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(54) **Easy to assemble high pressure cleaner**

(57) A high pressure cleaner, comprising in combination a moulded high pressure cleaner chassis (10) comprising an integrally moulded locking protrusion (22), and a handle (40) comprising a locking element (52), whereby the locking element (52) is engaged in a snap fit locking engagement with the locking protrusion (22) when the handle (40) is mounted to the high pressure cleaner chassis (10). A method of assembling the high pressure cleaner is also provided.

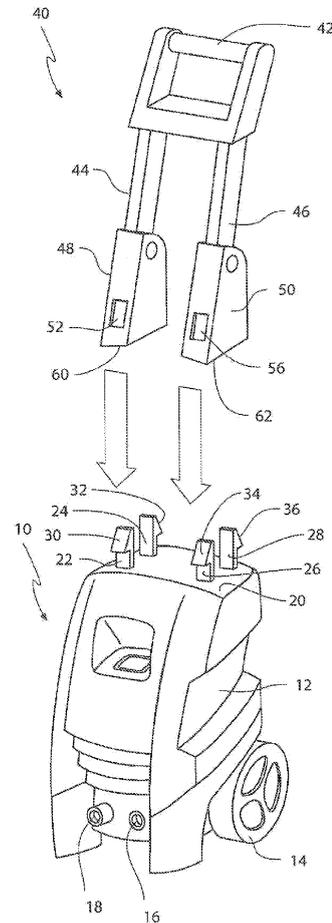


FIG 1A

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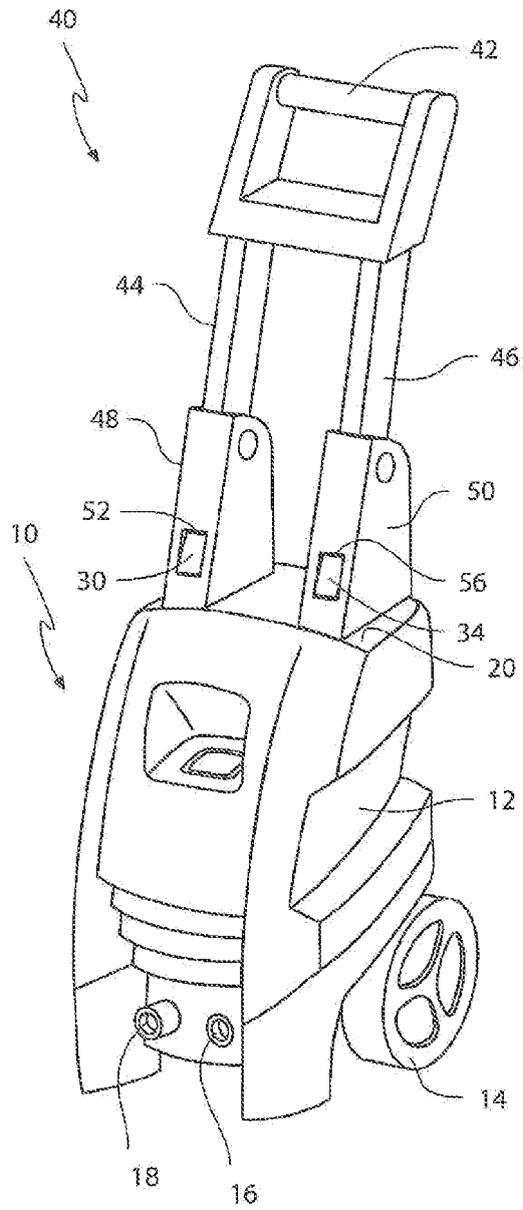


FIG 1B

Description

[0001] The invention relates to a high pressure cleaner and more particularly to means for assembling the cleaner chassis and a handle for maneuvering the cleaner

[0002] Consumer high pressure cleaners, due to their considerable bulk and subsequent requirement for storage space, are often delivered unassembled, thus requiring the end-consumer to assemble the high pressure cleaner. The assembly typically consists of attaching a handle part, for easily handling the high pressure cleaner, to the high pressure cleaner chassis which contains the pump and the inlets and outlets for water and pressurized water respectively. The attachment procedure may involve the use of screws and/or nuts and bolts/butterfly nuts, and thus requires the end-consumer to not only possess the knowledge necessary for operating such fastening devices, but also access to proper tools in order to successfully assemble the high pressure cleaner. With the growing popularity of high pressure cleaners, new, possibly un-experienced, end-consumers are everyday faced with the daunting task of assembling high pressure cleaners, and unless successful at this task require assistance from the resellers of the high pressure cleaner product, or in extreme cases demand to return the unassembled high pressure cleaner to the reseller or manufacturer for a refund. Although manufacturers of high pressure cleaner product continuously strive to increase the customer satisfaction of their products, the mere inclusion of multiple loose part such as screws or bolts etc. in their products result in an increased risk of one or more of those loose parts being accidentally omitted from being delivered with the high pressure cleaner product. This inevitably causes frustration for the end-consumer which will have to contact the reseller or manufacturer of the high pressure cleaner product to obtain the missing parts, or alternatively will be forced to find substitute parts from elsewhere, with the added disadvantage that the safety for the end-consumer may be compromised when using the high pressure cleaner without the missing parts, or alternatively when the substitute parts found by the end-consumer are incompatible or dangerous to use with the high pressure cleaner.

[0003] Techniques related to handles for high pressure cleaners or other bulky consumers machines are known from amongst others US20060102212, US6935642 and US20080245425.

[0004] The above described techniques are burdensome to use, and may additionally require two persons to assemble. Further, where the handle may be easily instated this may be accompanied by a less secure connection between handle and machine.

[0005] It is an object of the present invention to simplify the assembly of a high pressure cleaner.

[0006] It is a further object of the present invention to reduce the number of components required for a high pressure cleaner.

[0007] It is yet a further object of the present invention

to increase the stability by which a handle is mounted to a high pressure cleaner chassis.

[0008] It is another object of the present invention to decrease the material needed for achieving a connection between a handle and a high pressure cleaner chassis.

[0009] It is yet another object of the present invention to reduce the cost of a high pressure cleaner.

[0010] The above objects, as well as numerous further objects which will be evident from the following detailed description of preferred embodiments of the locking assembly according to the present invention are according to a first aspect of the present invention obtained by a high pressure cleaner, comprising in combination:

a moulded high pressure cleaner chassis comprising at least one integrally moulded locking protrusion, and
a handle comprising a locking element, whereby the locking element is engaged in a snap fit locking engagement with a respective locking protrusion when the handle is mounted to the high pressure cleaner chassis.

[0011] The high pressure cleaner may be a consumer high pressure cleaner which, in the context of the present invention is to be understood as comprising high pressure cleaners delivering a fluid at a maximum pressure below 200 bar.

[0012] The high pressure cleaner chassis may house a high pressure pump.

[0013] The high pressure cleaner chassis may be supported by rotatable wheels, which is advantageous as it allows the high pressure cleaner to be more easily moved.

[0014] The locking protrusion may be provided anywhere on the high pressure cleaner chassis but is preferably provided on an upper part of the high pressure cleaner chassis.

[0015] The integrally moulded locking protrusion may be moulded by using a single mould for the high pressure cleaner chassis or the part of the high pressure cleaner chassis and the locking protrusion, or alternatively by using a first mould for moulding the high pressure cleaner chassis and positioning a second mould for the locking protrusion in contact with the moulded pressure chassis whereby the locking protrusion is moulded to the high pressure cleaner chassis.

[0016] The handle may comprise a grip part, for gripping with a hand, connected to the locking element by an elongate member.

[0017] In the context of the present invention the term non-releasingly is to be understood as not releasing when only applying a force to the handle, instead requiring additional application of force, for example to the locking element or the locking protrusion or both, in concert with the application of force to the handle for releasing. This is advantageous as it prevents the handle from being accidentally released from the high pressure cleaner

chassis, yet still allowing the selective release of the handle, for example for storing the high pressure cleaner.

[0018] It is further contemplated within the context of the present invention that the term non-releasingly could also be understood as releasing only when multiple un-

[0019] In the context of the present invention the term snap fit engagement is to be understood as a mechanical joint system where attachment between two parts is achieved by a locking feature on each of the parts, one or both of the locking features being flexible and being deflected due to the contact between the locking features during the attachment procedure, the one or both flexible locking features returning to un-deflected state once the attachment procedure is finished to provide the interference required to attach the parts together.

[0020] The deflection may be any elastic deformation such as sending, e.g. in a cantilever snap fit, twisting, e.g. in a torsional snap fit, and stretching, e.g. in an annular snap fit. The snap fit engagement may in addition comprise inflexible locator features providing stability to the attachment once the locking features have engaged to provide the interference required to attach the parts together.

[0021] In one preferred embodiment of the high pressure cleaner according to the first aspect of the present invention the snap fit engagement comprises a cantilever snap fit

[0022] This is advantageous as it allows a simple release of the handle from the high pressure cleaner chassis by the application of force to the locking protrusion.

[0023] In one embodiment of the high pressure cleaner according to the first aspect of the present invention the snap fit engagement comprises an annular snap fit.

[0024] In the context of the present invention the term annular snap fit is to be understood as a snap fit engagement wherein the locking features comprise concentric ridges on cylinders, the ridges providing the interference required to attach the parts together

[0025] This is advantageous as an annular snap fit constrains the motion between the handle and the high pressure cleaner chassis in five dimensions, i.e. movement in three dimensions, bending in two dimensions, thus increasing the stability of the snap fit.

[0026] In one embodiment of the high pressure cleaner according to the first aspect of the present invention the snap fit engagement comprises a torsional snap fit.

[0027] In the context of the present invention the term torsional snap fit is to be understood as a snap fit engagement wherein one or both of the locking features twist during the attachment procedure.

[0028] This is advantageous as a torsional snap fit may be released by application of torsional force to the handle or the high pressure cleaner chassis, thus allowing the release of the handle from the high pressure cleaner chassis without requiring direct application of force to the locking protrusion or the locking element

[0029] In one preferred embodiment of the high pres-

sure cleaner according to the first aspect of the present invention the locking protrusion is resilient.

[0030] This is advantageous as a resilient locking protrusion can engage with a non-flexible locking element in the handle, thus allowing the handle to be made from non-flexible plastic, which increases the stability of the handle.

[0031] In one preferred embodiment of the high pressure cleaner according to the first aspect of the present invention the high pressure cleaner chassis comprises two locking protrusions and the handle comprises two locking elements corresponding to the locking protrusions.

[0032] This is advantageous as it allows the handle to be attached to the high pressure cleaner chassis at two points, thus increasing the stability of the attachment.

[0033] In one embodiment of the preferred embodiment of the high pressure cleaner according to the first aspect of the present invention above the locking protrusions are grouped together and positioned opposite each other.

[0034] This is advantageous as it reduces the material needed to accomplish the snap fit engagement as the locking protrusions serve to constrain the motion between the handle and the high pressure cleaner chassis in six dimensions.

[0035] In one preferred embodiment of the high pressure cleaner according to the first aspect of the present invention the high pressure cleaner chassis comprises four locking protrusions equally divided into two spaced apart groups, the locking protrusions in each group being positioned opposite each other, and the handle comprising four locking elements corresponding to the locking protrusions.

[0036] This is advantageous as it increases the stability of the attachment between the handle and the high pressure cleaner chassis.

[0037] In one preferred embodiment of the high pressure cleaner according to the first aspect of the present invention the handle comprises a channel enterable by the locking protrusion.

[0038] This is advantageous as the channel protects the locking protrusion when the handle is attached to the high pressure cleaner chassis.

[0039] In one preferred embodiment of the high pressure cleaner according to the first aspect of the present invention the channel is inwardly tapering.

[0040] This is advantageous as it provides a guiding function which facilitates the positioning of the handle and the locking element relative to the locking protrusion during attachment of the handle to the high pressure cleaner chassis, further it decreases the force needed for deflecting the locking protrusion, thus further facilitating the attachment and allowing the use of a stiffer locking protrusion requiring a higher force to deflect, which may render the stiffer locking protrusion more resistant to impacts as the high pressure cleaner is transported or shipped in disassembled, i.e. with the handle detached

from the high pressure cleaner chassis, state.

[0041] In one embodiment of preferred embodiments of the high pressure cleaner according to the first aspect of the present invention the locking protrusion comprises a deflectable beam comprising a first end joined to the pressure cleaner chassis and a second end opposite the first end, the second end comprising a perpendicular hook, and the locking element comprising an aperture, or alternatively a recess, engageable by the hook.

[0042] This is advantageous as the locking protrusion is easily manipulated, by applying force to the hook or the beam, causing the beam to deflect for detachment of the handle from the high pressure cleaner chassis.

[0043] The recess may comprise a through-going smaller than the recess, the trough-going hole providing a channel for applying force to the hook using a stiff thin elongate object such as a length of wire, a screwdriver having a narrow tip, or a needle. This is advantageous as it further protects the hook when the handle is attached to the high pressure cleaner chassis and lessens the risk of unintentional detachment of the handle from the high pressure cleaner chassis.

[0044] The hook preferably comprises a tapering point extending axially to the beam and barb surface extending perpendicularly to the beam.

[0045] In one preferred embodiment of the high pressure cleaner according to the first aspect of the present invention the handle is moulded and the locking element is integrally moulded with the handle.

[0046] This is advantageous as it makes the production of the handle less expensive, faster, and simpler.

[0047] In one preferred embodiment of the high pressure cleaner according to the first aspect of the present invention the high pressure cleaner chassis is injection moulded.

[0048] This is advantageous as it makes the production of the high pressure cleaner chassis less expensive, faster, and simpler.

[0049] In one preferred embodiment of the high pressure cleaner according to the first aspect of the present invention the high pressure cleaner chassis and the handle are made of plastic.

[0050] This is advantageous as it reduces the need for incorporating multiple kinds of materials in the high pressure cleaner, thus making the production of the high pressure cleaner chassis and the handle less expensive, faster, and simpler.

[0051] The high pressure cleaner according to the first aspect of the present invention does not require additional fastening means or other loose parts for assembly, thus the number of components required for the high pressure cleaner is reduced.

[0052] The high pressure cleaner according to the first aspect of the present invention has a handle non-releasably mounted to the high pressure cleaner chassis, thus the stability by which the handle is mounted to the high pressure cleaner chassis is increased.

[0053] The high pressure cleaner according to the first

aspect of the present invention has locking protrusions integrally molded with the high pressure cleaner chassis, thus the material needed for achieving the connection between the handle and the high pressure cleaner chassis is reduced.

[0054] In preferred embodiments of the high pressure cleaner according to the first aspect of the present invention the high pressure cleaner chassis and/or the handle are moulded, thus the cost of the high pressure cleaner is reduced.

[0055] According to a second aspect of the high pressure cleaner according to the present invention a method of assembling a high pressure cleaner is provided comprising the steps of:

providing a high pressure cleaner according to the first aspect of the present invention, and, mounting the handle to the high pressure cleaner chassis, whereby the locking element becomes engaged in a snap fit locking engagement with the locking protrusion.

[0056] The method according to the second aspect of the high pressure cleaner according to the present invention allows a high pressure cleaner to be assembled by a single person without requiring assistance from further persons, without requiring any tools, and without involving additional components, thus simplifying the assembly of the high pressure cleaner.

[0057] The invention and its many advantages will be described in more detail below with reference to the accompanying schematic drawings which for the purpose of illustration show some non-limiting embodiments and in which

Fig. 1 shows a handle and a high pressure cleaner chassis according to an embodiment of the present invention, and

Fig. 2 shows in cross section the locking mechanism according to an embodiment of the present invention.

[0058] Fig. 1A shows a high pressure cleaner chassis, in its whole designated the reference numeral 10, and a handle, in its whole designated the reference numeral 40, according to an embodiment of the present invention. The high pressure cleaner chassis 10 comprises a body, designated the reference numeral 12, housing a pump, not shown and being equipped with wheels, one of which is shown and designated the reference numeral 14, inlets and outlets for water, designated the reference numeral 16 and 18, respectively, and an upper portion, designated the reference numeral 20, which comprises four perpendicularly mounted locking tongues, designated the reference numerals 22, 24, 26 and 28, respectively, grouped into two spaced apart groups, each locking tongue 22, 24, 26 and 28 comprising a wedge-shaped hook part,

designated the reference numeral 30, 32, 34 and 36 respectively, the hook part 30 being oriented oppositely to the hook part 32 and the hook part 34 being oriented oppositely to the hook part 36. The handle 40, which in fig. 1A is not yet mounted to the high pressure cleaner chassis 10, comprises a grip part, designated the reference numeral 42, and two legs, designated the reference numerals 44 and 46 respectively. Each leg, 44, 46, comprises at the end opposite the grip part 42 a socket part, designated the reference numerals 48 and 50, respectively, comprising socket openings, designated the reference numerals 60 and 62, respectively, each socket opening 60, 62 being enterable by the corresponding locking tongues 22, 24 and 26, 28 respectively.

[0059] The socket parts 48, 50 comprises four apertures, designated the reference numerals 52, 54, 56 and 58, 52 and 54 being shown in fig. 1A-1B and 56 and 58 being positioned opposite the apertures 52 and 54, respectively, and thus not shown in fig. 1, whose function will be described in more detail in relation to fig. 2.

[0060] In fig. 1B the handle 40 has been attached to the high pressure cleaner chassis 10 whereby the hook parts 30, 32 (not shown in fig. 1B), 34 and 36 (not shown in fig. 1B) engage the apertures 52, 54 (not shown in fig 1B), 56 and 58 (not shown in fig 1B) to retain the handle 40 attached to the high pressure cleaner chassis 10.

[0061] Fig. 2A shows in cross section the locking mechanism according to an embodiment of the present invention. The locking mechanism comprises the locking tongues, 22 (not shown in fig 2A-B), 24 (not shown in fig 2A-B), 26 and 28, the hook parts 30 (not shown in fig 2A-B), 32 (not shown in fig 2A-B), 34, 36, and the apertures 52 (not shown in fig 2A-B), 54 (not shown in fig 2A-B), 56 and 68. Further the socket opening 60 (not shown in fig 2A-B) and 62 are inwardly tapering below the apertures 52, 54, 56 and 58.

[0062] The process of mounting the handle 40 to the high pressure cleaner chassis 10 is hereinafter described with reference to figure 2A, however the same process takes place between the locking tongues 22, 24, and the apertures 52, 56 of socket 48.

[0063] As the handle 10 is forced into attachment with the high pressure cleaner chassis 10 the locking tongues 26 and 28 enter the socket opening 62 whereby the hook parts 34 and 36 contact the tapering inner walls of the socket opening 62, causing the locking tongues 26 and 28 to deflect towards each other. Fig 2A shows an intermediate: stage in the attachment process where the locking tongues 26 and 26 are deflected, but the socket part 50 has not yet been brought sufficiently far down onto the locking tongues 26 and 28 to allow the hook parts 34 and 36 to engage the apertures 56 and 58.

[0064] In fig 2B the socket part 50 has reached its proper position contacting the upper portion 20 of the high pressure cleaner chassis 10. The locking tongues 26 and 28 have returned to their non-deflected state as the apertures 54 and 58 have accommodated the hook parts 34 and 36, thus securely locking the handle 40 to the

high pressure cleaner chassis 10. Subsequently the hook parts 34 and 36 prevent any unwanted disassembly of the handle 40 from the high pressure cleaner chassis 10, as the application of force onto the hook parts 34, 36, is required for deflection of the locking tongues 26 and 28 so that the hook parts 34 and 36 becomes disengaged from the apertures 56 and 58 before the handle 40 may be detached from the high pressure cleaner chassis 10 by lifting it away from the locking tongues.

[0065] When the handle 40 is attached to the high pressure cleaner chassis 10 as shown in fig. 1B and fig. 2B, the stability of the attachment is provided by the contact between the walls of the socket opening 62 and the upper portion 20 of the high pressure cleaner chassis 10 and the locking tongues 26 and 28.

[0066] Although four locking tongues 22, 24, 26, and 28 are shown in figs. 1-2, additional or fewer locking tongues may be used. Further, the tacking tongues and the apertures 52, 54, 56 and 58 may switch place so that the locking tongues are provided on the handle 40 and the apertures are provided in the high pressure cleaner chassis 10. Further the hook parts 30, 32, 34, and 36 may be shaped otherwise as long as the contact between the socket opening 60, 62 and the hook parts causes the locking tongues to deflect 22, 24, 26, and 28, and as long as the hook parts engage the apertures 52, 54, 56 and 58 to prevent detachment of the handle front the high pressure cleaner chassis unless the locking tongues are intentionally deflected as described above with reference to fig. 2B.

[0067] List of parts with reference to the figures

10. High pressure cleaner chassis
12. Body
14. Wheel
16. Inlet
18. Outlet
20. Upper portion
22. Locking tongue (first)
24. Locking tongue (second)
26. locking tongue (third)
28. Locking tongue (fourth)
30. Hook part (first)
32. Hook part (second)
34. Hook part (third)
36. Hook part (fourth)
40. Handle
42. Grip part
44. Leg (first)
46. Leg (second)

(continued)

48. Socket part (first)
50. Socket part (second)
S2. Aperture (first)
54. Aperture (second)
56. Aperture (third)
58. Aperture (fourth)
60. Socket opening (first)
62. Socket opening (second)

Claims

1. A high pressure cleaner, comprising in combination:

a moulded high pressure cleaner chassis (10) comprising at least one integrally moulded locking protrusion (22), and a handle (40) comprising a locking element (62), whereby said locking element (52) engaged in a snap fit locking engagement with a respective locking protrusion (22) when said handle (40) is mounted to said high pressure cleaner chassis (10).

2. The high pressure according to claim 1, said snap fit engagement comprising a cantilever snap fit.

3. The high pressure cleaner according to claim 1, said snap fit engagement comprising an annular snap fit.

4. The high pressure cleaner according to claim 1, said snap fit engagement comprising a torsional snap fit.

5. The high pressure cleaner according to any preceding claim, said locking protrusion (22) being resilient,

6. The high pressure cleaner according to any preceding claim, said high pressure cleaner chassis comprising two locking protrusions (22, 26) and said handle comprising two locking elements (52, 56) corresponding to said locking protrusions (22, 26),

7. The high pressure cleaner according to claim 6, said locking protrusions (22, 24) being grouped together and positioned opposite each other.

8. The high pressure cleaner according to any preceding claim, said high pressure cleaner chassis (10) comprising four locking protrusions (22, 24, 26, 28) equally divided into two spaced apart group, said locking protrusions (22, 34, 26, 28) in each group being positioned opposite each other; and said handle (40) comprising four locking elements (52, 54,

56, 58) corresponding to said locking protrusions (22, 24, 26, 28).

9. The high pressure cleaner according to any preceding claim, said handle (40) comprising a channel (60) enterable by said locking protrusion (22).

10. The high pressure cleaner according to claim 9, said channel (60) being inwardly tapering.

11. The high pressure cleaner according to any of the claims 1-2, 5-10 said locking protrusion (22) comprising a deflectable beam comprising a first end joined to said pressure cleaner chassis (10) and a second end opposite said first end, said second end comprising a perpendicular hook (30), and said locking element (50) comprising an aperture, or alternatively a recess, engageable by said hook (30).

12. The high pressure cleaner according to any preceding claim, said handle (40) being moulded and said locking element (52) being integrally moulded with said handle (40).

13. The high pressure cleaner according to any preceding claim, said high pressure cleaner chassis (10) being injection moulded.

14. The high pressure cleaner according to any preceding claim, said high pressure cleaner chassis (10) and said handle (40) being made of plastic.

15. A method of assembling a high pressure cleaner comprising the steps of:

providing a high pressure cleaner according to any preceding claim, and, mounting said handle (40) to said high pressure cleaner chassis (10), whereby said locking element (52) becomes engaged in a snap fit locking engagement with said locking protrusion (22).

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

1. A high pressure cleaner, comprising in combination:

a high pressure cleaner chassis (10) comprising at least two resilient locking protrusions (22, 26), said chassis (10) and said locking protrusions (22, 26) being integrally formed by moulding, and

a handle (40) comprising two locking elements (52, 56), whereby each of said locking elements (52, 56) is engaged in a snap fit locking engagement with a respective locking protrusion (22,

26) when said handle (40) is mounted to said high pressure cleaner chassis (10).

2. The high pressure cleaner according to claim 1, said snap fit engagement comprising a cantilever snap fit. 5

3. The high pressure cleaner according to claim 1, said snap fit engagement comprising an annular snap fit. 10

4. The high pressure cleaner according to claim 1, said snap fit engagement comprising a torsional snap fit. 15

5. The high pressure cleaner according to any of claims 1-4, said locking protrusions (22, 24) being grouped together and positioned opposite each other. 20

6. The high pressure cleaner according to any preceding claim, said high pressure cleaner chassis (10) comprising four locking protrusions (22, 24, 26, 28) equally divided into two spaced apart groups, said locking protrusions (22, 24, 26, 28) in each group being positioned opposite each other, and said handle (40) comprising four locking elements (52, 54, 56, 58) corresponding to said locking protrusions (22, 24, 26, 28). 25
30

7. The high pressure cleaner according to any preceding claim, said handle (40) comprising a channel (60) enterable by said locking protrusion (22). 35

8. The high pressure cleaner according to claim 7, said channel (60) being inwardly tapering. 40

9. The high pressure cleaner according to any of the claims 1-2, 5-8, said locking protrusion (22) comprising a deflectable beam comprising a first end joined to said pressure cleaner chassis (10) and a second end opposite said first end, said second end comprising a perpendicular hook (30), and said locking element (50) comprising an aperture, or alternatively a recess, engageable by said hook (30). 45

10. The high pressure cleaner according to any preceding claim, said handle (40) and said locking element (52) being integrally formed by moulding. 50

11. The high pressure cleaner according to any preceding claim, said high pressure cleaner chassis (10) being injection moulded.

12. The high pressure cleaner according to any preceding claim, said high pressure cleaner chassis (10) and said handle (40) being made of plastic. 55

13. A method of assembling a high pressure cleaner comprising the steps of:

providing a high pressure cleaner according to any preceding claim, and,
mounting said handle (40) to said high pressure cleaner chassis (10), whereby said locking element (52) becomes engaged in a snap fit locking engagement with said locking protrusion (22).

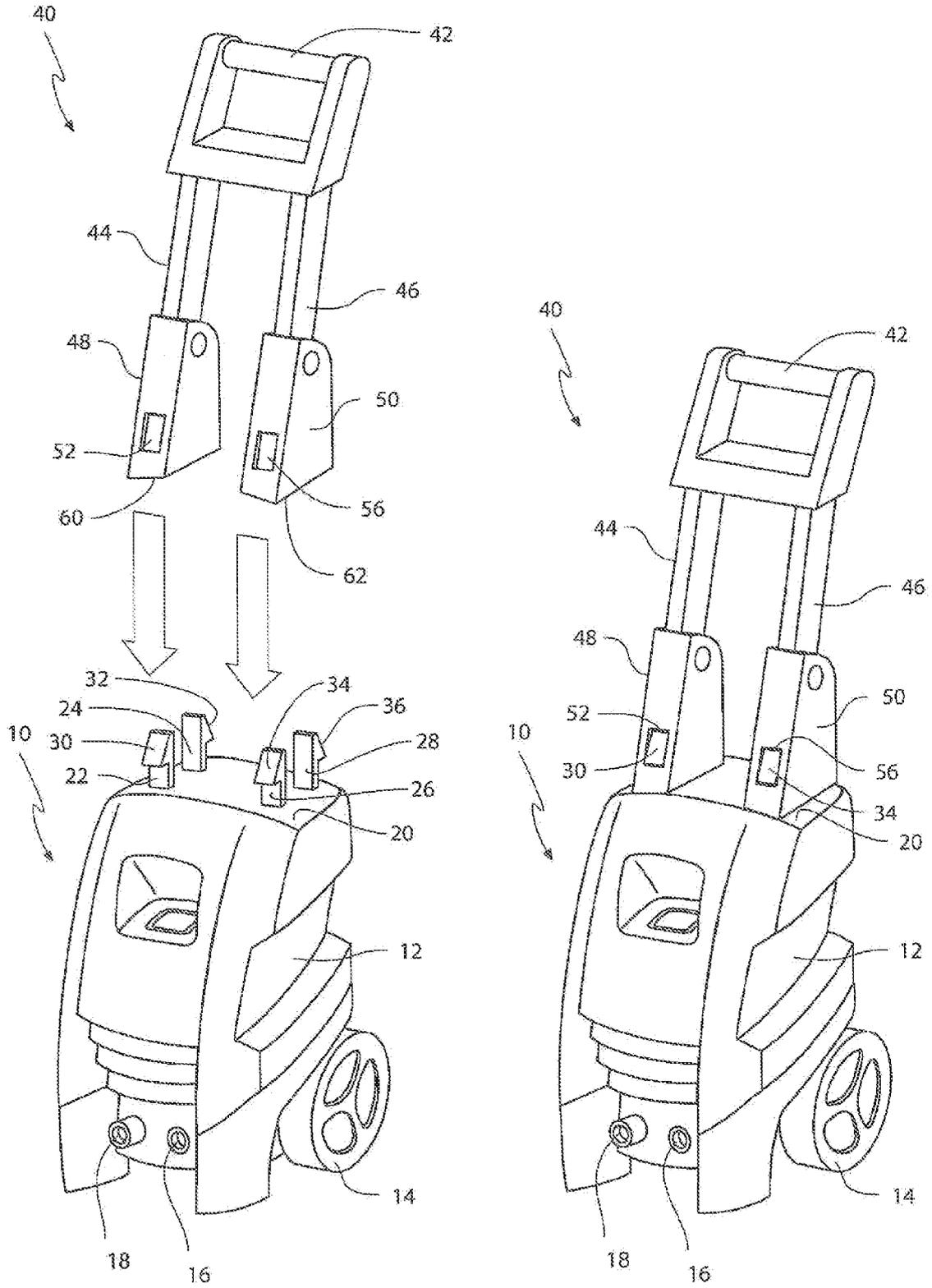


FIG 1A

FIG 1B

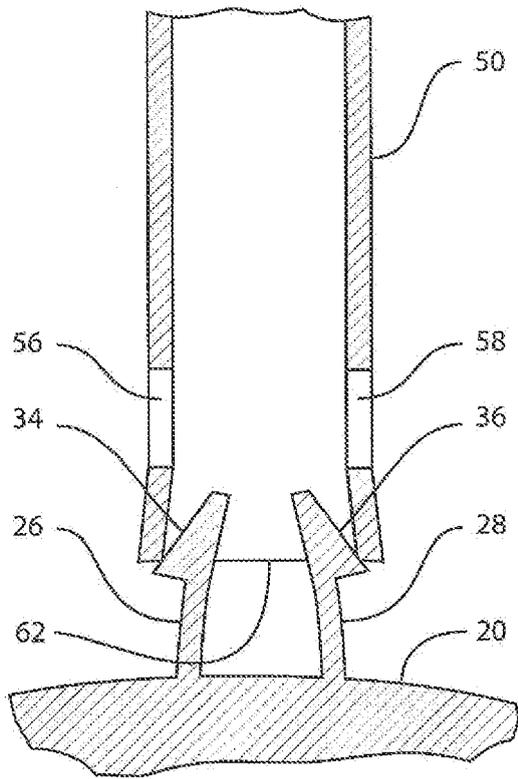


FIG. 2A

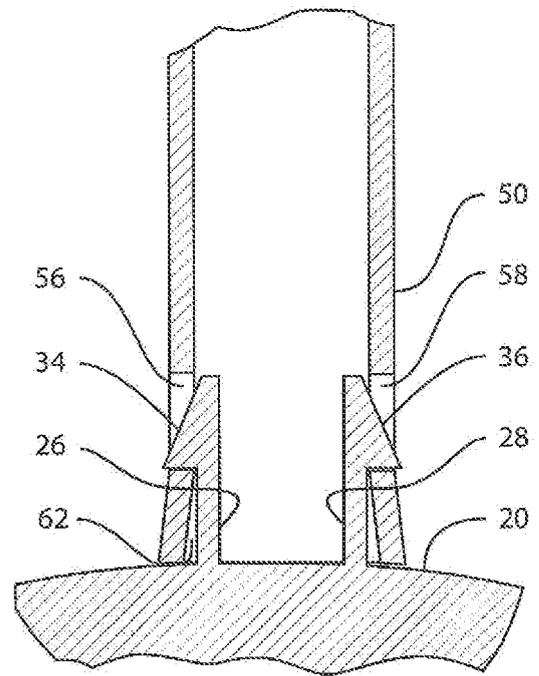


FIG. 2B



EUROPEAN SEARCH REPORT

Application Number
EP 10 15 2203

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X,D A	US 2008/245425 A1 (ALEXANDER GUS [US]) 9 October 2008 (2008-10-09) * abstract; figures * * paragraph [0029] - paragraph [0033] * -----	1-7,9, 10,12-14 8,11	INV. B08B3/02
X,D A	US 6 935 642 B1 (CRAIG SCOTT [US] ET AL) 30 August 2005 (2005-08-30) * abstract; figures 1-4,6 * * column 2, line 30 - column 4, line 62 * -----	1,5-7,9, 10,12, 13,15 8,11	
A	US 5 836 519 A (BROWN ROBERT S [US]) 17 November 1998 (1998-11-17) * abstract; figure 4 * * column 2, line 50 - column 4, line 60 * -----	1-15	
			TECHNICAL FIELDS SEARCHED (IPC)
			B08B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 14 July 2010	Examiner Plontz, Nicolas
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	

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EPO FORM 1503 03.02 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 10 15 2203

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.

14-07-2010

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US 2008245425 A1	09-10-2008	WO 2008124082 A1	16-10-2008
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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