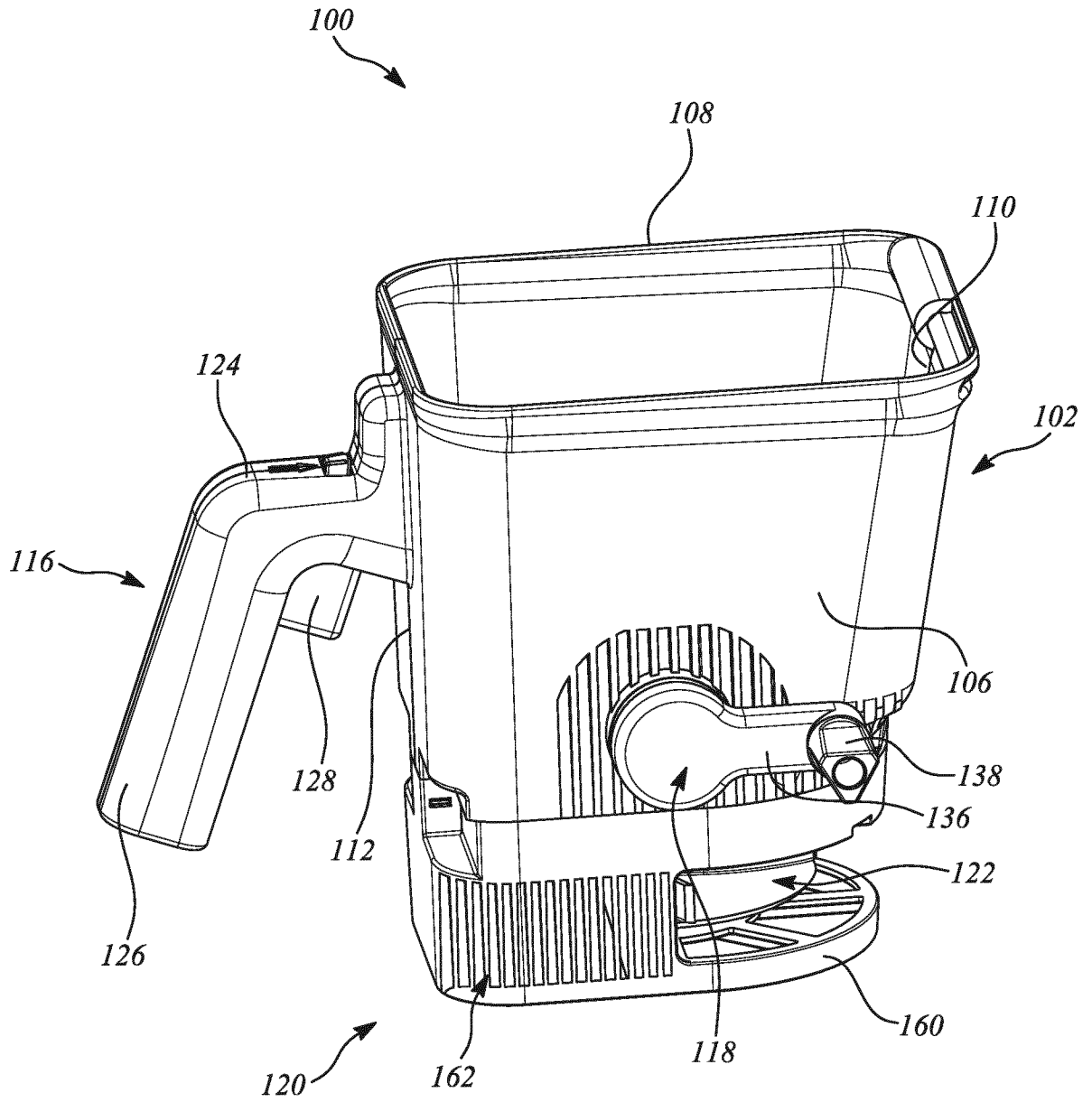


FIG. 1

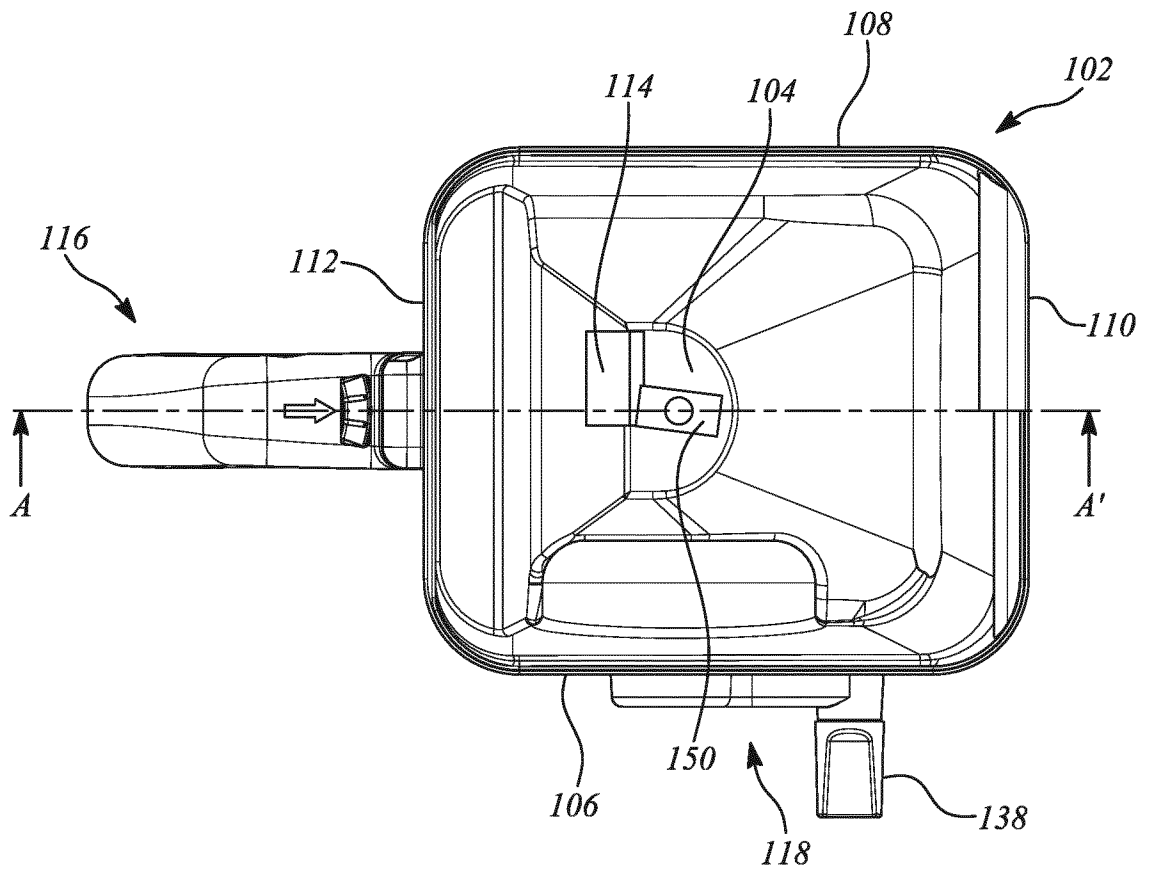


FIG. 2

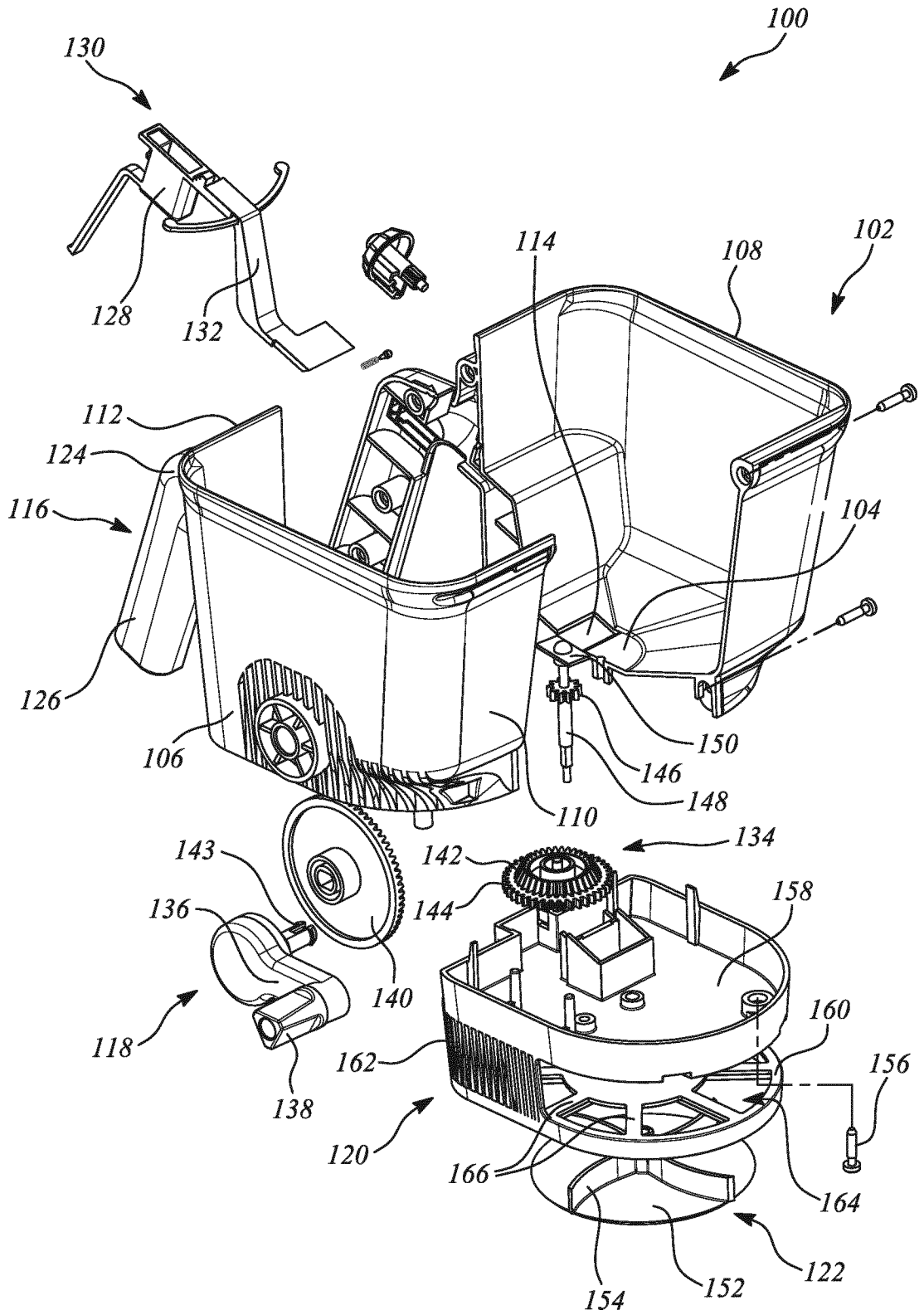


FIG. 3

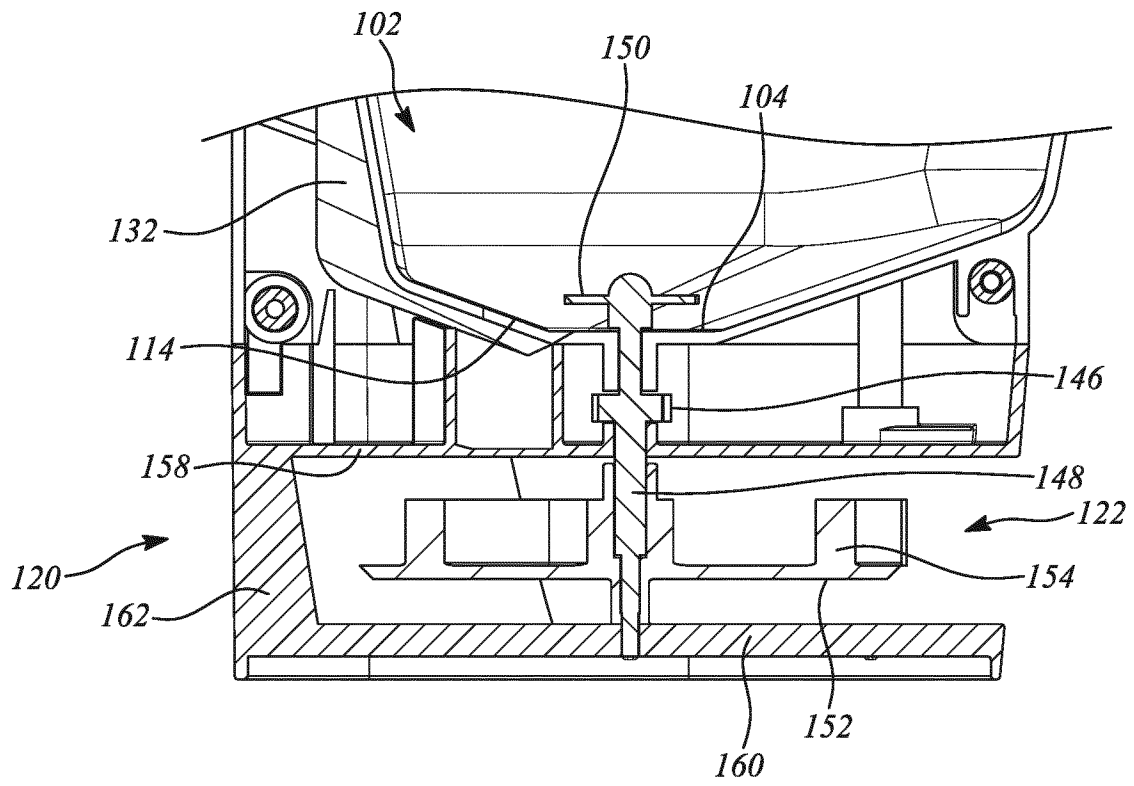


FIG. 4

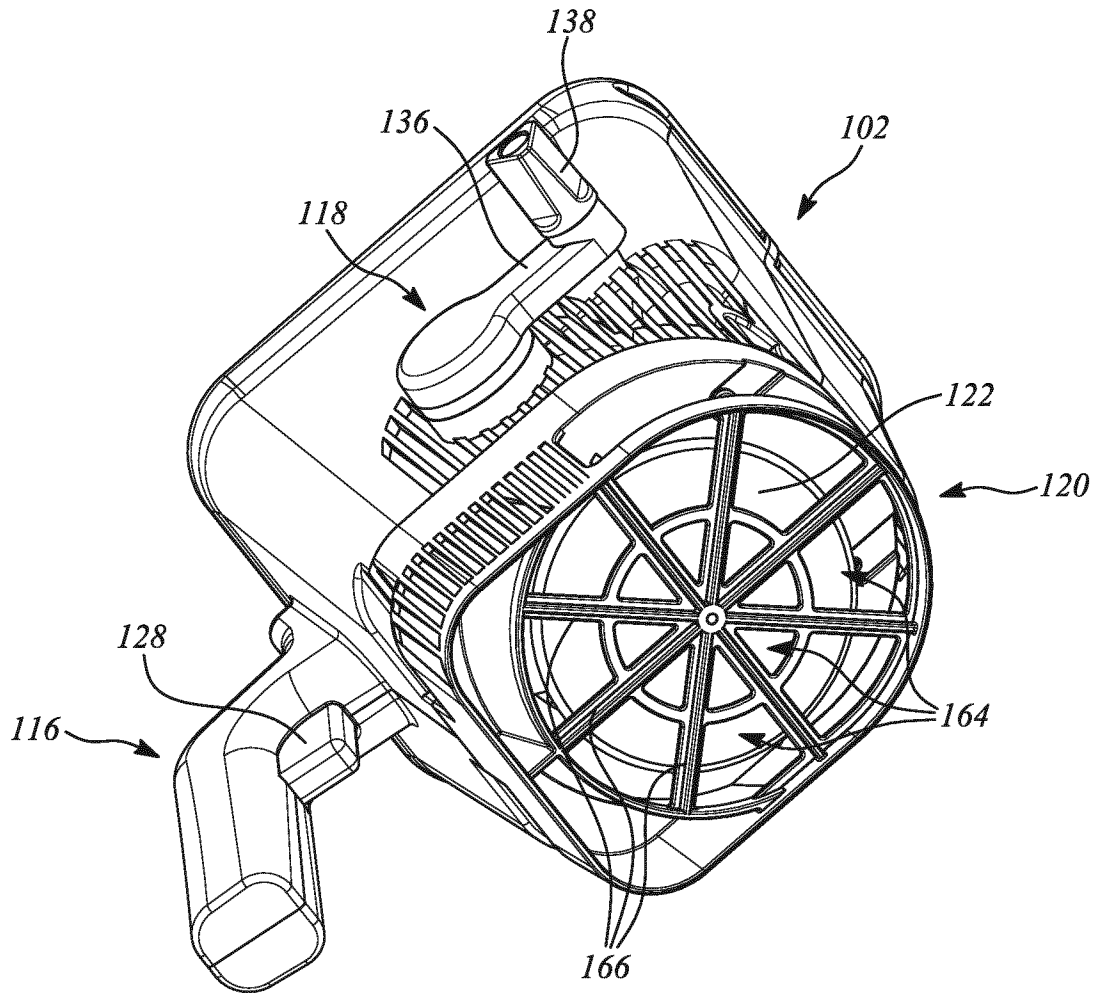


FIG. 5

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2017/059666

A. CLASSIFICATION OF SUBJECT MATTER
INV. A01C7/02 A01C15/02
ADD. E01C19/20

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A01C E01C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3 227 461 A (LOVE JR WILLIAM D) 4 January 1966 (1966-01-04) cited in the application	1,3,4, 7-11,13, 15
Y	figures 1-8 column 1, line 70 - column 2, line 31 column 3, lines 11-54 column 4, lines 15-23,34-36	1-15
X	WO 92/02120 A1 (SCOTT & SONS CO O M [US]) 20 February 1992 (1992-02-20)	1,3,4, 8-11,14, 15
Y	page 9 - page 11, line 24 figures 1-6	1-12,14, 15
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Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

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Date of the actual completion of the international search 12 July 2017	Date of mailing of the international search report 19/07/2017
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Reininghaus, F
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INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2017/059666

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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