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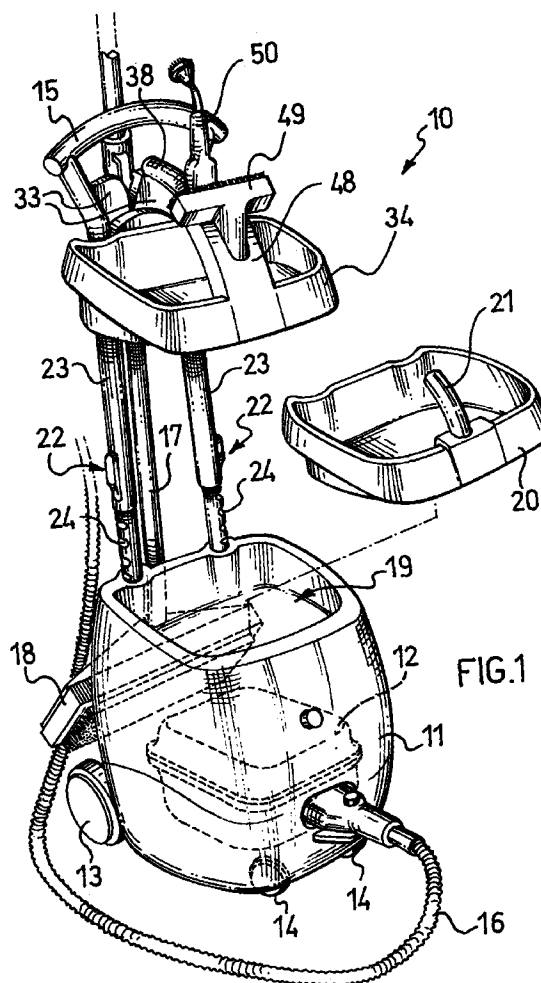
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(54) **Cleaning apparatus**

(57) In cleaning apparatus (10) having a body (11) which contains the main parts of the apparatus, having at least one handle (15) and wheels (13,14) for the transportation of the apparatus to the areas to be cleaned, the apparatus also having a flexible hose (16) which extends from the body (11) and a cleaning tool (17,18) connected to the flexible hose (16), there is provision for variation of the height of the handle (15) to permit convenient and precise transportation of the apparatus. Further, a container (34) can be connected to the handle (15) for holding the accessories of the cleaning apparatus (10). This container (34) can also act as a lid for a compartment (19) formed in the body (11) of the apparatus (10). In another embodiment, the cleaning apparatus is a steam cleaning apparatus (60). This apparatus (60) comprises a compartment (75) for housing a steam iron (77) connected to the steam output pipe of the apparatus (60).



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Description

[0001] The present invention relates to cleaning apparatus in general, for example, to a steam cleaner or a vacuum cleaner.

[0002] Apparatus of this type normally comprises a body containing the main parts of the apparatus and a flexible hose which extends from the body and the free end of which is connected to a tool to be directed towards the surface to be cleaned. The body normally has at least one handle and wheels for the transportation of the apparatus to the areas to be cleaned.

[0003] In most situations, the operator pulls the apparatus along by exerting a pull on the hose since, during use, the operator grips the tool on the end of the hose and it is therefore convenient and natural to move the apparatus in this way. However, given the flexibility of the hose, this method of moving the apparatus does not permit very precise steering and it is therefore not easy to avoid obstacles, with the result that the body of the apparatus knocks or stops against them. At this point, the operator normally has to bend over the apparatus, grip it by the handle and move it so as to release it from the obstacle. This clearly constitutes a nuisance for the operator.

[0004] Moreover, pulling the apparatus along by gripping it by the handle of the body is not convenient since it forces the operator to stand in a bent position.

[0005] The object of the present invention is to prevent the aforementioned problems.

[0006] This object is achieved by means of cleaning apparatus in general, comprising a body containing the main parts of the apparatus and having at least one handle and wheels for the transportation of the apparatus to the areas to be cleaned, the apparatus further comprising a flexible hose which extends from the body and the free end of which is connected to a tool to be directed towards the surface to be cleaned, the apparatus being characterized in that it comprises means for varying the height of the handle.

[0007] For a better understanding of the invention, embodiments thereof are described by way of non-limiting example below and are illustrated in the appended drawings, in which:

Figure 1 is a front perspective view of steam-cleaning apparatus according to the invention with one element exploded,

Figures 2 and 3 show the operation of a detail of the apparatus of Figure 1, in longitudinal section,

Figure 4 is an exploded view showing further details of the apparatus of Figure 1,

Figure 5 shows a variant of the apparatus of Figure 1 in a perspective view from the rear, with some elements exploded,

Figure 6 shows the apparatus of Figure 5 in the rest position,

Figure 7 shows further steam-cleaning apparatus

according to the invention in a front perspective view,

Figure 8 is an exploded view of a detail of the apparatus of Figure 7, and

Figure 9 shows the operation of a further detail of the apparatus of Figure 7.

[0008] The steam-cleaning apparatus or steam cleaner generally indicated 10 in Figure 1 comprises a body 11 which contains the main parts of the apparatus and, in particular, the steam-generating boiler, the solenoid valve for activating or de-activating steam regulation, the pressure switch for keeping the boiler pressure at the predetermined value and the safety valve. Of these parts, only the boiler, indicated 12, is shown.

[0009] The body 11 has a pair of large rear wheels 13 rotatable about a common horizontal axis and a pair of small front swivelling wheels 14. The body also has a handle 15.

[0010] The apparatus 10 also comprises a flexible hose 16 which extends from the body 15 and the free end of which is connected to a tool to be directed towards the surface to be cleaned. In the embodiment shown, the tool is a rigid tube 17 with a brush-like head 18 from which steam emerges when a suitable control is operated.

[0011] A compartment 19 formed in the body 11 is closed by a suitably-shaped lid 20 which is hollow on top and also acts as a container having a handle 21 by which it can be gripped and moved. Various accessories, for example, further tools to be connected to the hose instead of the tool described, may be placed in the compartment 19.

[0012] The handle 15 is disposed in a vertical plane in the vicinity of the vertical plane containing the horizontal axis of the rear wheels 13. Moreover, the handle 15 is connected to the body 11 by means of two pairs of substantially vertical, telescopic, tubular elements 22. Each pair 22 of tubular elements has an outer tubular element 23 which is fixed relative to the handle 15 and in which an inner tubular element 24, fixed relative to the body 11, is mounted for sliding. As shown in Figures 2 and 3, the inner tubular element 24 has a longitudinal series of recesses 25; the outer tubular element 23 has a narrow opening 26 through which a roller 27 extends, the roller 27 being acted on by a slider 28 mounted for sliding on the outer tubular element 23; the slider 28 is kept in a position in which it locks the roller 27 in one of the recesses 25 by means of a spring 29 acting on the slider and reacting against a shoulder 30 which is fixed relative to the outer tubular element 23.

[0013] The handle 15 can thus be raised to the desired height if each slider 28 is moved from the aforementioned position against the action of the spring 29 so as to release the roller 27 and to disconnect the tubular elements 23 and 24 from one another. Once the desired position is reached, the sliders 28 are released and the rollers 27 snap into the recesses 25 corre-

sponding to the desired height of the handle 15.

[0014] As shown in detail in Figure 4, the handle 15 has a cross-member 31 on one side of which there are two hooks 32 and on the opposite of which there is a fork 33. A suitably-shaped container having a bent rear rim 35 for engagement on the hooks 32 can be anchored releasably on the side with the hooks 32; two notches 36 are formed in the rim 35 for coupling with corresponding projections 37 of the hooks 32 in order to lock the container 34 in position; the container 34 also has a handle, indicated 38, by which it can be gripped and moved. The shape of the container 34 is such that the container itself can act as a lid for the compartment 19. The fork 33 also has a dual function; it can be used, as shown in Figure 6, in combination with a lower hook 39 fixed to the body 11, for the winding of the electric cable 40 of the apparatus 10 when the handle 15 is in the lowered position; when the handle 15 is in the raised position, however, the fork 33 can be used for the engagement of the tool connected to the hose 16, as shown in Figure 1.

[0015] Figure 5 shows alternative means for increasing the height of the handle 15. In particular, the handle 15 has, at its lower end, two lower tubular elements 41 which, when the handle 15 is in the lowered position, are fitted in two corresponding cylindrical seats 42 in the body 11. Each tubular element 41 has a resiliently-retractable pin 43 which is coupled with a respective through-hole 44 formed in the seat 42 so that the handle 15 can be connected releasably to the body 11. Two tubular extensions 45 are provided for increasing the height of the handle 15, the tubular elements 41 of the handle 15 being fitted in the extensions 45 at one end whilst the other ends of the extensions 45 are fitted in the seats 42 in the body 11; naturally, each extension 45 has a through-hole 46 which houses the pin 43 of the respective tubular element 41 of the handle 15 and a resiliently-retractable pin 47 which is coupled with the hole 44 of the respective seat 42 of the body 11.

[0016] The ability to increase the height of the handle achieves the advantage that the apparatus 10 can be moved conveniently and at the same time precisely. In fact, the operator grips the handle 15 without having to bend down and, by acting directly on the body 11 of the apparatus by means of the handle and not by means of a flexible hose as in the prior art, can steer the apparatus precisely. When transferring the apparatus from one area to another, the operator will lift up the front portion of the body 11 of the apparatus, pivoting it about the axis of the rear wheels 13 so as to move it on these rear wheels alone, in an inclined position, in a very advantageous transportation configuration.

[0017] In the embodiment of Figure 1 there is the further advantage that the height of the handle 15 can be adjusted to several positions according to the height of the operator.

[0018] The accessories held in the compartment 19 can be placed in the external compartment of the lid 20

and in the container 34, ready for use.

[0019] By virtue of the fact that the handle 15 is extendable in height, the container 34 can be brought to a height such as to afford the operator convenient and direct access to the accessories without bending.

[0020] As shown in Figure 1, the handle 38 is fixed to a wider arm 48 which extends from the container 34 and has holes in which accessories can be fitted, only two of these accessories being shown by way of example, indicated 49 and 50, in the drawing.

[0021] Figure 7 shows further steam-cleaning apparatus, generally indicated 60, in which the body, indicated 61, and the handle, indicated 62, are of different shapes. In this embodiment, the body 61 again houses the boiler, indicated 63, and the other main parts of the apparatus and also has a pair of large rear wheels 64 rotatable about a common horizontal axis and a pair of small swivelling front wheels 65. A flexible hose 78 is also provided, extending from the body 61 with its free end connected to a tool to be directed towards the surface to be cleaned, the tool being constituted by a rigid tube 79 with a brush-like head 80 from which steam emerges when a suitable control is operated. The grip 62 is also telescopically extendable by means of two pairs 66 of tubular elements which can be extended in a precisely adjustable manner, as described for the apparatus of Figure 1.

[0022] In the apparatus 60, as well as being adjustable in height, the handle 62 can also be inclined forwardly or rearwardly about a horizontal axis. For this purpose, as shown in detail in Figure 8, the lower tubular element, indicated 67, of each telescopic pair 66 has, at its free end, a head 68 from which a threaded shank 69 extends through a hole 70 in a shoulder 71 fixed to the body 61, a knob 72 being screwed onto the shank on the opposite side of the shoulder 71 to the head 68. A series of radial recesses 73 is formed in the head 68 and a series of radial projections 74 is correspondingly formed in the shoulder 71 for coupling with the recesses 73. When the knobs 72 are unscrewed, the handle 62 can thus be brought to the desired inclined position, being clamped in this position by the re-tightening of the knobs 72 and also by virtue of the coupling between the projections 74 and the recesses 73. Two adjustments are thus provided for the handle 62, that is, both adjustment in height and adjustment in inclination. This adjustment of the inclination of the handle 62 is advantageous both for even better adaptation of the handle to the operators requirements, and for bringing the handle to a most compact position (inclined forwardly in the embodiment shown), for example, when the apparatus is to be put away.

[0023] The body 61 of the apparatus 60 also has a compartment, indicated 75 in Figure 9, accessible from the exterior through a door 76 which is hinged at the bottom, can be opened by means of an external control, and can be snapped shut. In the embodiment shown, the compartment 75 houses a steam iron 77 which can

be connected to the steam-output pipe of the apparatus.

[0024] Clearly, variations of and/or additions to the embodiments described and illustrated are possible.

[0025] The shape of the apparatus and its components may differ from those shown.

[0026] The handle may be extended in height in a different manner from that shown, for example, by means of folding arms which connect the handle to the body of the apparatus. However, the solutions proposed have been found effective.

[0027] In the apparatus 10 of Figure 1, the handle may be inclinable, as in the apparatus 60 of Figure 7.

[0028] Other means functionally equivalent to those described above may be used for inclining the handle and clamping it in position.

[0029] In the apparatus 10, the container 34 may or may not have a shape such that it can act as a lid for the compartment 19. In the former case, the lid 20 may even be omitted or used as an accessory.

[0030] Moreover, in the apparatus 60, the releasable connection of a container to the handle by suitable means may be considered.

[0031] The shape, size, type (rotatable about a single axis, swivelling, etc.), and arrangement of the wheels may be different from those described and illustrated, although the solution proposed in the examples has been found particularly effective.

[0032] The foregoing description may apply, naturally with modifications, to vacuum cleaners or to cleaning apparatus in general having a body containing the main parts of the apparatus, having a handle and wheels for the transportation of the apparatus to the areas to be cleaned, and having a flexible hose which extends from the body and the free end of which is connected to a tool to be directed towards the surface to be cleaned. The functions will change from one type of apparatus to another, but the advantages mentioned above for the steam cleaners described and illustrated remain the same.

Claims

1. Cleaning apparatus (10; 60) in general, comprising a body (11; 61) containing the main parts of the apparatus and having at least one handle (15; 62) and wheels (13, 14; 64, 65) for the transportation of the apparatus to the areas to be cleaned, the apparatus further comprising a flexible hose (16; 78) which extends from the body (11; 61) and the free end of which is connected to a tool (17, 18; 79, 80) to be directed towards the surface to be cleaned, the apparatus being characterized in that it comprises means (22-30; 41-46; 66) for varying the height of the handle (15; 62).

2. Apparatus according to Claim 1, in which the means for varying the height of the handle (15) comprise telescopic tubular elements (23, 24)

which connect the handle (15) to the body (11), the telescopic tubular elements (23, 24) being lockable relative to one another in any of a series of positions corresponding to extensions in the height of the handle (15).

3. Apparatus according to Claim 2, in which there is at least one pair (22) of telescopic tubular elements (23, 24), the inner tubular element (24) having a longitudinal series of recesses (25) and the outer tubular element (23) having a control operating an element which locks the tubular elements (23, 24) relative to one another by being fitted in any one of the recesses (25).

4. Apparatus according to Claim 3, in which there are two pairs (22) of telescopic tubular elements (23, 24) which connect the handle (15) to the body (11).

5. Apparatus according to Claim 1, in which the means for varying the height of the handle (15) comprise extensions (45) to be interposed between the handle (15) and the body (11).

6. Apparatus according to Claim 5, in which the extensions (45) are tubular.

7. Apparatus according to Claim 6, in which the extensions are coupled with corresponding elements (41, 42) of the body (11) and of the handle (15), with locking by resilient snap-engagement means (43, 44, 46, 47).

8. Apparatus according to any one of the preceding claims, in which the body (11; 61) has a pair of rear wheels (13; 64) rotatable about a common horizontal axis and one or more swivelling front wheel (14; 65), the handle (15, 62) being disposed in a vertical plane coinciding with or in the vicinity of the vertical plane containing the common horizontal axis of the rear wheels (13; 64).

9. Apparatus according to any one of the preceding claims, in which the handle (62) can be inclined forwardly or rearwardly.

10. Apparatus according to Claim 9, in which the handle (62) is articulated to the body (61) and means (68-74) are provided for locking the handle (62) in any one of a series of angular positions.

11. Apparatus according to any one of the preceding claims, in which a container (34) is provided and is connected releasably to the handle (15).

12. Apparatus according to Claim 11, in which the handle (15) and the container (34) are connected releasably by engagement means (31, 32, 35-37).

13. Apparatus according to Claim 11 or Claim 12, in which the handle (15) comprises further engagement means (33) for the tool (17, 18) connected to the flexible hose (16) of the apparatus (10).

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14. Apparatus according to any one of Claims 11, 12 and 13, in which the body (11) has an internal compartment (19) and the container (34) also constitutes the lid of the compartment (19).

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15. Apparatus according to any one of the preceding claims for cleaning with steam delivered through the flexible hose (78), in which the body (61) comprises an internal compartment (75) accessible from the exterior and housing a steam iron (77) for connection to the flexible hose (78).

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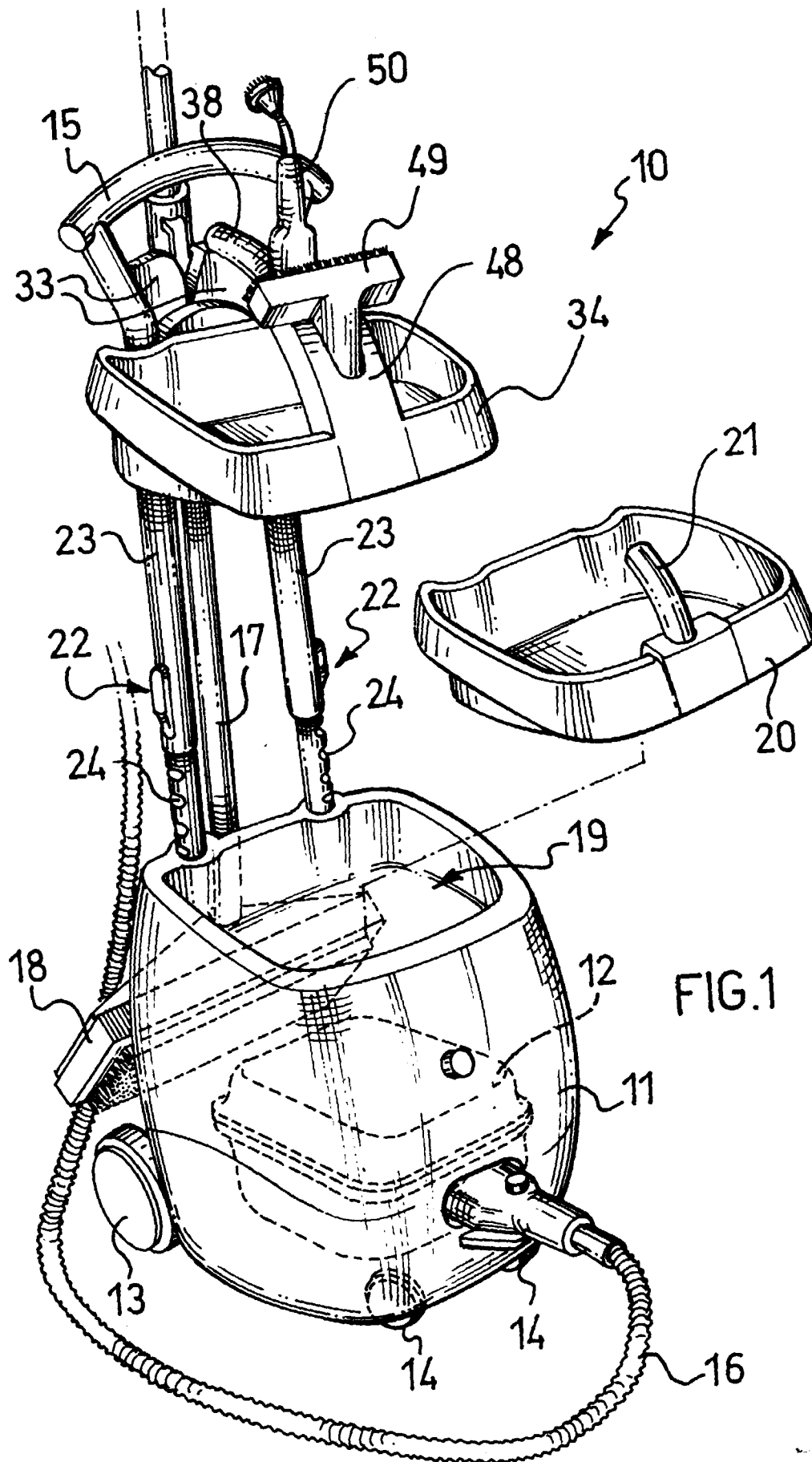
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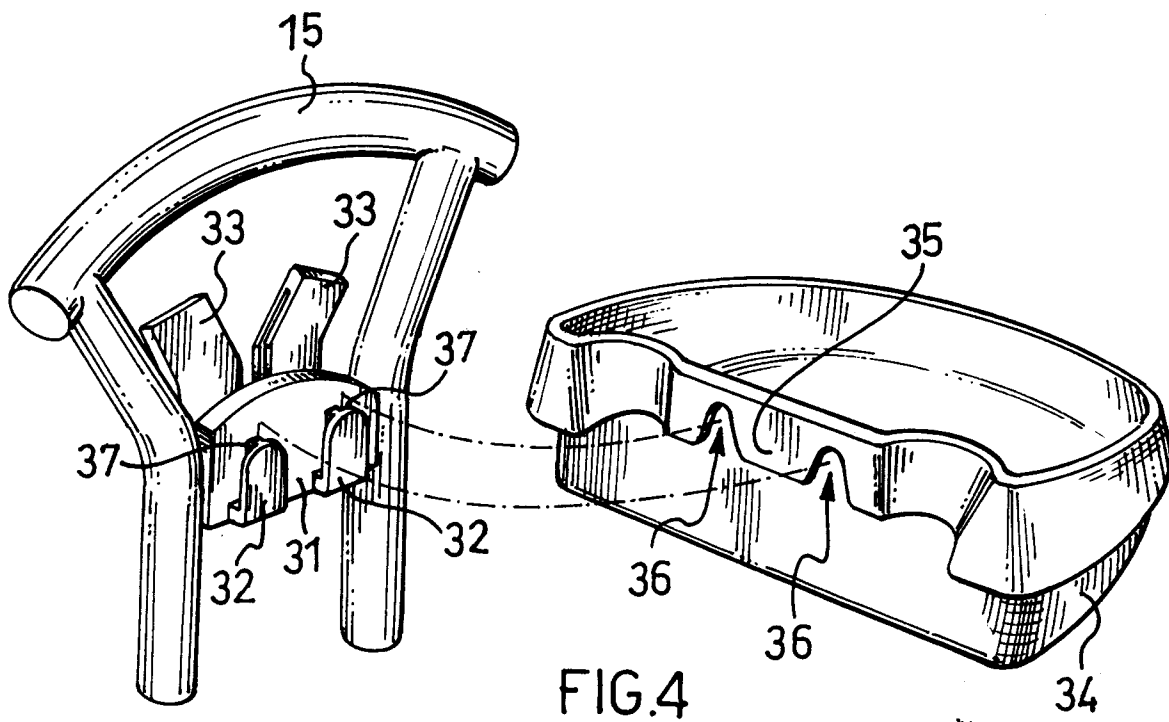
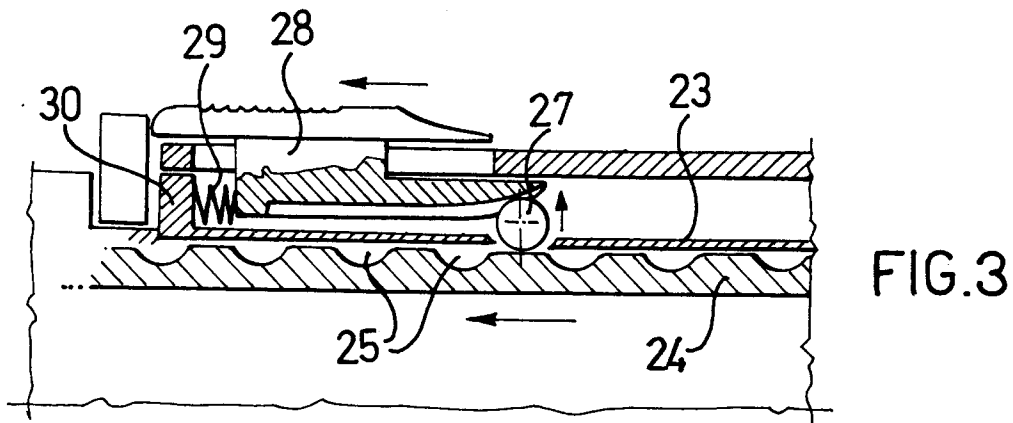
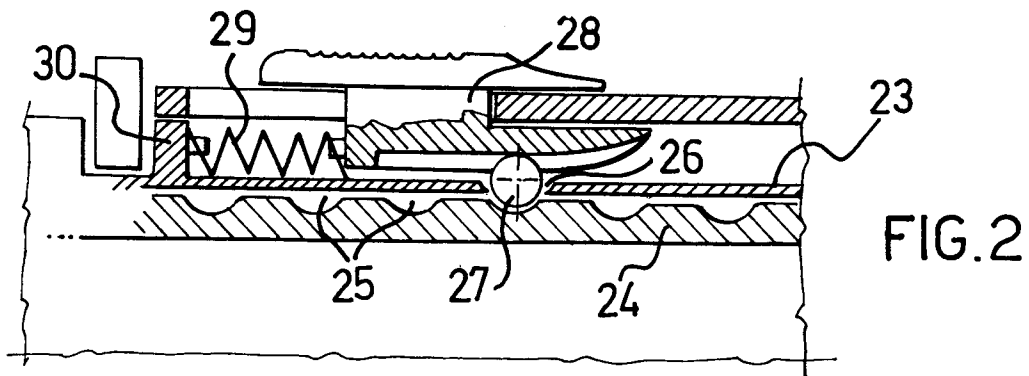
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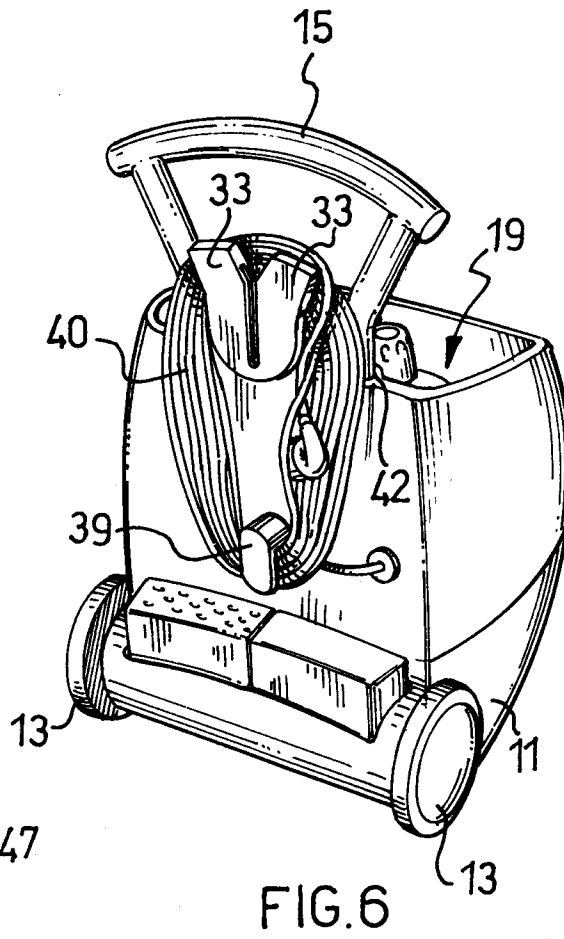
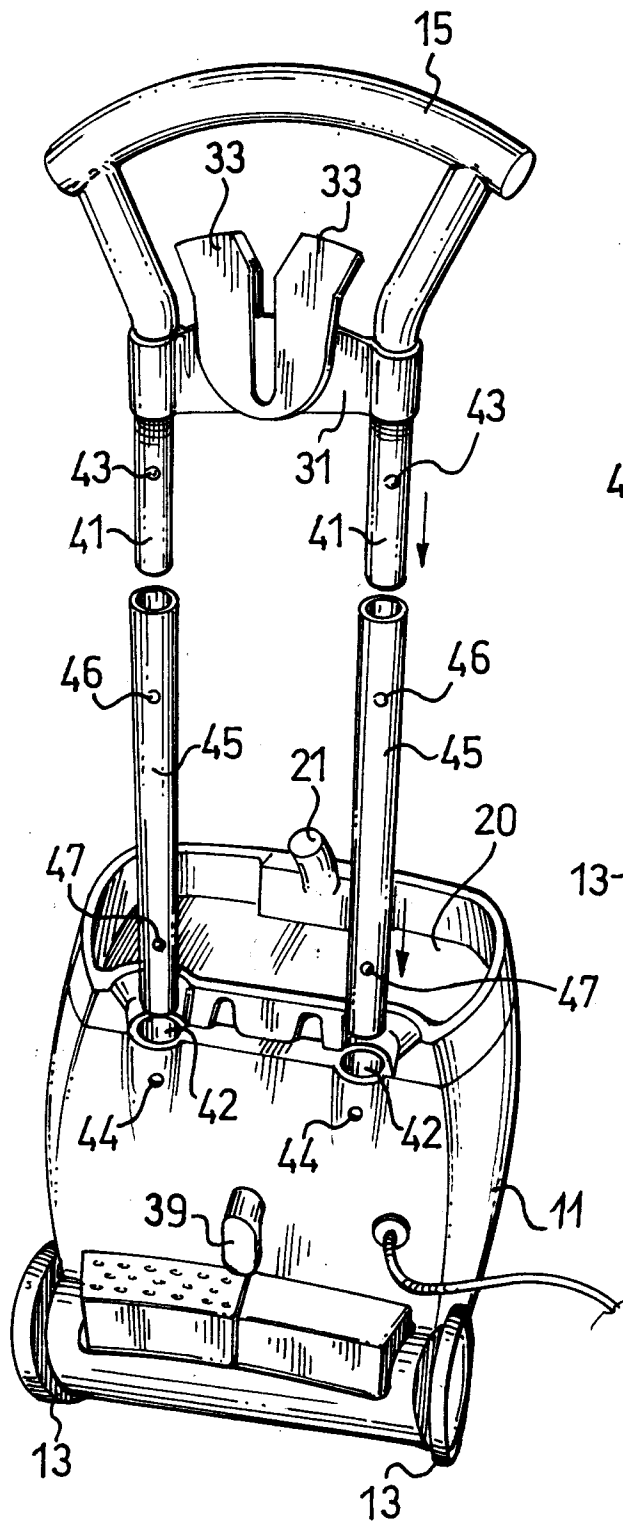
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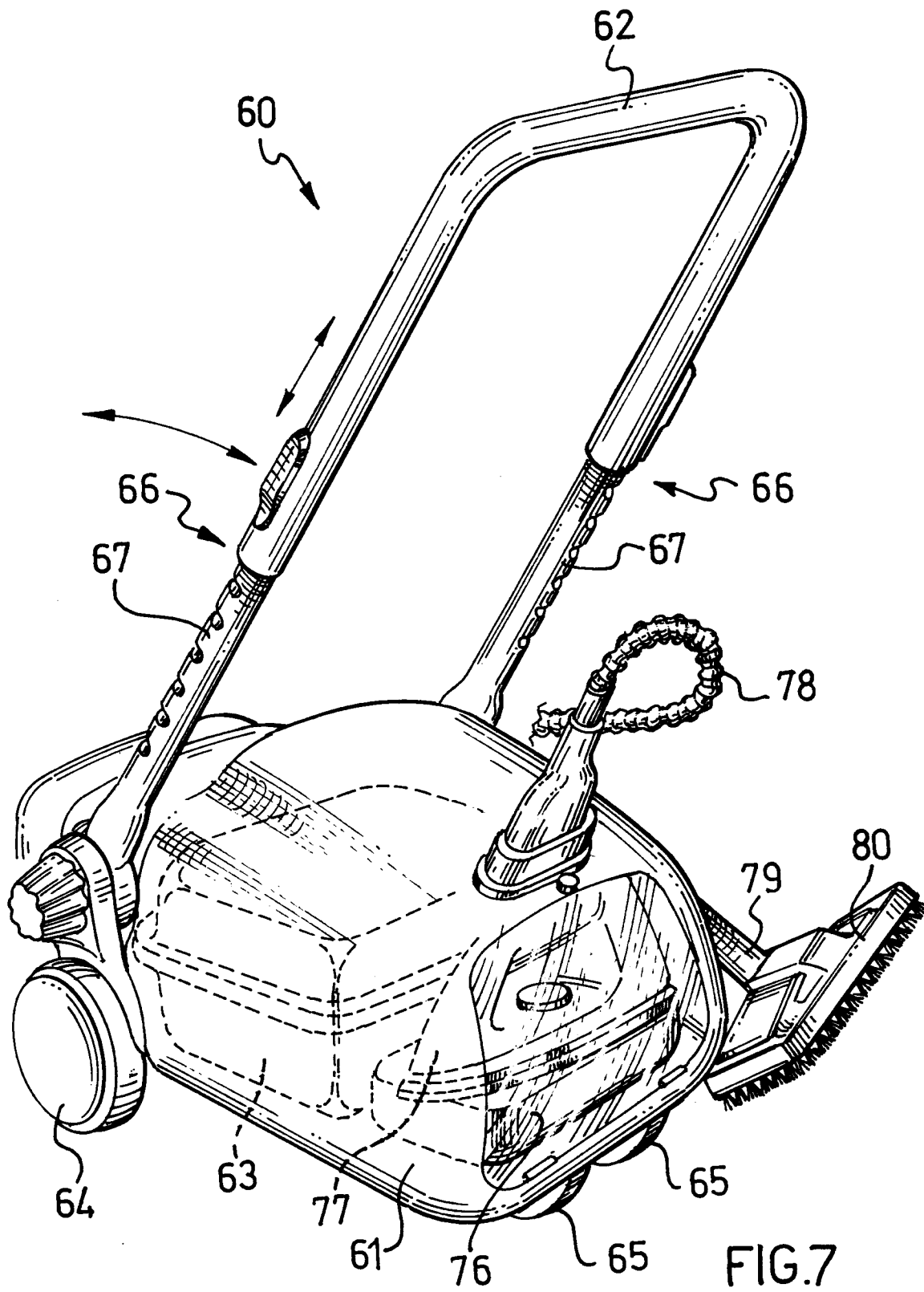
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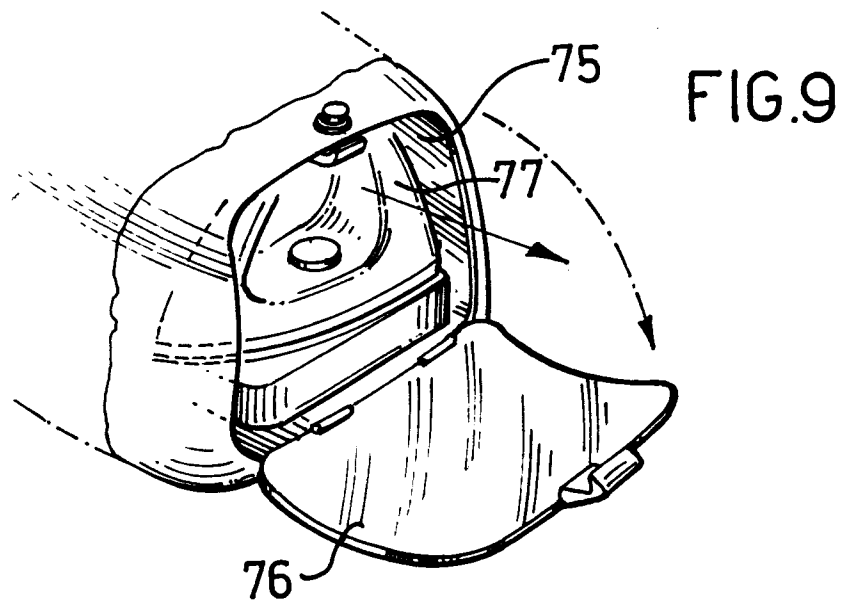
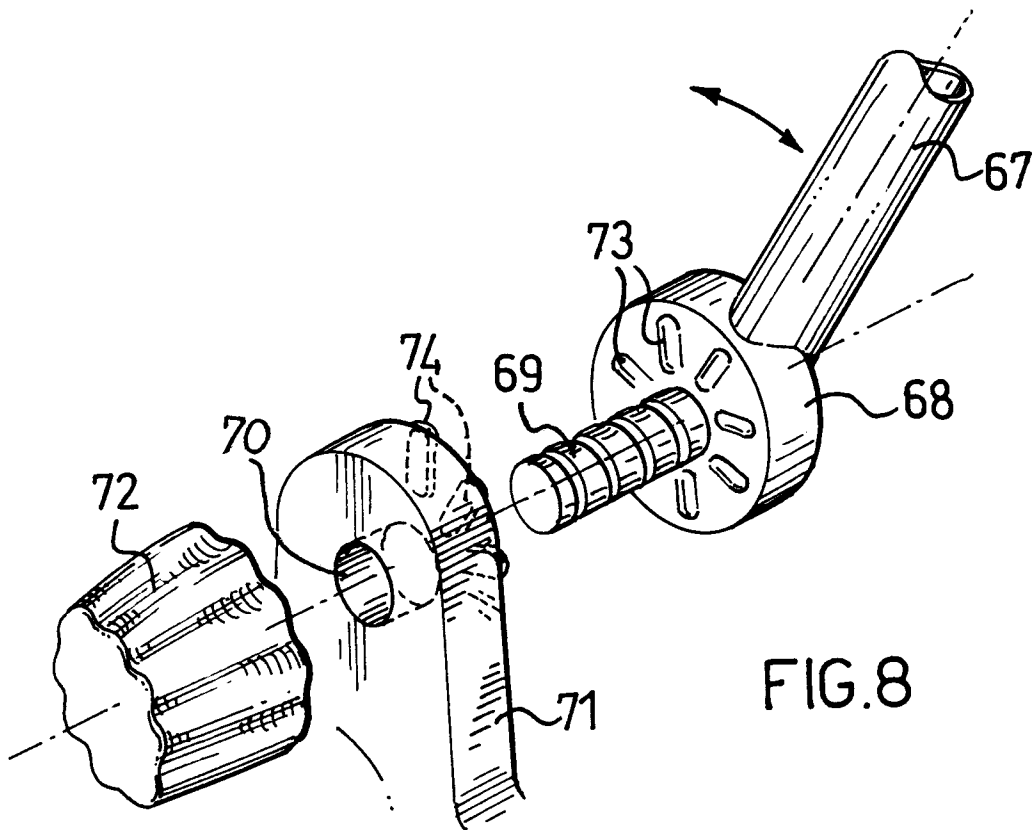
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EUROPEAN SEARCH REPORT

Application Number
EP 97 83 0726

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
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A	EP 0 286 203 A (BLACK & DECKER INC.) 12 October 1988		TECHNICAL FIELDS SEARCHED (Int.Cl.6) A47L D06F
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-The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 9 June 1998	Examiner BOURSEAU, A
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)



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Application Number
EP 97 83 0726

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- ☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- ☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1-10



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Office

**LACK OF UNITY OF INVENTION
SHEET B**

Application Number
EP 97 83 0726

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims: 1-10

Telescopic handle for a cleaning apparatus

2. Claims: 11-13

Container for storing accessories of a cleaning apparatus
and acting also as a lid for a compartment of the body of
said apparatus

3. Claims: 14, 15

Body for a steam cleaning apparatus comprising an internal
compartment for housing a steam iron connected to the steam
output pipe of said apparatus

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

EP 97 83 0726

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
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09-06-1998

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