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(72) Inventors:
• **Buczko, Dariusz**
35-205 Rzeszów (PL)
• **Ferus, Wojciech**
35-328 Rzeszów (PL)

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Amended claims in accordance with Rule 137(2) EPC.

(71) Applicant: **BSH Hausgeräte GmbH**
81739 München (DE)

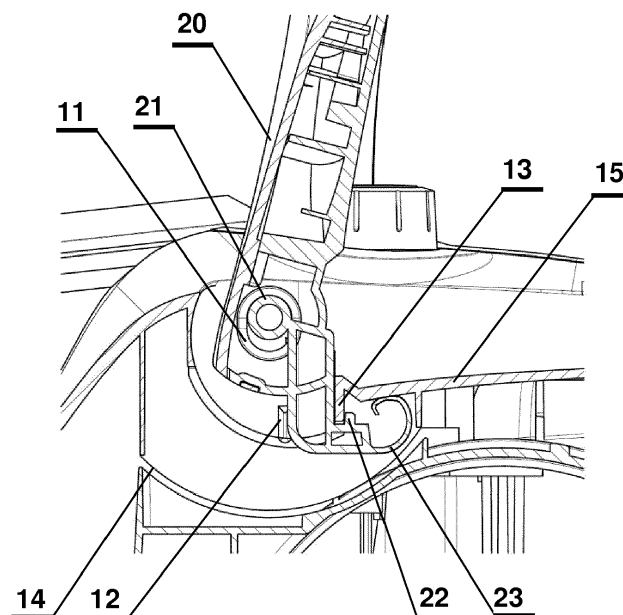
(54) HANDLE FOR A VACUUM CLEANER

(57) A handle (20) for a vacuum cleaner which is pivotally mounted on a vacuum cleaner body (10) and which can be moved between a first position in which the handle (20) is located substantially horizontal with respect to the vacuum cleaner body (10) and a second position in which the handle (20) is substantially vertical with respect to the vacuum cleaner body (10), wherein the handle (20) in said second position has at least two positions, namely a lower position in which the handle (20) can be rotated

freely and an upper position in which a hook (22) of a spring (23) engages a protrusion (13) of the vacuum cleaner body (10).

The present invention provides a simple and efficient solution for blocking the handle of the vacuum cleaner in a position in which the vacuum cleaner can be carried by the user in a safe and comfortable manner. The invention also relates to an automatic release system for the handle of a vacuum cleaner.

Fig. 3



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Description

Background of the invention

[0001] The present invention relates to a handle for a vacuum cleaner which is pivotally mounted on a vacuum cleaner body and which can be moved between a first position in which the handle is located substantially horizontal with respect to the vacuum cleaner body and a second position in which the handle is substantially vertical with respect to the vacuum cleaner body.

State of the art

[0002] The patent application CN 101 879 714 A1 discloses a handle folding mechanism. The mechanism comprises a body, a handle and a locking mechanism, wherein an end part of the handle, which is connected with a rotating shaft, is a pivoted part; the pivoted part is provided with a clamping groove; the locking mechanism comprises a locking piece which is elastically arranged on the body; the pivoted part is provided with a friction groove and a positioning groove; the friction groove extends along the outer circumferential surface of the pivoted part; the positioning groove is formed in the clamping groove; a position on the locking piece, which is opposite to the friction groove, is provided with a convex rib projecting out of the surface of the locking piece; when the locking mechanism is in a locking state, the locking piece is clamped in the clamping groove, the convex rib is clamped in the positioning groove and the body is relatively fixed with the handle; and when the locking mechanism is in an unlocking state, the locking piece is separated from the clamping groove, the convex rib is arranged in the friction groove in a sliding way, when the handle rotates, the convex rib is only contacted with the friction groove and the locking piece is not contacted with the outer circumferential surface of the pivoted part. Therefore, scratches are only produced at the bottom of the friction groove, the outer surface of the pivoted part is kept bright and clean for a long time and household appliance products are kept attractive for a long time.

[0003] The patent application WO 2010 092 061 A1 discloses an invention which relates to a suction cleaning device comprising a suction apparatus, a base that can be moved and on which the suction apparatus is arranged, and a handle that can be swiveled back and forth between a swiveled-in position and a swiveled-out position and that can be fixed in the swiveled-out position by means of a locking device. In order to develop the suction cleaning device in such a way that the suction cleaning device can be handled in an easier manner, it is proposed that the locking device comprise at least one release element that can be actuated by the user for releasing the handle in the swiveled-out position thereof.

[0004] The patent application WO 2010 061 299 A1 shows a robotic vacuum cleaner comprising sensor means for detecting physical contact with stationary ob-

jects in the environment of the vacuum cleaner. The vacuum cleaner comprises a handle for carrying the vacuum cleaner by hand. The handle can be in a second position whereby the handle is located close to the body of the vacuum cleaner, whereby the sensor means detect forces exerted on the handle during operation of the vacuum cleaner.

[0005] Presented solutions do not provide an efficient, simple and automatic system for blocking a handle of a vacuum cleaner in position in which the vacuum cleaner can be carried in a safe and convenient way.

The aim of the invention

[0006] It is the object of the present invention to overcome problems associated with vacuum cleaner handles and provides a simple and efficient automatic blocking and releasing system for a vacuum cleaner handle.

Summary of the invention

[0007] These objects are solved by a handle for a vacuum cleaner whereby a handle in a second position has at least two positions, namely a lower position in which the handle can be rotated freely and an upper position in which a hook of a spring engages a protrusion of the vacuum cleaner body.

[0008] The handle is an element of the vacuum cleaner which is pivotally mounted on the vacuum cleaner body and which is provided for the carrying purposes. The handle has two main positions: a first and a second position. In the first position the handle is folded into a stored position in which the handle is substantially horizontal and close to the vacuum cleaner body. During the vacuuming process or during storage of the vacuum cleaner the handle stays in the first position. The positive effect is that the handle does not protrude over the vacuum cleaner body so the manipulation the vacuum cleaner hose is easy.

[0009] In the second position the handle is substantially vertical. The second position is an unfolded position. The second position of the handle has two variants: a lower position in which the handle can be rotated freely and an upper position in which a hook of a spring engages a protrusion of the vacuum cleaner body. In the lower position the handle can be rotated freely what means that the handle can be folded into first position without using much force by the user. In the upper position the hook of a spring which both are parts of the handle engages a protrusion of the vacuum cleaner body. The hook is a small protrusion designed as a part on the spring. The shape of the hook matches the shape of the protrusion of the vacuum cleaner body. The positive effect is that the engagement of the hook with the protrusion is firm and reliable.

[0010] When the hook engages a protrusion the handle rotation is blocked. The advantage of blocking the handle in the second position is that swinging the vacuum clean-

er back and forth is prevented. Thanks to this blocking system the handling of the vacuum cleaner is comfortable for consumer.

Preferred embodiment of the invention

[0011] In a preferred embodiment of the invention the spring is pressed by a wall of the vacuum cleaner body in the upper position of the handle. When the vacuum cleaner is lifted by the user the handle moves to the upper position and causes the spring compression which is caused by the wall of the vacuum cleaner.

[0012] In a preferred embodiment of the invention the handle moves from the upper position to the lower position automatically by the force of the spring. In the upper position the handle is blocked against rotation. The only possible move for the handle is return to the lower position. After releasing the handle from user's hand the handle backs automatically to the lower position by the force of the spring and to the gravity. The advantage is that the handle returns to the lower position without using any force or any activity of the user. The handle moves to the lower position automatically thanks only to the spring expansion force and the force of the gravity.

[0013] In a preferred embodiment of the invention the spring cooperates with a guiding surface as the handle moves between the first position and the second position. The guiding surface is an arc shaped surface on which the spring is sliding. The positive effect is that the movement of the handle is smooth and manipulation of the handle is convenient for the user.

[0014] In another embodiment of the invention the handle and the spring are one element. The spring and the handle are designed as one part. The advantage is that the production process is simple and the mounting operation is eliminated. The spring and the handle can be produced as two separate parts and mounted during mounting process.

[0015] Advantageously the handle is a two part element. The handle consist of two part which are mounted together during assembling process. The positive effect is that the stiffness of the handle is great and the production is simpler as the injection moulds are not complicated as in case of one part. The handle can consist of more than two parts.

[0016] In a favourable embodiment of the invention the vacuum cleaner body is provided with a blocking element. The blocking element is a small protrusion placed on the vacuum cleaner body. The blocking element is provided in order to hold the handle in the vertical position and prevent the handle from moving into different positions, especially to the substantially horizontal first position. In order to move the handle into the first position the user need to use some power to force the spring to pass over the blocking element. The advantage is that the accidental movement of the handle is prevented.

[0017] In another embodiment of the invention a pin of the handle cooperates with a socket of the vacuum clean-

er body. The handle has two pins. Each of the pins is placed at the end portions of the handle. The vacuum cleaner body has two sockets which are placed on two opposite sides of the vacuum cleaner body and each pin is inserted into one socket. The handle is mounted on the vacuum cleaner body during mounting process. The advantage is that the mounting is simple and fast.

[0018] In another embodiment of the invention the diameter of the socket is greater than the diameter of the pin. The socket has the oval shape and the height of the socket is greater than the width in order to let the handle in the second position to move from the lower position to the upper position. The diameter of the pin is smaller than the diameter of the socket for the same purpose. The positive effect is that the movement of the handle in the vertical direction is possible.

[0019] It is to be understood that both the foregoing general description and the following detailed description are exemplary, and are intended to provide further explanation of the invention as claimed. Other advantages and features of the invention will be apparent from the following description, drawings and claims.

[0020] The present invention provides a simple and efficient solution for blocking the handle of the vacuum cleaner in a position in which the vacuum cleaner can be carried by the user in a safe and comfortable manner. The invention also relates to an automatic release system for the handle of a vacuum cleaner.

Brief description of the figures

[0021] The features of the invention believed to be novel are set forth with particularity in the appended claims. The invention itself, however, may be best understood by reference to the following detailed description of the invention, which describes an exemplary embodiment of the invention, taken in conjunction with the accompanying drawings. Further benefits and advantages of the present invention will become apparent after a careful reading of the detailed description with appropriate reference to the accompanying drawings.

[0022] In the drawings:

Fig. 1 exemplary shows an isometric view of the vacuum cleaner body with a handle in a first position;

Fig. 2 shows a cross section of the handle in a lower position;

Fig. 3 shows a cross section of the handle in an upper position;

Fig. 4 shows an isometric view of the vacuum cleaner with a handle in a second position;

Detail description of the invention

[0023] In cooperation with attached drawings, the technical contents and detailed description of the present invention are described thereafter according to a preferable embodiment, being not used to limit its executing scope. Any equivalent variation and modification made according to appended claims is all covered by the claims claimed by the present invention.

[0024] In the following description of the preferred embodiments of the present invention, similar identical reference numbers designate identical or comparable components.

[0025] Vacuum cleaners are well known in the state of the art devices which are commonly used all over the world in homes as well as in the industry. Typical canister vacuum cleaner is a device that uses an air pump to create a partial vacuum to suck up dust and dirt, usually from floors and other surfaces such as upholstery, cushions or curtains. The dirt is collected inside a dust bag or dust receptacle for later disposal. For the carrying purpose vacuum cleaners are provided with handles.

[0026] Fig. 1 shows an isometric view of the vacuum cleaner body 10 with a handle 20 in a first position. The handle 20 is in a first position which means that it is substantially horizontal and placed close to the vacuum cleaner body 10. The first position is a storage position when the vacuum cleaner is not working or when the vacuum cleaner is working and the handle 20 is folded so that it does not constitute an obstacle for the consumer during vacuuming.

[0027] Fig. 2 shows a cross section of the handle 20 in a lower position. When the handle is in unfolded second position it can be moved into a lower position or into an upper position. In the lower position the pin 21 of the handle 20 is placed in the lower area of the socket 11. The spring 23 is expanded and touches the wall 15 and the guiding surface 14 of the vacuum cleaner body 10 tangentially. The hook 22 is situated at a distance from the protrusion 13. The blocking element 12 holds the handle 20 in vertical position in which an automatic move of the handle 20 into folded first position is prevented. In order to move the handle 20 into first position the user has to push the handle 20 with a little force towards the vacuum cleaner body 10.

[0028] Fig. 3 shows a cross section of the handle 20 in an upper position. The handle 20 moves in an upper position when the vacuum cleaner is carried by the user. In the upper position of the handle 20 the pin 21 of the handle 20 is placed in the upper area of the socket 11. The spring 23 is compressed by the wall 15 and the hook 22 engages the protrusion 13. The handle 20 in the second upper position is blocked by the blocking element 12 and also by the engagement of the hook 22 with the protrusion 13. After releasing by the user the handle 20 moves down into the lower position automatically by the spring 23 expansion and the gravity.

[0029] Fig. 4 shows an isometric view of the vacuum

cleaner body 10 with a handle 20 in a second position. In such position of the handle 20 the vacuum cleaner can be carried by the user or the handle 20 can be moved into the folded first position (not shown on the figure).

[0030] The present invention provides a simple and efficient solution for blocking the handle of the vacuum cleaner in a position in which the vacuum cleaner can be carried by the user in a safe and comfortable manner. The invention also relates to an automatic release system for the handle of a vacuum cleaner.

LIST OF REFERENCE SIGNS

[0031]

10	vacuum cleaner body
11	socket
12	blocking element
13	protrusion
14	guiding surface
15	wall
20	handle
21	pin
22	hook
23	spring

Claims

1. A handle (20) for a vacuum cleaner which is pivotally mounted on a vacuum cleaner body (10) and which can be moved between a first position in which the handle (20) is located substantially horizontal with respect to the vacuum cleaner body (10) and a second position in which the handle (20) is substantially vertical with respect to the vacuum cleaner body (10) **characterized in that** the handle (20) in said second position has at least two positions, namely a lower position in which the handle (20) can be rotated freely and an upper position in which a hook (22) of a spring (23) engages a protrusion (13) of the vacuum cleaner body (10).
2. The handle (20) according to claim 1, **characterized in that** the spring (23) is pressed by a wall (15) of the vacuum cleaner body (10) in the upper position of the handle (20).
3. The handle (20) according to claim 2, **characterized in that** the handle (20) moves from the upper position to the lower position automatically by the force of the spring (23).
4. The handle (20) according to any of preceding claims, **characterized in that** the spring (23) cooperates with a guiding surface (14) during movement of the handle (20) between the first position and the

second position.

5. The handle (20) according to any of preceding claims, **characterized in that** the handle (20) and the spring (23) are one element. 5
6. The handle (20) according to any of preceding claims, **characterized in that** the handle (20) is a two part element. 10
7. The handle (20) according to any of preceding claims, **characterized in that** the vacuum cleaner body (10) is provided with a blocking element (12). 15
8. The handle (20) according to any of preceding claims, **characterized in that** a pin (21) of the handle (20) cooperates with a socket (11) of the vacuum cleaner body (10). 20
9. The handle (20) according to any of preceding claims, **characterized in that** the diameter of the socket (11) is greater than the diameter of the pin (21). 25

Amended claims in accordance with Rule 137(2) EPC.

1. A vacuum cleaner comprising a vacuum cleaner body (10) and a handle (20) for carrying the vacuum cleaner which handle (20) is pivotally mounted on the vacuum cleaner body (10) and which handle (20) can be moved between a first position in which the handle (20) is located substantially horizontal with respect to the vacuum cleaner body (10) and a second position in which the handle (20) is substantially vertical with respect to the vacuum cleaner body (10) **characterized in that** the handle (20) in said second position has at least two positions, namely a lower position in which the handle (20) can be rotated freely and an upper position in which a hook (22) of a spring (23) engages a protrusion (13) of the vacuum cleaner body (10) to block the rotation of the handle (20). 30 35 40
2. The vacuum cleaner according to claim 1, **characterized in that** the spring (23) is pressed by a wall (15) of the vacuum cleaner body (10) in the upper position of the handle (20). 45
3. The vacuum cleaner according to claim 2, **characterized in that** the handle (20) moves from the upper position to the lower position automatically by the force of the spring (23). 50
4. The vacuum cleaner according to any of preceding claims, **characterized in that** the spring (23) cooperates with a guiding surface (14) during movement of the handle (20) between the first position and the 55

second position.

5. The vacuum cleaner according to any of preceding claims, **characterized in that** the handle (20) and the spring (23) are one element.
6. The vacuum cleaner according to any of preceding claims, **characterized in that** the handle (20) is a two part element.
7. The vacuum cleaner according to any of preceding claims, **characterized in that** the vacuum cleaner body (10) is provided with a blocking element (12) which serves to hold the handle (20) in the second position.
8. The vacuum cleaner according to any of preceding claims, **characterized in that** a pin (21) of the handle (20) cooperates with a socket (11) of the vacuum cleaner body (10).
9. The vacuum cleaner according to any of preceding claims, **characterized in that** the diameter of the socket (11) is greater than the diameter of the pin (21).

Fig. 1

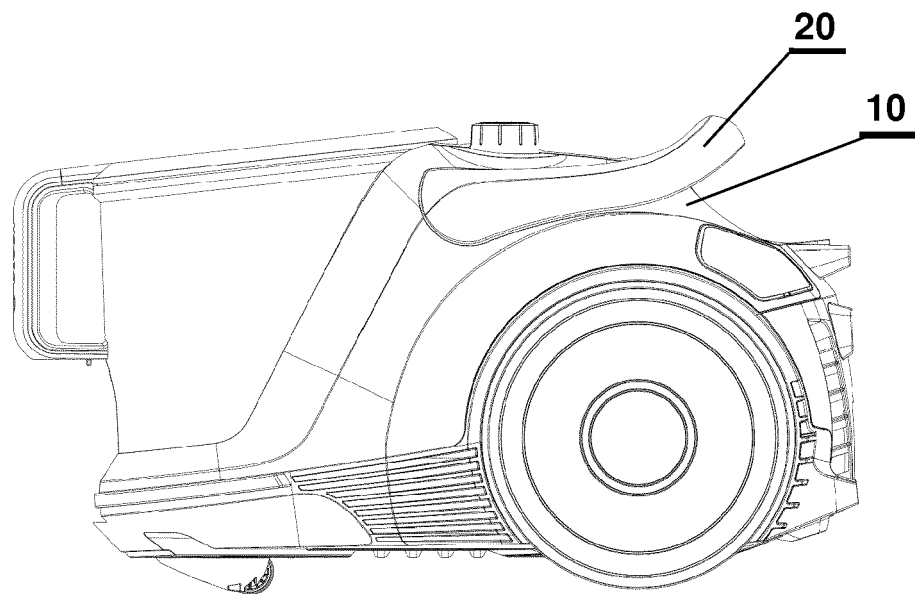


Fig. 2

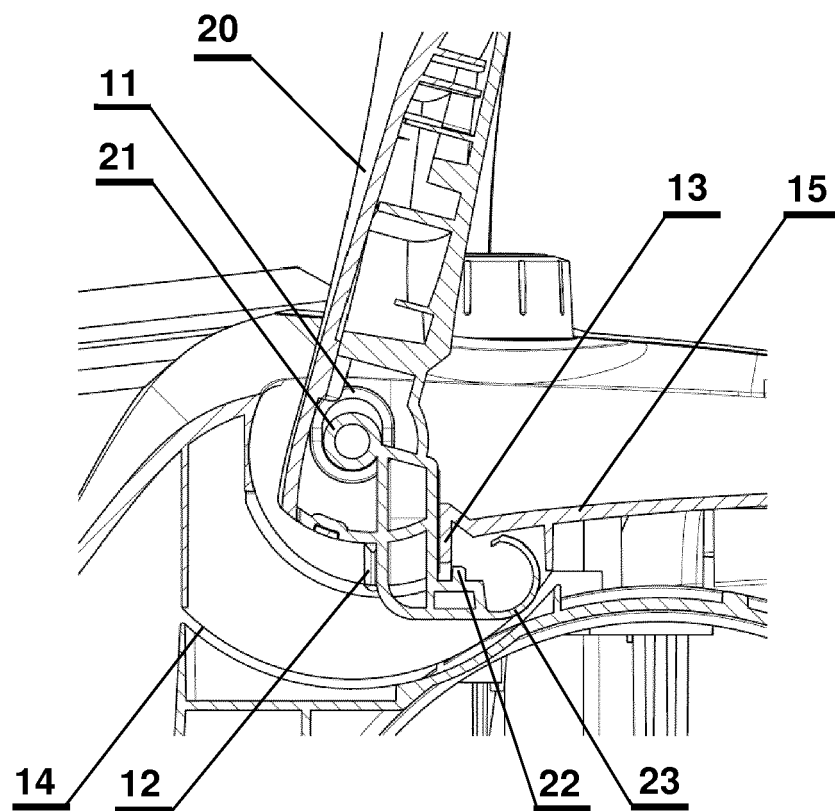


Fig. 3

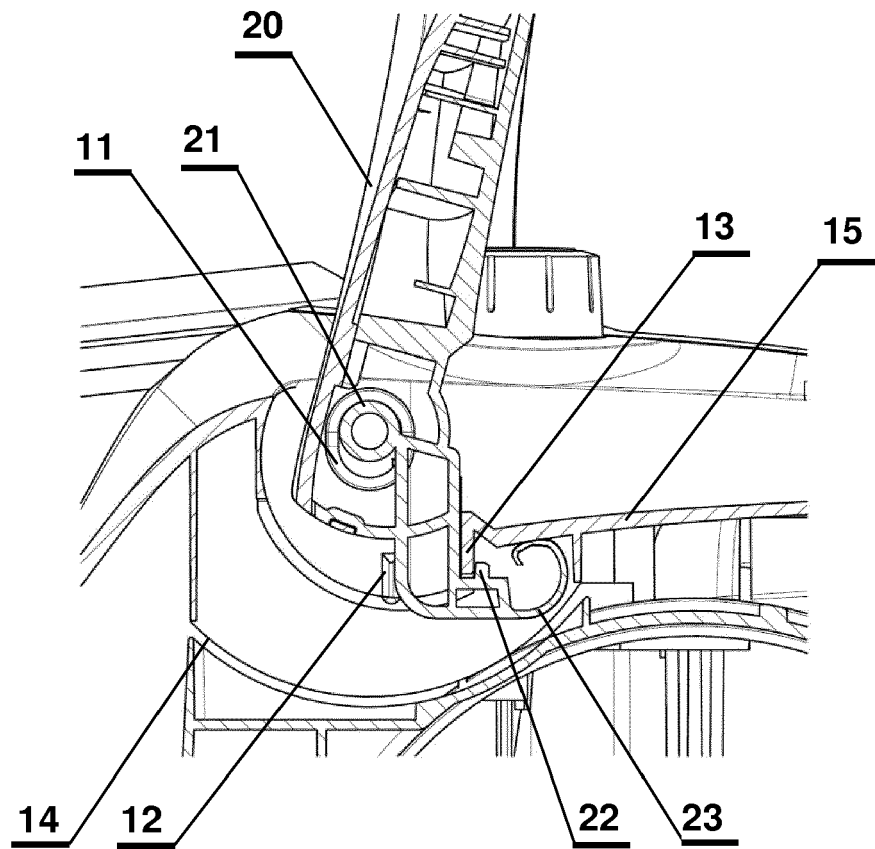
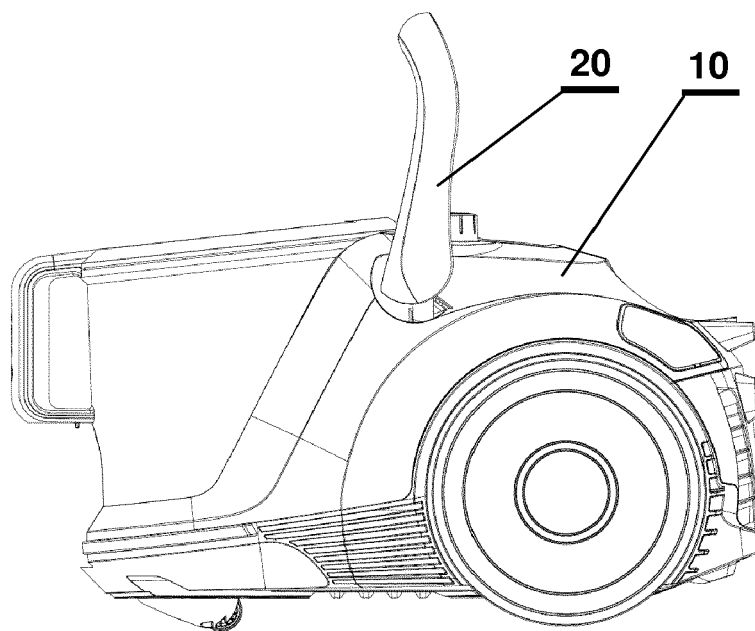


Fig.4





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Application Number
EP 18 19 1258

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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
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