(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 722 531 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
14.10.2020 Bulletin 2020/42

(51) Int Cl.:
E04D 13/076 *(2006.01)*

(21) Application number: **19167915.8**

(22) Date of filing: **08.04.2019**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(71) Applicant: **TTI (Macao Commercial Offshore) Limited**
Macao (MO)

(72) Inventor: **WONG, Wai For**
New Territories
Hong Kong (HK)

(74) Representative: **Grünecker Patent- und Rechtsanwälte**
PartG mbB
Leopoldstraße 4
80802 München (DE)

(54) **GUTTER CLEANER**

(57) There is provided a gutter cleaner having a vacuum mode and a blower mode. The gutter cleaner comprises a housing for accommodating a motor, an air inlet connected to one side of the housing, an air outlet connected to another side of the housing, and a first wheel member arranged adjacent the air outlet. The first wheel member is configured to engage with the gutter edge during the blower mode. Air is drawn in from the air inlet and blown out to the air outlet in both the vacuum mode and the blower mode.

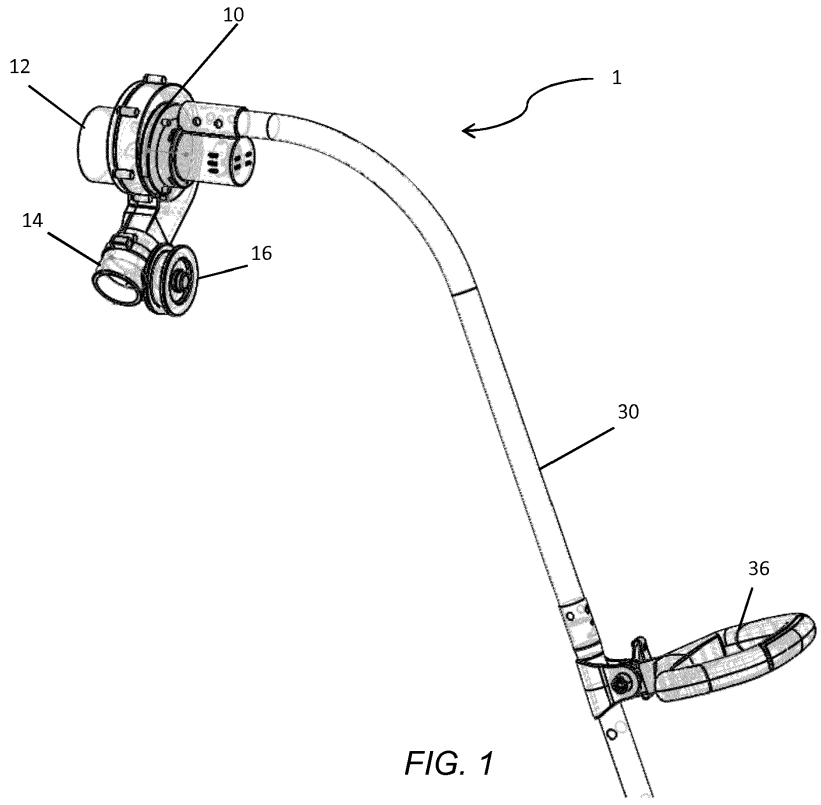

FIG. 1

EP 3 722 531 A1

Description

FIELD OF THE INVENTION

[0001] The present invention relates to a gutter cleaner. More particularly, the present invention relates to a gutter cleaner having a vacuum mode and a blower mode.

BACKGROUND OF THE INVENTION

[0002] There have been proposed and developed several kinds of gutter cleaners to remove leaves or debris from a gutter of a roof. For example, blowers or pressure washers are generally used. Augers are another option to rotate out the debris away from the gutter.

[0003] However, those conventional apparatuses usually make surrounding places dirty as a result of the scattered debris. In addition, it is not convenient for users to climb up to the gutter to do the cleaning job. In some situations, a cleaner head is not accessible to the gutter.

[0004] Therefore, improved gutter cleaners are needed to remove the debris from the gutter efficiently.

SUMMARY OF THE INVENTION

[0005] In accordance with an embodiment of the present invention, there is provided a gutter cleaner having a vacuum mode and a blower mode, comprising a housing for accommodating a motor; an air inlet connected to one side of the housing; an air outlet connected to another side of the housing; and a first wheel member arranged adjacent the air outlet. The first wheel member is configured to engage with the gutter edge during the blower mode. Air is drawn in from the air inlet and blown out to the air outlet in both the vacuum mode and the blower mode.

[0006] In an embodiment of the present invention, the gutter cleaner may further comprise a vacuum nozzle detachably connected to the air inlet to collect debris on the gutter during the vacuum mode.

[0007] In an embodiment of the present invention, the gutter cleaner may further comprise a second wheel member connected to the vacuum nozzle and arranged adjacent to the housing. The second wheel member may be configured to engage with a gutter edge during the vacuum mode.

[0008] In an embodiment of the present invention, a radius of the first wheel member may be smaller than a radius of the second wheel member.

[0009] In an embodiment of the present invention, the gutter cleaner may further comprise a tube connected to the air outlet to lead the collected debris out from the gutter.

[0010] In an embodiment of the present invention, the gutter cleaner may further comprise a storage tank connected to the tube to store the collected debris.

[0011] In an embodiment of the present invention, during the blower mode of the gutter cleaner, the air outlet may be configured to blow out air to clean the gutter.

[0012] In an embodiment of the present invention, the gutter cleaner may further comprise a mirror attached on the housing to allow the user to check the condition of the gutter.

[0013] In an embodiment of the present invention, the gutter cleaner may further comprise a camera attached on the housing to capture or record the condition of the gutter.

[0014] In an embodiment of the present invention, the gutter cleaner may further comprise a pole connected to the housing and handled by a user. The pole may allow the user to operate the gutter cleaner on the ground.

[0015] In an embodiment of the present invention, the gutter cleaner may further comprise a user handle arranged on the pole.

[0016] Other features and aspects of the invention will become apparent by consideration of the following detailed description, drawings and claims. Any feature or features described herein in relation to one aspect or embodiment of the invention, may be combined with any feature or features described herein in relation to any other aspect or embodiment of the invention, as appropriate and applicable.

[0017] Before any independent constructions of the invention are explained in detail, it is to be understood that the invention is not limited in its application to the details of construction and the arrangement of components set forth in the following description or illustrated in the following drawings. The invention is capable of other independent constructions and of being practiced or of being carried out in various ways. Also, it is to be understood that the phraseology and terminology used herein is for the purpose of description and should not be regarded as limiting.

[0018] Use of "including" and "comprising" and variations thereof as used herein is meant to encompass the items listed thereafter and equivalents thereof as well as additional items. Use of "consisting of" and variations thereof as used herein is meant to encompass only the items listed thereafter and equivalents thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] These and other features of the invention will become more apparent from the following description, by way of example only, with reference to the accompanying drawings.

FIG. 1 shows a perspective view of a gutter cleaner according to an embodiment of the present invention.

FIG. 2 shows a perspective view of a gutter cleaner engaged with a gutter according to an embodiment of the present invention.

FIG. 3 shows a perspective view of a gutter cleaner engaged with a gutter according to an embodiment of the present invention.

FIG. 4 shows a perspective view of a gutter cleaner according to an embodiment of the present invention.

[0020] Before any embodiments of the invention are explained in detail, it is to be understood that the invention is not limited in its application to the details of embodiment and the arrangement of components set forth in the following description or illustrated in the following drawings. The invention is capable of other embodiments and of being practiced or of being carried out in various ways. Also, it is to be understood that the phraseology and terminology used herein is for the purpose of description and should not be regarded as limiting.

DETAILED DESCRIPTION

[0021] Fig. 1 shows a perspective view of a gutter cleaner (1) according to an embodiment of the present invention. The gutter cleaner (1) includes a housing (10) for accommodating a motor (not shown), an air inlet (12) connected to one side of the housing (10) and an air outlet (14) connected to any other side of the housing. The air inlet (12) and the air outlet (14) form an air passage through the housing (10). The air is drawn in from the air inlet (12) and blown out from the air outlet (14). In one example, the air inlet (12) can be arranged on forward side of the housing (10) from a user and the air outlet (14) can be arranged on downside of the housing (10) as illustrated in Fig. 1.

[0022] The gutter cleaner (1) includes a first wheel member (16) arranged adjacent the air outlet (14). The first wheel member (16) is configured to engage with a gutter edge during a blower mode. For example, the first wheel member (16) may include a circumferential groove so that the gutter edge is guided in the groove. The gutter cleaner (1) can pivot on the gutter edge by the first wheel member (16).

[0023] The gutter cleaner (1) includes a pole (30) connected to the housing (10). The pole (30) is connected to the housing (10) at one end and is handled by a user at another end. For example, a user grip (36) can be provided on the other end of the pole (30). The pole (30) allows a user to use the gutter cleaner (1) on the ground without climbing a ladder to reach the gutter. The pole (30) can be curved such that a user can easily control the gutter cleaner (1) from the ground. The motor housed in the housing (1) can provide a power to draw in air from the air inlet (12) and to blow out the air through the air outlet (14).

[0024] Fig. 2 shows a perspective view of a gutter cleaner (1) engaged with a gutter (2) during a vacuum mode according to an embodiment of the present invention. In one embodiment, the gutter cleaner (1) can further include a vacuum nozzle (32) connected to the air inlet (12) to collect debris on the gutter (2) during the vacuum mode. The vacuum nozzle (32) can be connected to the air inlet (12) directly or via a connecting pipe to provide connection flexibility in terms of direction of the nozzle opening or the distance between the nozzle (32) and the housing (10).

[0025] The vacuum nozzle (32) can be selectively connected to the air inlet (12) when necessary, for example, for the vacuum mode. The vacuum nozzle (32) can be disconnected from the air inlet (12) when the gutter cleaner (1) is in a blower mode as will be described later.

[0026] In one embodiment, the gutter cleaner (1) further includes a second wheel member (18) connected to the vacuum nozzle (32) and arranged adjacent to the housing (10). The second wheel member (18) can be connected to the vacuum nozzle (32) through the connecting pipe. The vacuum nozzle (32) and the second wheel member (18) can be detached from the air inlet (12) as a whole. Alternatively, each of the vacuum nozzle (32) and the second wheel member (18) can be detached independently from the air inlet (12). The second wheel member (18) is configured to engage with a gutter edge (20) of the gutter (2) during the vacuum mode. For example, the second wheel member (18) may include a circumferential groove so that the gutter edge (20) is guided in the groove. The gutter cleaner (1) can pivot on the gutter edge (20) by the second wheel member (18) during the vacuum mode. In one embodiment, a radius of the first wheel member (16) is smaller than a radius of the second wheel member (18).

[0027] In one embodiment, the gutter cleaner (1) can further include a tube (34) to lead the collected debris out from the gutter (2) during the vacuum mode. The tube (34) is connected to the air outlet (14) such that the collected debris from the vacuum nozzle (32) is lead through the tube (34) via the air outlet (14). The tube (34) can be disconnected from the air outlet (14) when necessary, for example, during a blower mode. The guided debris through the tube (34) can be located in certain places or locations upon user's need. In one embodiment, a storage tank (not shown) can be provided at one end of the tube (34), that is, the opposite end to the end where the air outlet (14) is connected. For example, the storage tank can be connected to the tube (34) to store the collected debris. The storage tank can be detached for emptying or cleaning purpose.

[0028] When the gutter cleaner (1) is operated in the vacuum mode, the gutter cleaner (1) moves along the gutter (2) by the second wheel member (18), and debris in the gutter (2) is vacuumed up through the vacuum nozzle (32) and blown into the tube (34) and collected in the storage tank or in the preferred places.

[0029] According to the present invention, the collected debris is not scattered around or beneath the gutter (2) because the debris in the gutter (2) is vacuumed up and guided to certain places or the storage tank.

[0030] FIG. 3 shows a perspective view of a gutter

cleaner (1) engaged with a gutter (2) during a blower mode according to an embodiment of the present invention. The gutter cleaner (1) can be operated in the blower mode, when the gutter (2) is not accessible by the vacuum nozzle (32), or when the gutter (2) is under a roof (50) or covered partially by the roof (50).

[0031] In this case, the vacuum nozzle (32) and the tube (34) are not provided in the gutter cleaner (1). Also, the second wheel member (18) may be disconnected from the gutter cleaner (1). In the blower mode, the pivot from the second wheel member (18) is changed to the first wheel member (16). When the gutter cleaner (1) is operated in the blower mode, the motor provides power for drawing in air from the air inlet (12) and blow out the air through the air outlet (14) such that the air can blow away debris from the gutter (2). In other words, the air passage from the air inlet (12) to the air outlet (14) remains the same during the vacuum mode and the blower mode, however, by removing the vacuum nozzle (32) and the tube (34) (and the second wheel member (18) optionally), and changing the pivot from the second wheel member (18) to the first wheel member (16), the tube connection part, i.e., the air outlet (14) becomes a blower outlet, and the gutter cleaner (1) operates as a blower to force all the stuff to leave the gutter (2).

[0032] When the vacuum nozzle (32) is not accessible to the gutter (2) and/or the gutter (2) is partially covered by the roof (50) or the like as shown in Fig. 3, the gutter cleaner (1) can be switched to the blower mode and remove the debris by blowing out air while being supported by the first wheel member (16) engaged with the gutter edge (20). Users can simply switch between the vacuum mode and the blower mode depending on the situation by just removing or adding some parts and switching the pivoting wheel.

[0033] FIG. 4 shows a perspective view of a gutter cleaner (1) according to an embodiment of the present invention. The gutter cleaner (1) can further include a mirror (40) attached on the housing (10) to allow the user to check and monitor the condition inside the gutter (2) from the ground. The mirror (40) can allow the user to see the internal gutter (2) by reflection of the condition of the gutter (2). By using the mirror (40), the user can check the condition of the gutter (2) and control the pole (30) to direct the vacuum nozzle (32) in a desired direction for better performance in the vacuum mode. In the blower mode, the user can control the pole (30) to direct the air outlet (14) in a desired direction based on the reflected image of the condition of the gutter (2). In another embodiment, a camera (not shown) can be provided to be attached on the housing (10) to capture or record the condition of the gutter (2). For example, the camera can be attached on the same location as the mirror in Fig. 4. The camera can capture or record the instant situation of the gutter (2) and send the information thereof to user's mobile phone wirelessly so that the user can view the captured image or the moving image through a phone application or the like.

[0034] According to the present invention, the gutter cleaner (1) is configured to function either a vacuum or a blower depending on the condition of the gutter (2) by simply adding or removing some parts and changing the pivot between the first wheel member (18) and the second wheel member (16). Further, users can easily control the gutter cleaner from the ground while monitoring the condition of the gutter.

[0035] It should be understood that the above only illustrates and describes examples whereby the present invention may be carried out, and that modifications and/or alterations may be made thereto without departing from the spirit of the invention.

[0036] It should also be understood that certain features of the invention, which are, for clarity, described in the context of separate embodiments, may also be provided in combination in a single embodiment. Conversely, various features of the invention which are, for brevity, described in the context of a single embodiment, may also be provided or separately or in any suitable subcombination.

Claims

1. A gutter cleaner having a vacuum mode and a blower mode, comprising:

   a housing for accommodating a motor;
   an air inlet connected to one side of the housing;
   an air outlet connected to another side of the housing; and
   a first wheel member arranged adjacent the air outlet, the first wheel member being configured to engage with the gutter edge during the blower mode,
   wherein air is drawn in from the air inlet and blown out to the air outlet in both the vacuum mode and the blower mode.

2. The gutter cleaner of claim 1, further comprising a vacuum nozzle detachably connected to the air inlet to collect debris on the gutter during the vacuum mode.

3. The gutter cleaner of claim 2, further comprising a second wheel member connected to the vacuum nozzle and arranged adjacent to the housing, the second wheel member being configured to engage with a gutter edge during the vacuum mode.

4. The gutter cleaner of claim 3, wherein a radius of the first wheel member is smaller than a radius of the second wheel member.

5. The gutter cleaner of any preceding claim, further comprising a tube connected to the air outlet to lead the collected debris out from the gutter.

6. The gutter cleaner of claim 5, further comprising a storage tank connected to the tube to store the collected debris.

7. The gutter cleaner of any preceding claim, wherein during the blower mode, the air outlet is configured to blow out air to clean the gutter.

8. The gutter cleaner of any preceding claim, further comprising a mirror attached on the housing to allow the user to check the condition of the gutter.

9. The gutter cleaner of any preceding claim, further comprising a camera attached on the housing to capture or record the condition of the gutter.

10. The gutter cleaner of any preceding claim, further comprising a pole connected to the housing and handled by a user, the pole allowing the user to operate the gutter cleaner on the ground.

11. The gutter cleaner of claim 10, further comprising a user handle arranged on the pole.

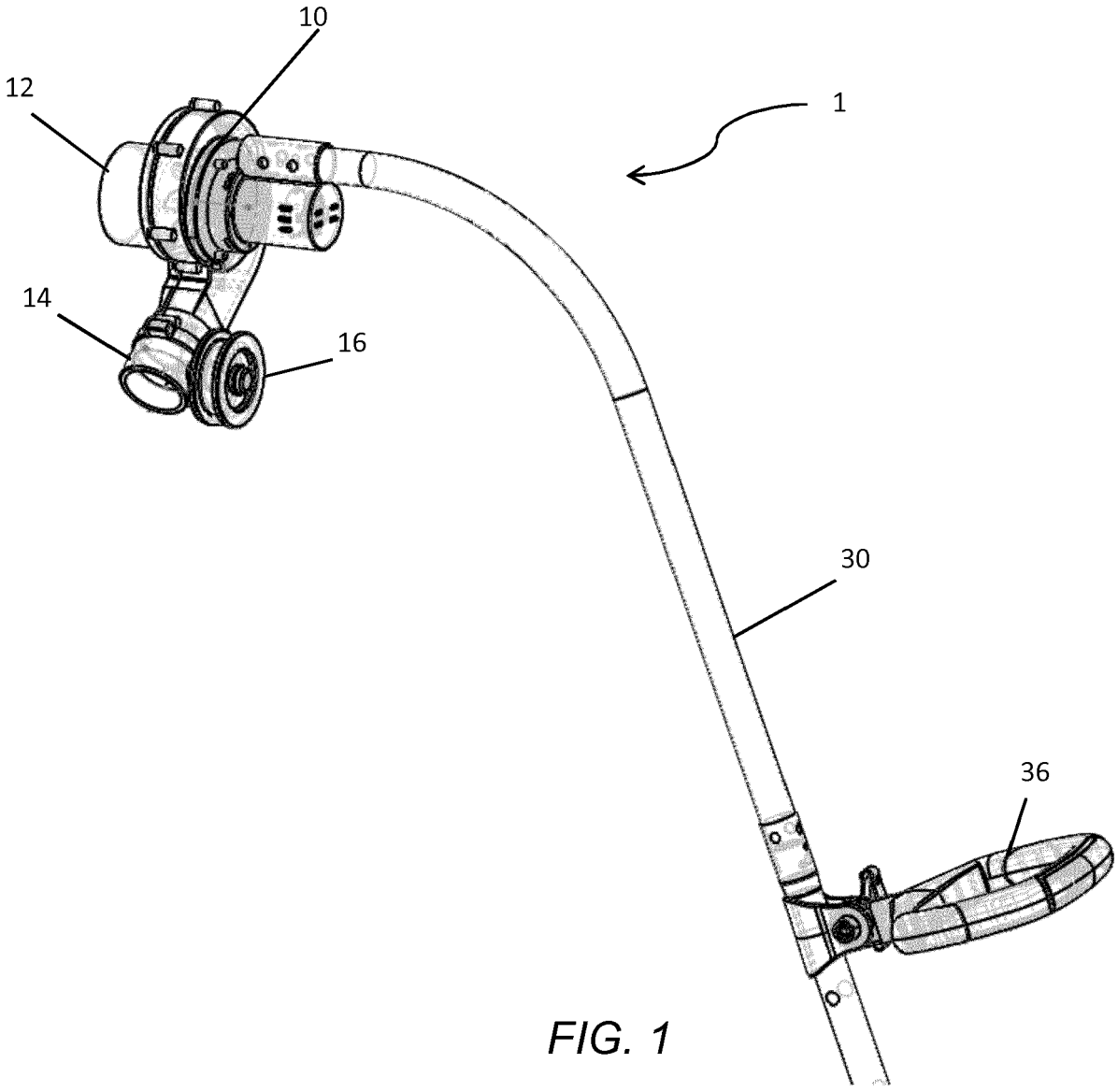

FIG. 1

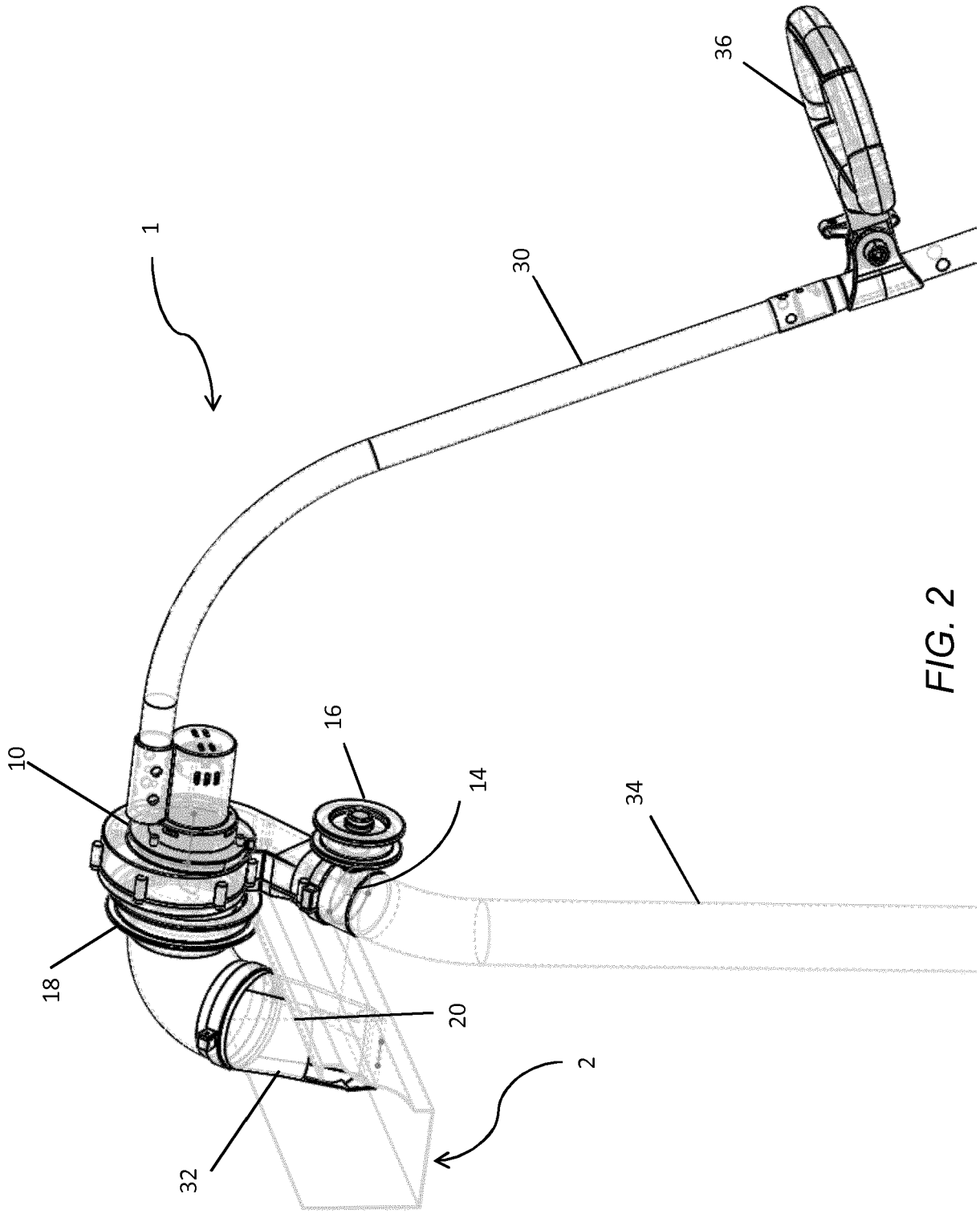

FIG. 2

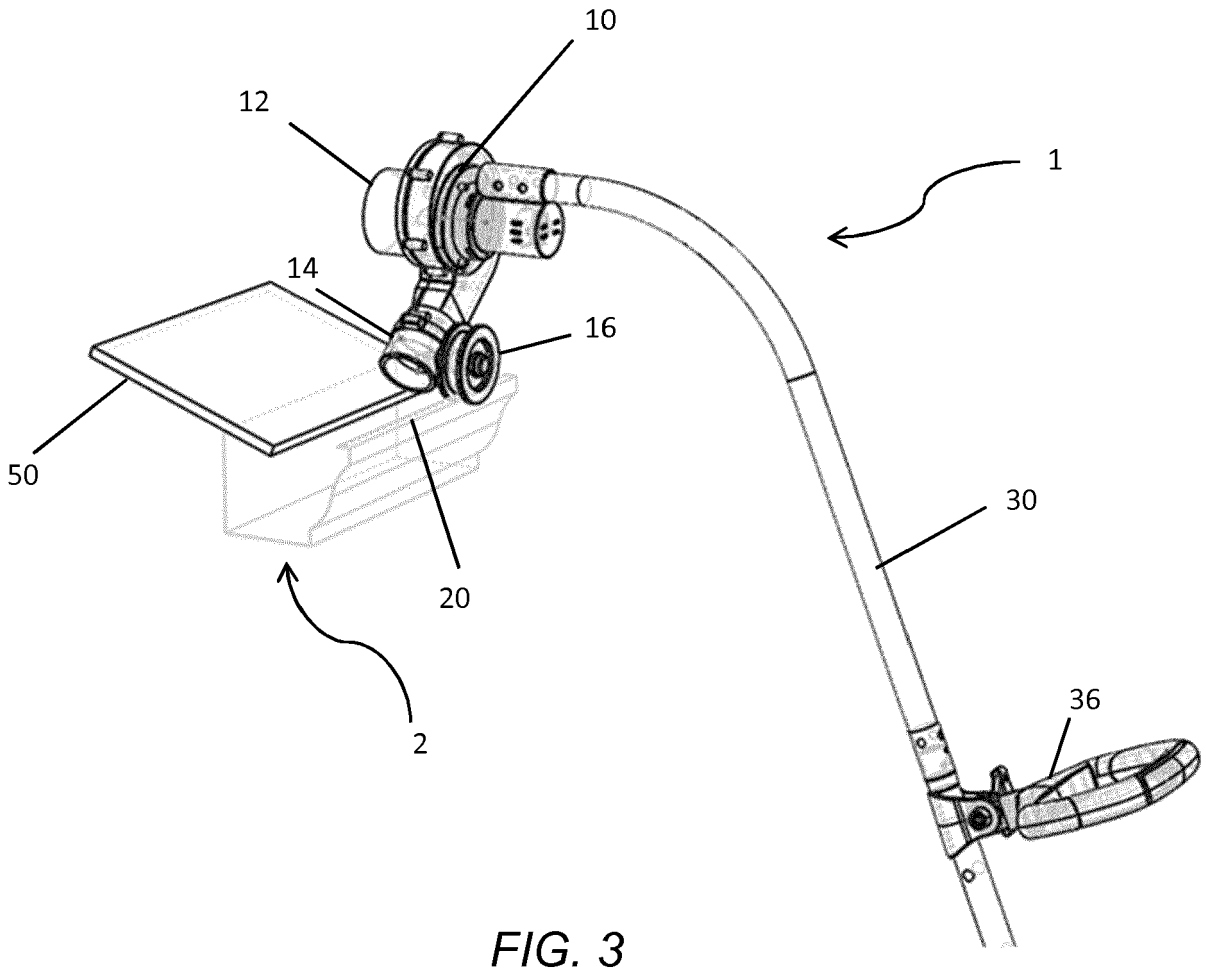

FIG. 3

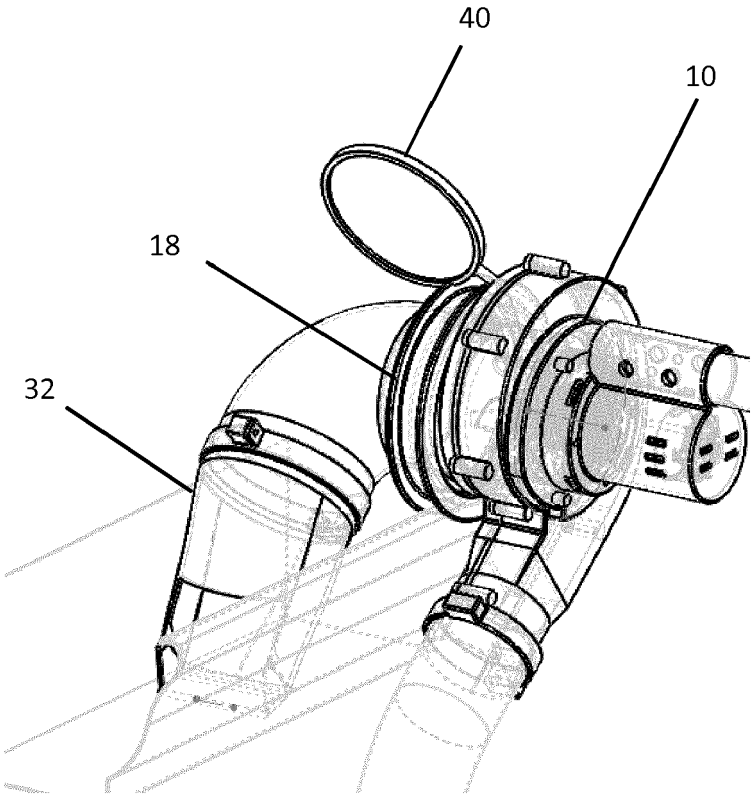

FIG. 4

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 19 16 7915

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y A	US 9 267 291 B1 (RAMSEY MARK J [US] ET AL) 23 February 2016 (2016-02-23) * figures 1-2 *	1,2,5-11 3,4	INV. E04D13/076
Y	US 2015/000070 A1 (LIU JIABO [CN] ET AL) 1 January 2015 (2015-01-01) * paragraph [0071] *	1,2,5-11	
Y	US 5 535 479 A (PINK ANTHONY N [US] ET AL) 16 July 1996 (1996-07-16) * figures 2-4 *	1,2,5-11	
Y	DE 93 10 420 U1 (SCHOENROCK ARMIN [DE]) 5 January 1994 (1994-01-05) * figures 1-3 *	1,2,5-11	
Y	US 5 195 209 A (WATKINS RICHARD L [US]) 23 March 1993 (1993-03-23) * figures 1,4,6 *	5,6,8-10	
Y	WO 01/54554 A1 (HALL IRA GEORGE [US]) 2 August 2001 (2001-08-02) * figure 1 *	5,6,9,10	TECHNICAL FIELDS SEARCHED (IPC) E04D A47L
Y	US 2011/132405 A1 (LOWENSTEIN ARNOLD [US]) 9 June 2011 (2011-06-09) * figures 1,11 *	5,6,10, 11	A01G B08B E01H
Y A	FR 2 726 840 A1 (CHAMOREAU CAMILLE [FR]) 15 May 1996 (1996-05-15) * figures 1-3 *	5,6,10, 11 3,4	
A	US 2004/020516 A1 (BUCKNER DON MARTIN [US]) 5 February 2004 (2004-02-05) * figure 5 *	1-11	
A	EP 1 232 717 A2 (RYOBI LTD [JP]) 21 August 2002 (2002-08-21) * abstract; figure 4 *	1-11	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	6 September 2019	Leroux, Corentine

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 19 16 7915

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

06-09-2019

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 9267291 B1	23-02-2016	US 9267291 B1	23-02-2016
		WO 2016069060 A1	06-05-2016
US 2015000070 A1	01-01-2015	CN 104250958 A	31-12-2014
		US 2015000070 A1	01-01-2015
		WO 2014205923 A1	31-12-2014
US 5535479 A	16-07-1996	NONE	
DE 9310420 U1	05-01-1994	NONE	
US 5195209 A	23-03-1993	NONE	
WO 0154554 A1	02-08-2001	CA 2398230 A1	02-08-2001
		US 6185782 B1	13-02-2001
		WO 0154554 A1	02-08-2001
US 2011132405 A1	09-06-2011	NONE	
FR 2726840 A1	15-05-1996	NONE	
US 2004020516 A1	05-02-2004	NONE	
EP 1232717 A2	21-08-2002	AU 784079 B2	02-02-2006
		DE 60204177 T2	26-01-2006
		EP 1232717 A2	21-08-2002
		JP 3643041 B2	27-04-2005
		JP 2002238809 A	27-08-2002
		US 2002108207 A1	15-08-2002

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82