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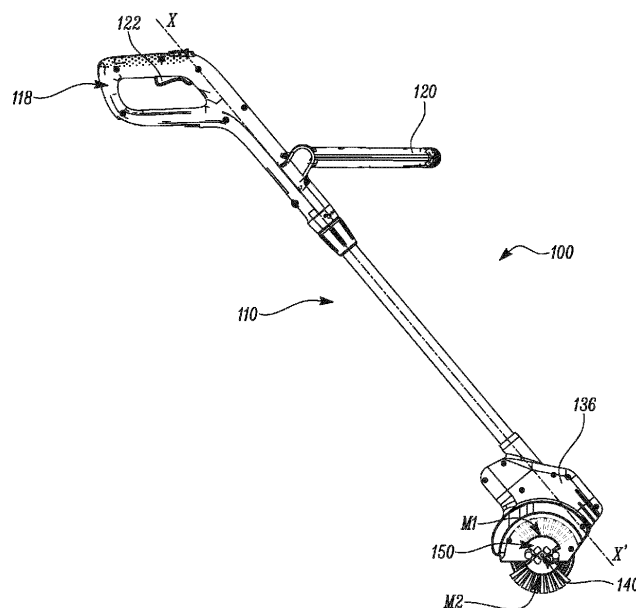
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(54) A CLEANING DEVICE

(57) An ambient surface cleaning device (100) includes a handle (110), and a driving mechanism (130). The driving mechanism (130) is operatively coupled to the handle (110). The driving mechanism (130) includes an electric motor (132), and a gear arrangement (134) operatively coupled to each other. The ambient surface

cleaning device (100) further includes a brushing device (150). The brushing device (150) is driven by the driving mechanism (130). The ambient surface cleaning device (100) is characterized in that the brushing device (150) is driven by the driving mechanism (130) in an oscillating manner.

**FIG. 2**

Description

TECHNICAL FIELD

[0001] The present disclosure relates to a cleaning device, and more particularly to a hand guided cleaning device.

BACKGROUND

[0002] A hand guided cleaning device may be useful in cleaning of a surface such as, a ground surface, a wall surface, a joint, or any other surface surrounding a user of the cleaning device. The cleaning device may include a brushing device that may be of disc type, or roller type, and may further include a plurality of plastic bristles, or stainless-steel bristles, or any other type of bristles for cleaning the surface.

[0003] However, using the cleaning device with only one kind of brushing device may not be apt, as different cleaning surfaces may have different physical characteristics and may require different brushing devices for cleaning respectively. For example, the brushing device of one kind may be suitable for cleaning a particular cleaning surface but the same kind of brushing device may cause scratches on some other cleaning surface or may not be feasible for thorough cleaning of some other cleaning surface. Further, it may not be cost-effective, and ergonomic to carry and store different cleaning devices having different brushing devices for different cleaning surfaces. Hence, an improved cleaning device may be required that may be effectively used for cleaning many different surfaces.

[0004] An example of an improved cleaning device is provided in German Utility Model DE 202,014,011,477 U1 (hereinafter referred to as '477 reference). The '477 reference provides a handheld floor cleaning device that allows to attach two types of different brushes, i.e., a roller brush and a disc brush. The roller brush is for cleaning surfaces while the disc brush is used for cleaning joints.

SUMMARY OF THE INVENTION

[0005] In view of the above, it is an objective of the present invention to solve or at least reduce the drawbacks discussed above. The objective is at least partially achieved by an ambient surface cleaning device.

[0006] According to an aspect of the present invention, the ambient surface cleaning device includes a handle, and a driving mechanism. The driving mechanism is operatively coupled to the handle. The driving mechanism includes an electric motor, and a gear arrangement operatively coupled to each other. The ambient surface cleaning device further includes a brushing device. The brushing device is driven by the driving mechanism. The ambient surface cleaning device is characterized in that the brushing device is driven in an oscillating manner.

[0007] Thus, the present disclosure provides an im-

proved ambient surface cleaning device which may be portable, hand-guided, or autonomous, and may be versatile enough to cater to cleaning of at least two surfaces of different physical characteristics. The at least two surfaces of different cleaning characteristics may be any surface surrounding a user of the ambient surface cleaning device. For example, the surface may be a joint surface, a walkway panel with flat structure, a coarse walkway panels (washing concrete panels) paving stones, a granite stoneware, tiles, or any other surface. The ambient surface cleaning device may advantageously be able to employ two different kinds of brushing devices, or two similar brushing devices with multiple cleaning characteristics simultaneously or alternately. The ambient surface cleaning device may be ergonomic in use, simple in design, and cost-effective. Further, the ambient surface cleaning device may be much more convenient to carry and store as opposed to carrying and storing a plurality of cleaning devices for cleaning a plurality of different surfaces having different physical and cleaning characteristics. Further, the oscillatory movement of the brushing device of the ambient surface cleaning device may result in a low centrifugal force acting on dirt particles, and hence the dirt particles may be thrown less far away from the ambient surface cleaning device. Hence, the user and the environment may be less polluted by the dirt particles.

[0008] The ambient surface cleaning device according to the present invention may denote that the cleaning device is capable of cleaning surfaces which are ambient to the user. In other words, the cleaning device is capable of cleaning surfaces which surround the user. The cleaning device is used for non-medical cleaning purposes.

[0009] According to an exemplary embodiment of the invention, the brushing device is a disc brush. The disc brush may preferably be used for smaller cleaning surfaces such as joints of natural stone or concrete surfaces, amongst many other surfaces.

[0010] According to an exemplary embodiment of the invention, the disc brush may have a width in the range 1 mm to 20 mm, preferably 2 mm to 10 mm and may essentially correspond to the width of the joints in the case of a floor, for example a tile floor, or in the outer region of a paved surface.

[0011] According to an exemplary embodiment of the invention, the brushing device is a roller brush. The roller brush may also be referred to as a cylindrical brush. The roller brush may be highly versatile and adaptable because there may be many variations in bristle patterns with the most common bristle patterns being straight, spiral or helix, staggered, and herringbone. The roller brush may be suitable for wider cleaning surfaces.

[0012] According to an exemplary embodiment of the invention, the brushing device is divided into multiple segments with at least two segments exhibiting different cleaning characteristics. Further, the multiple segments of the brushing device may be any number of segments and may further include different types of bristles to

exhibit different cleaning characteristics. For example, the material, and/or the dimensions of the bristles may be different for multiple segments of the brushing device. Further, at least one segment from the multiple segments may include any other cleaning tool different from the bristle. Further, the user may conveniently be able to selectively switch between multiple segments of the brushing device for carrying out cleaning operation on at least two surfaces of different cleaning characteristics.

[0013] According to an exemplary embodiment of the invention, the brushing device includes at least one plastic bristle, and/or at least one metal bristle, and/or at least one rake. The brushing device may include different sets or segments of bristles with different dimensions and materials to cater to cleaning needs of different surfaces. For example, the brushing device may include at least one plastic bristle and at least one metal bristle, or the brushing device may include only the plastic bristles of different dimensions. Further, the brushing device may also include at least one rake, or any other cleaning tool for cleaning surfaces or weeding. The brushing device may be a multi-purpose brushing device with many different cleaning characteristics that may alternatively be used for cleaning surfaces as per the requirements of the surfaces.

[0014] According to an exemplary embodiment of the invention, the brushing device may include at least one plastic bristle, and/or at least one metal bristle with a bristle diameter in the range of 0.5 to 1 mm depending on the physical characteristics of the surface to be cleaned. For example, the bristle diameter of 0.5 mm may be suitable for coarse pavement, fine paving, and stone-ware. Further, the width of the brushing device with bristles may vary from 20 to 250 mm, preferably 50 to 150 mm.

[0015] According to an exemplary embodiment of the invention, the driving mechanism is operatively coupled to the brushing device via an axle. The axle may be a shaft configured for providing oscillating motion to the brushing device mounted to the axle by transferring the motion imparted by the driving mechanism to the brushing device mounted to the axle.

[0016] According to an exemplary embodiment of the invention, the axle has a first end and a second end, such that the brushing device is operatively mounted to at least one of the first end and the second end. The brushing device may be mounted to the axle in a manner such that a left-handed user or a right-handed user may be able to use the ambient surface cleaning device conveniently and ergonomically using the dominant hand.

[0017] According to an exemplary embodiment of the invention, two-disc brushes may be mounted to the first end and the second end of the axle respectively. According to an exemplary embodiment of the invention, two roller brushes may be mounted to the first end and the second end of the axle respectively. According to an exemplary embodiment of the invention, the disc brush may be mounted to the first end of the axle and the roller

brush may be mounted to the second end of the axle. Alternatively, the roller brush may be mounted to the first end of the axle and the disc brush may be mounted to the second end of the axle. The usage of more than one similar or dissimilar brushing device may be advantageous for cleaning different types of adjacent surfaces together or cleaning a larger portion of one surface at once, thereby saving time and effort for the user.

[0018] According to an exemplary embodiment of the invention, a support wheel is operatively mounted to one of the first end and the second end of the axle. When the brushing device may be mounted on one of the first end and the second end of the axle, then the support wheel may be mounted to a free end of the axle, i.e., one of the first end and the second end of the axle to which the brushing device may not be mounted. The support wheel may guide and support the ambient surface cleaning device securely on the surface to be cleaned.

[0019] According to an exemplary embodiment of the invention, the brushing device and/or the support wheel is operatively mounted to the axle in a removable manner. The removable mounting of the brushing device and/or the support wheel may enable easy exchange of the brushing device and/or the support wheel as per requirement. For example, the disc brush may be exchanged with the roller brush, or the roller brush may be exchanged with the support wheel, or the support wheel may be exchanged with the disc brush as per requirement. Further, a broken brushing device may be replaced with a new brushing device.

[0020] According to an exemplary embodiment of the invention, the brushing device and/or the support wheel is removed without using any tool. The tool less removal or exchange of the brushing device and/or the support wheel may allow easy removal or exchange of the brushing device and/or the support wheel by any user not necessarily skilled in the art.

[0021] According to an exemplary embodiment of the invention, the driving mechanism is housed in a driving mechanism housing such that the driving mechanism housing is removably coupled to a plurality of protective hoods, wherein the plurality of protective hoods at least partially shields the brushing device and/or the support wheel. The protective hood may prevent dirt from falling on the user of the ambient surface cleaning device. Further, the protective hood may also prevent inadvertent accidents due to falling of broken bristles, or other cleaning tools attached to the brushing device on the user.

[0022] According to an exemplary embodiment of the invention, the handle is telescopic. The handle may allow manual guidance of the ambient surface cleaning device along the surface to be cleaned. The handle may be telescopic to adapt to the height of the user. The handle may allow the user to clean the surface in an ergonomic manner. The handle may allow the user to stand in a normal comfortable position and simultaneously clean the surface. The handle may be designed as a metal or plastic tube.

[0023] According to an exemplary embodiment of the invention, the handle includes at least two gripping zones. The gripping zones may provide different gripping positions to the user as per the convenience of the user, which may reduce fatigue of the user.

[0024] According to an exemplary embodiment of the invention, the handle includes a power switch to operate the ambient surface cleaning device. The handle may include the power switch or button to start and end the operation of the ambient surface cleaning device. Further, the handle may shield the wirings connecting the power switch and the electric motor. Further, the handle may accommodate a battery to power the electric motor.

[0025] According to an exemplary embodiment of the invention, an axis of rotation of the axle and an axis of the electric motor are neither parallel nor intersecting. This may lead to a compact design of the ambient surface cleaning device.

[0026] Before discussing the invention with the help of the drawings the invention will be briefly discussed in general. An ambient surface cleaning device for grout and lawn edge care may be provided with interchangeable brushing devices. The brushing devices may include metal or plastic bristles, or metal or plastic discs. The ambient surface cleaning device may be driven by a motor with a gearbox such that the brushing devices of the ambient surface cleaning device may exhibit an oscillating motion. The brushing devices may be mounted on both sides of an axle provided with the ambient surface cleaning device. The brushing devices may be mounted tool-less to the axle of the ambient surface cleaning device in order to clean joints, or other surfaces.

[0027] The ambient surface cleaning device according to the present invention may provide oscillating motion to the brushing devices. This may result in lower centrifugal force acting on dirt particles. The lower centrifugal force may prevent the dirt particles from being thrown far away from the ambient surface cleaning device. This may further imply that the brushing devices may not have to be encapsulated as much as the brushing devices with rotary motion are encapsulated. Further, this may advantageously allow smaller protective hoods, which may further allow better view of the surface to be cleaned. Further, the user and the environment may be less polluted by the dirt particles.

[0028] The ambient surface cleaning device according to the present invention may allow relocation of the brushing devices from first end of the axle to the second end of the axle and vice-versa, thereby allowing the user to optimally adapt the ambient surface cleaning device to the work task depending on the preference of the user or work task. Further, this may ensure, for example, cleaning of edges on walls or buildings from both directions. Further, the user may be able to set up the ambient surface cleaning device in a manner convenient for the user, depending on the preference of the user (left or

right-handed).

[0029] The ambient surface cleaning device according to the present invention may allow other cleaning tools to be used other than the brushing devices with bristles. For example, discs for tilling lawns, or tools for tilling soil may be mounted on the axle of the ambient surface cleaning device. The ambient surface cleaning device according to the present invention may allow division of the brushing devices into several blessings (or bristles) of different cleaning characteristics in order to be able perform surface cleaning operations on at least two different kinds of surfaces without having to change the brushing devices.

[0030] According to an exemplary embodiment of the invention, the ambient surface cleaning device for grout and lawn edge care may be provided with interchangeable brushing devices. The brushing devices may include metal or plastic bristles, or metal or plastic discs. The ambient surface cleaning device may be driven by the motor with the gearbox such that the brushing devices of the ambient surface cleaning device may exhibit the oscillating motion. The brushing devices may be mounted tool-less on both sides of the axle provided with the ambient surface cleaning device to clean joints, or other surfaces. Further, for the ambient cleaning surface device with oscillating brushing devices, the brushing devices may be divided into several blessings (or bristles) of different cleaning characteristics in order to be able perform surface cleaning operations on at least two different kinds of surfaces without having to change the brushing devices already mounted on the axle provided with the ambient surface cleaning device.

[0031] Other features and aspects of this invention will be apparent from the following description and the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0032] The invention will be described in more detail with reference to the enclosed drawings, wherein:

FIG. 1 illustrates a side view of an ambient surface cleaning device with a disc brush, in accordance with an exemplary embodiment of the present disclosure;

FIG. 2 illustrates another side view of an ambient surface cleaning device with a disc brush, in accordance with an exemplary embodiment of the present disclosure;

FIG. 3 illustrates a back view of an ambient surface cleaning device with a roller brush, in accordance with an exemplary embodiment of the present disclosure; and

FIG. 4 illustrates another back view of an ambient surface cleaning device with a roller brush, in accordance with an exemplary embodiment of the present disclosure.

DETAILED DESCRIPTION OF THE DRAWINGS

[0033] 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 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 may be utilized in other embodiments and even other types of structures and/or methods. In the drawings, like numbers refer to like elements.

[0034] Certain terminology is used herein for convenience only and is not to be taken as a limitation on the invention. For example, "upper", "lower", "front", "rear", "side", "longitudinal", "lateral", "transverse", "upwards", "downwards", "forward", "backward", "sideward", "left", "right", "horizontal", "vertical", "upward", "inner", "outer", "inward", "outward", "top", "bottom", "higher", "above", "below", "central", "middle", "intermediate", "between", "end", "adjacent", "proximate", "near", "distal", "remote", "radial", "circumferential", or the like, merely describe the configuration shown in the Figures. Indeed, the components may be oriented in any direction and the terminology, therefore, should be understood as encompassing such variations unless specified otherwise.

[0035] FIG. 1 illustrates an ambient surface cleaning device 100. The ambient surface cleaning device 100 is defined along a central axis $X-X'$ such that the central axis $X-X'$ when viewed in a direction along an arrow "A" divides the ambient surface cleaning device 100 into two symmetrical halves. The ambient surface cleaning device 100 includes a handle 110. The handle 110 includes a first part 112 and a second part 114. The first part 112 is slidable relative to the second part 114 along the central axis $X-X'$. In other words, the handle 110 is telescopic. The first part 112 is locked in a desired ergonomic position relative to the second part 114 along the central axis $X-X'$ by virtue of a rotatable sleeve 116. In other words, the first part 112 is locked and unlocked to the desired position relative to the second part 114 by rotation of the sleeve 116 in a clockwise and an anticlockwise direction respectively.

[0036] The handle 110 further includes at least two gripping zones 118, 120. The gripping zone 118 is disposed higher on the first part 112 of the handle 110 relative to the gripping zone 120. In other words, the at least two gripping zones 118, 120 are disposed at different positions along the central axis $X-X'$. The handle 110 further includes a power switch 122 to operate the ambient surface cleaning device 100. The power switch 122 is included in the gripping zone 118 of the first part 112 of the handle 110.

[0037] With continuous reference to FIG. 1, the ambi-

ent surface cleaning device 100 includes a driving mechanism 130. The driving mechanism 130 is operatively coupled to the handle 110 at a location proximate to a lower end of the handle 110. The driving mechanism 130 includes an electric motor 132, and a gear arrangement 134 operatively coupled to each other. The driving mechanism 130 is turned ON/OFF using the power switch 122.

[0038] The driving mechanism 130 is housed in a driving mechanism housing 136. In other words, the driving mechanism housing 136 shields the driving mechanism 130 from the surrounding environment. The driving mechanism housing 136 is coupled to the handle 110 at the location proximate to the lower end of the handle 110. The driving mechanism housing 136 is removably coupled to a plurality of protective hoods 138. The plurality of protective hoods 138 in the present invention are exemplified as two protective hoods 138.

[0039] The driving mechanism housing 136 further houses an axle 140. The axle 140 is operatively coupled to the driving mechanism 130. An axis $Y-Y'$ of rotation of the axle 140 and an axis $Z-Z'$ of the electric motor 132 are neither parallel nor intersecting. The axle 140 mounts a brushing device 150 and/ or a support wheel 160 in a removable manner such that the brushing device 150 and/ or the support wheel 160 is removed from the axle 140 without using any tool. Further, the plurality of protective hoods 138 or the two protective hoods 138 respectively shields the brushing device 150 and/ or the support wheel 160.

[0040] FIG. 2 illustrates a side view of an ambient surface cleaning device 100 with the driving mechanism 130 shielded by the driving mechanism housing 136. The ambient surface cleaning device 100 includes the brushing device 150 mounted on the axle 140. The brushing device 150 is operatively coupled to the driving mechanism 130 via the axle 140 such that the brushing device 150 is driven by the driving mechanism 130 in an oscillating manner.

[0041] The brushing device 150 illustrated in FIG. 2 is a disc brush. The brushing device 150 is divided into multiple segments "M1, M2" with at least two segments exhibiting different cleaning characteristics. Further, the brushing device 150 includes at least one plastic bristle, and/ or at least one metal bristle, and/ or at least one rake. The brushing device 150 in FIG. 1 is exemplary divided into two segments "M1, M2" such that the two segments "M1, M2" exhibit different cleaning characteristics. The segment "M1" includes at least one plastic bristle and the segment "M2" includes at least one metal bristle such that the at least one plastic bristle is a plurality of plastic bristles and the at least one metal bristle is a plurality of metal bristles. Further, one of the two segments "M1, M2" is employed at a time depending on the surface to be cleaned. For example, when the surface requires cleaning by segment "M1" then the segment "M1" is employed for cleaning the surface and the segment "M2" is left idle. Further, when some other surface requires cleaning by

segment "M2" then the segment "M2" is employed for cleaning the surface and the segment "M1" is left idle. The brushing device 150 is shifted from the segment "M1" to the segment "M2" and vice-versa as per requirement by any means without departing from the spirit of the present invention.

[0042] FIG. 3 illustrates a back view of the ambient surface cleaning device 100. The ambient surface cleaning device 100 includes the brushing device 150. The brushing device 150 illustrated in FIG. 3 is a roller brush. The brushing device 150 is driven the driving mechanism 130 in the oscillating manner. The driving mechanism 130 is housed in the driving mechanism housing 136. The driving mechanism housing 136 also houses the axle 140 such that the driving mechanism 130 is operatively coupled to the brushing device 150 via the axle 140. The axle 140 rotates about the axis Y-Y'.

[0043] The axle 140 has a first end 142 and a second end 144 such that the brushing device 150 is operatively mounted to at least one of the first end 142 and the second end 144. Further, the support wheel 160 is operatively mounted to one of the first end 142 and the second end 144 of the axle 140. The brushing device 150 is exemplary mounted to the first end 142 and the support wheel 160 is operatively mounted to the second end 144. The brushing device 150 and/ or the support wheel 160 is operatively mounted to the axle 140 in a removable manner such that the brushing device 150 and/ or the support wheel 160 is removed without using any tool.

[0044] FIG. 4 illustrates another back view of the ambient surface cleaning device 100 with the roller brush as the brushing device 150. The brushing device 150 is divided into multiple segments "M1, M2" with at least two segments exhibiting different cleaning characteristics. Further, the brushing device 150 includes at least one plastic bristle, and/ or at least one metal bristle, and/ or at least one rake.

[0045] The brushing device 150 in FIG. 4 is exemplary divided into two segments "M1, M2" such that the two segments "M1, M2" exhibit different cleaning characteristics. The segment "M1" includes at least one plastic bristle and the segment "M2" includes at least one metal bristle such that the at least one plastic bristle is a plurality of plastic bristles and the at least one metal bristle is a plurality of metal bristles. Further, one of the two segments "M1, M2" is employed at a time depending on the surface to be cleaned. For example, when the surface requires cleaning by segment "M1" then the segment "M1" is employed for cleaning the surface and the segment "M2" is left idle. Further, when some other surface requires cleaning by segment "M2" then the segment "M2" is employed for cleaning the surface and the segment "M1" is left idle. The brushing device 150 is shifted from the segment "M1" to the segment "M2" and vice-versa as per requirement by any means without departing from the spirit of the present invention.

[0046] The ambient surface cleaning device 100 alternatively employs the disc brush and the roller brush as

per the requirement of the surface. The disc brush is removable from the axle 140 in a tool less manner to removably mount the roller brush on the axle 140. Similarly, the roller brush is removable from the axle 140 in a tool less manner to removably mount the disc brush on the axle 140.

[0047] In the drawings and specification, there have been disclosed exemplary 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 ELEMENTS

[0048]

100	Ambient Surface Cleaning Device
110	Handle
112	First Part
114	Second Part
116	Sleeve
118	Gripping Zone
120	Gripping Zone
122	Power Switch
130	Driving Mechanism
132	Electric Motor
134	Gear Arrangement
136	Driving Mechanism Housing
138	Protective Hoods
140	Axle
142	First End
144	Second End
150	Brushing Device
160	Support Wheel
X-X'	Central Axis
Y-Y'	Axis
Z-Z'	Axis
A	Arrow
M1	Segment
M2	Segment

Claims

1. An ambient surface cleaning device (100), comprising:

a handle (110);
a driving mechanism (130) operatively coupled to the handle (110), wherein the driving mechanism (130) includes an electric motor (132) and a gear arrangement (134) operatively coupled to each other; and
a brushing device (150) driven by the driving mechanism (130);

characterized in that:

the brushing device (150) is driven in an oscillating

manner.

2. The ambient surface cleaning device **(100)** according to claim **1**, wherein the brushing device **(150)** is a disc brush. 5
3. The ambient surface cleaning device **(100)** according to claim **1**, wherein the brushing device **(150)** is a roller brush. 10
4. The ambient surface cleaning device **(100)** according to any one of the preceding claims, wherein the brushing device **(150)** is divided into multiple segments **(M1, M2)** with at least two segments exhibiting different cleaning characteristics. 15
5. The ambient surface cleaning device **(100)** according to any one of the preceding claims, wherein the brushing device **(150)** includes at least one plastic bristle, and/ or at least one metal bristle, and/ or at least one rake. 20
6. The ambient surface cleaning device **(100)** according to claim **1**, wherein the driving mechanism **(130)** is operatively coupled to the brushing device **(150)** via an axle **(140)**. 25
7. The ambient surface cleaning device **(100)** according to claim **6**, wherein the axle **(140)** has a first end **(142)** and a second end **(144)**, such that the brushing device **(150)** is operatively mounted to at least one of the first end **(142)** and the second end **(144)**. 30
8. The ambient surface cleaning device **(100)** according to claim **7**, wherein a support wheel **(160)** is operatively mounted to one of the first end **(142)** and the second end **(144)** of the axle **(140)**. 35
9. The ambient surface cleaning device according to claim **8**, wherein the brushing device **(150)** and/ or the support wheel **(160)** is operatively mounted to the axle **(140)** in a removable manner. 40
10. The ambient surface cleaning device **(100)** according to claim **9**, wherein the brushing device **(150)** and/ or the support wheel **(160)** is removed without using any tool. 45
11. The ambient surface cleaning device **(100)** according to claim **1**, wherein the driving mechanism **(130)** is housed in a driving mechanism housing **(136)** such that the driving mechanism housing **(136)** is removably coupled to a plurality of protective hoods **(138)**, wherein the plurality of protective hoods **(138)** at least partially shields the brushing device **(150)** and/ or the support wheel **(160)**. 50 55
12. The ambient surface cleaning device **(100)** accord-

ing to claim **1**, wherein the handle **(110)** is telescopic.

13. The ambient surface cleaning device **(100)** according to any of claims **1** or **12**, wherein the handle **(110)** includes at least two gripping zones **(118, 120)**. 5
14. The ambient surface cleaning device **(100)** according to any of claims **1, 12** or **13**, wherein the handle **(110)** includes a power switch **(122)** to operate the ambient surface cleaning device **(100)**. 10
15. The ambient surface cleaning device **(100)** according to any of claims **1, 6, 7, 8** or **9**, wherein an axis of rotation of the axle **(Y-Y')** and an axis of the electric motor **(Z-Z')** are neither parallel nor intersecting. 15

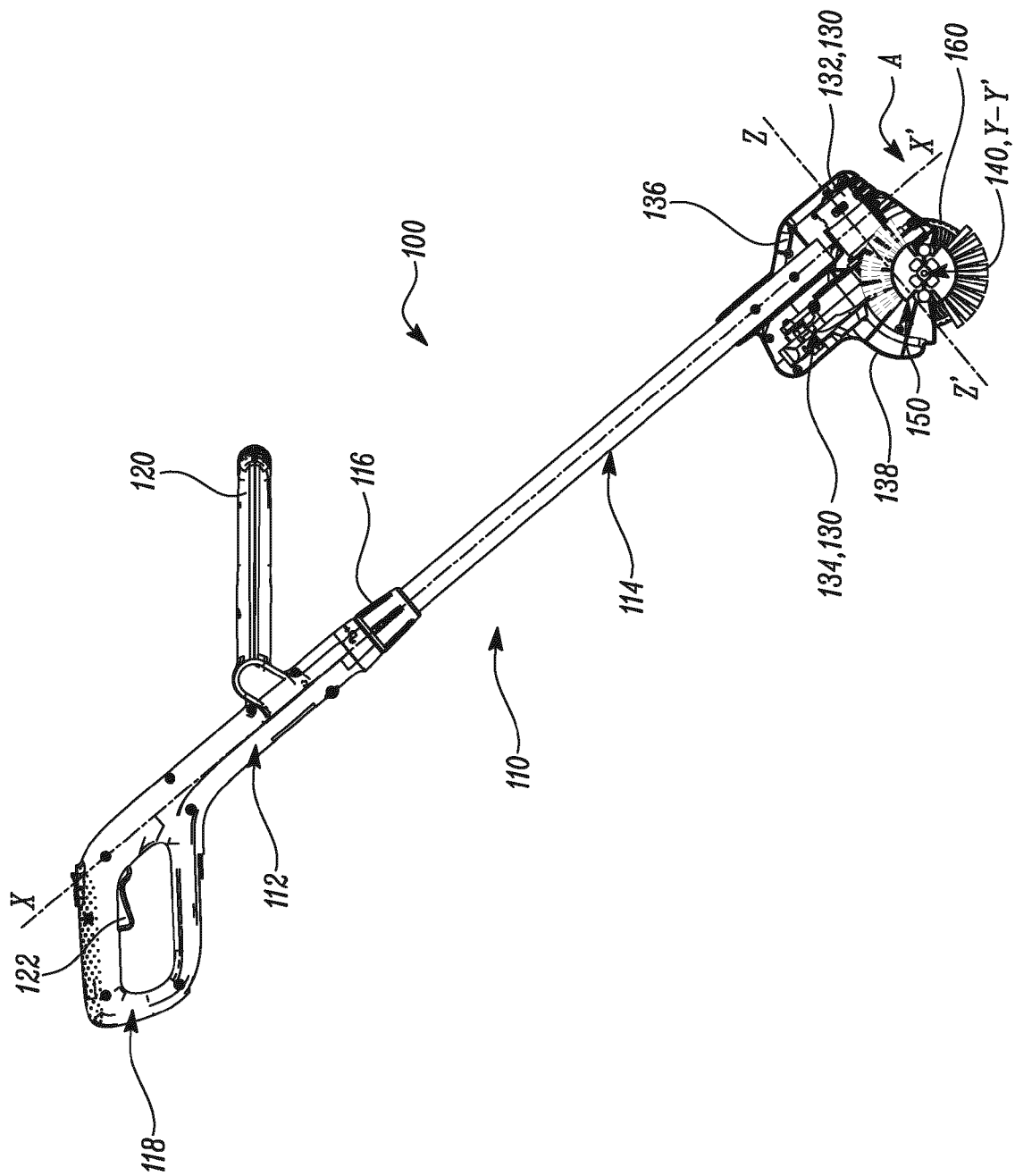
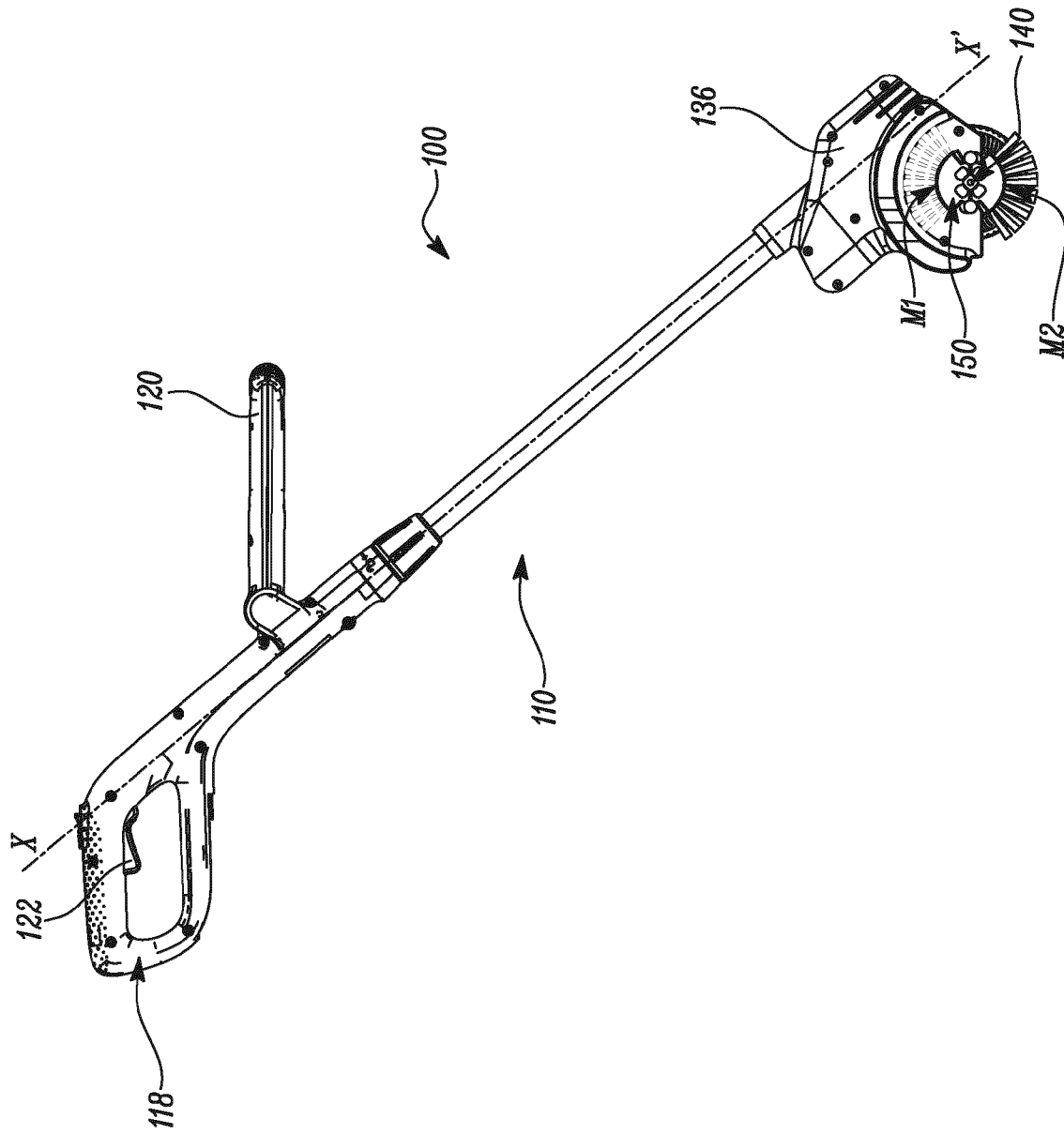


FIG. 1



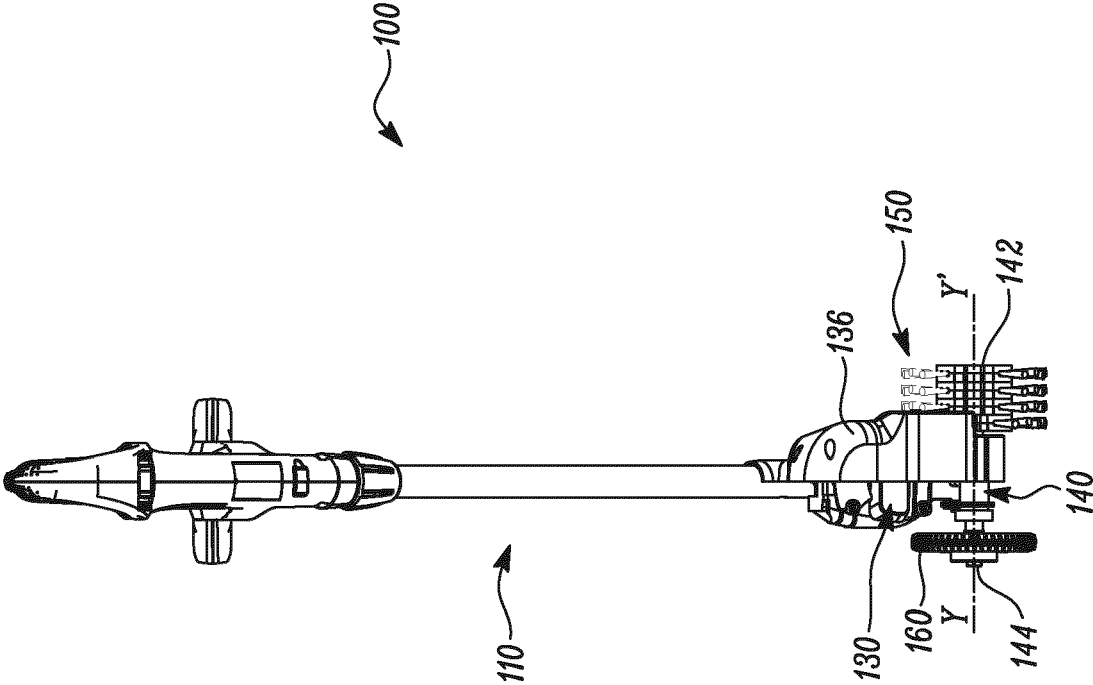


FIG. 3

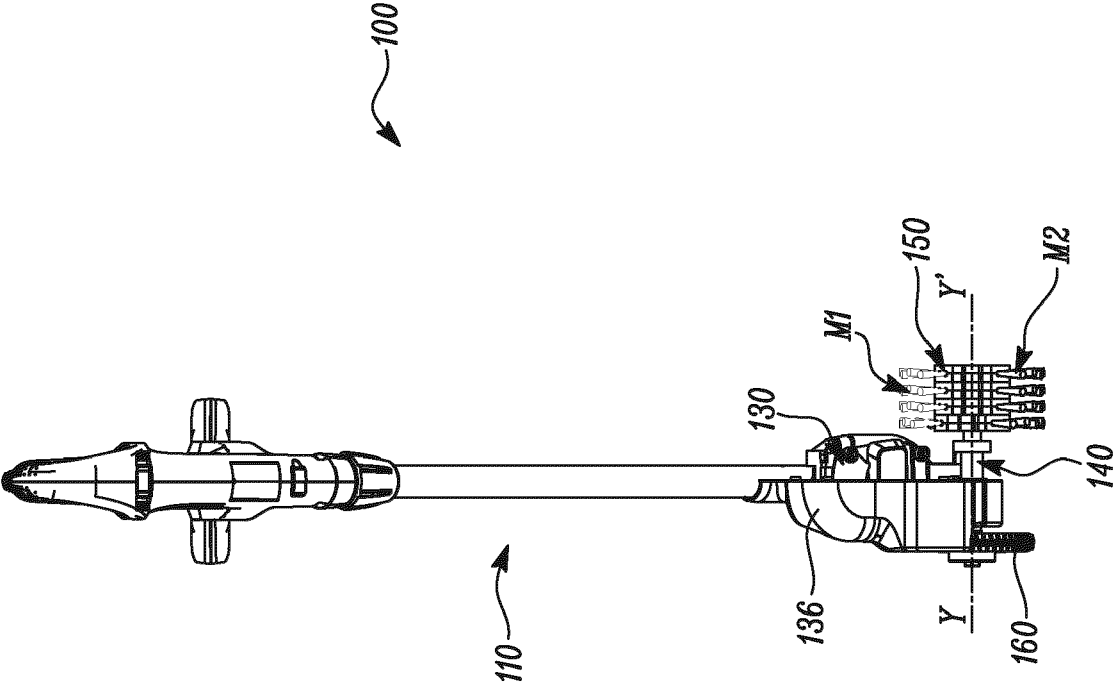


FIG. 4



EUROPEAN SEARCH REPORT

Application Number

EP 23 20 4811

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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A	US 2021/330169 A1 (YANG JUN [CN]) 28 October 2021 (2021-10-28) * paragraph [0036]; figures 6-8 *	1-15	
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 22 April 2024	Examiner Kun, Karla
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