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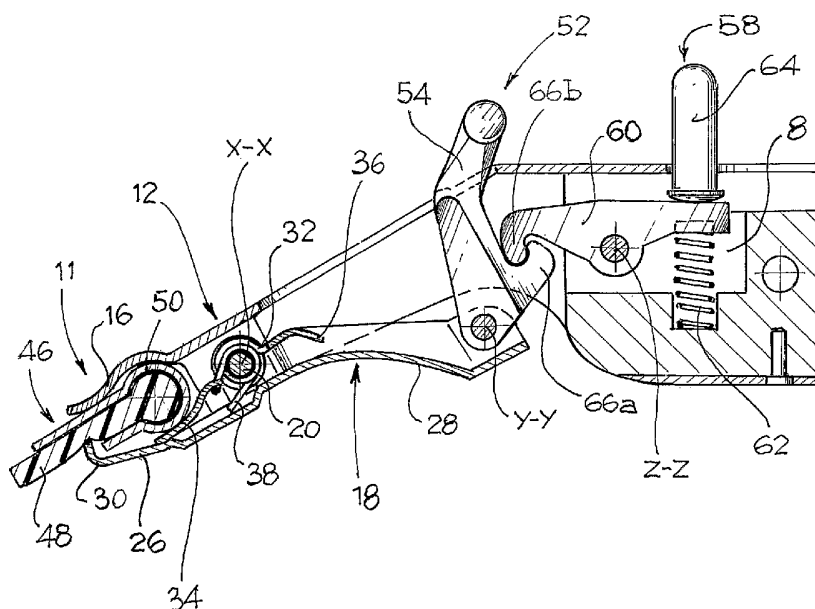
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(54) Title: SQUEEGEE FOR SURFACE CLEANING



(57) Abstract: A window squeegee (1) for cleaning surfaces, such as skyscraper windows, comprises a handle (2) associated to a head (11) provided with a first connection element (12) and a second connection element (18) for connecting a spatula (46) to the handle (2). In a condition of normal use of the window squeegee, the spatula (46) is held between the first element (12) and the second element (18) and in a condition of replacement of the spatula, the second element (18) is rotated by the first element (12) to allow the replacement of the spatula (46) which is held associated to the head (11) of the window squeegee and is not free to remove, to ensure a safe replacement.

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DESCRIPTION**"SQUEEGEE FOR SURFACE CLEANING"**

[0001]. The present invention relates to a window squeegee for cleaning surfaces, such as the glass surfaces of skyscrapers, the glasses of a window, typically during a surface cleaning operation, which is usually carried out in balance at considerable height.

[0002]. Generally, window squeegees are provided with a spatula provided with a cleaning blade that comes into contact with the surface and, pulled over it, allows the removal of the liquid - usually water and detergent - used for cleaning.

[0003]. Residues of dirt, such as dust, mud or the like, following the use of the window squeegee tend to accumulate on the cleaning blade, and during a subsequent cleaning operation, for example, a part of them could come off the blade and be spread onto the surface to be cleaned, soiling it further.

[0004]. It is therefore necessary to replace the spatula or the cleaning blade according to the needs.

[0005]. In special use conditions, such as when cleaning skyscraper windows or windows at a certain height, the cleaning operation is often carried out in unstable balance conditions for the user of the window squeegee, so there is the need of replacing the spatula

in a quick and safe manner.

[0006]. It is therefore necessary to replace the spatula in a safe and quick manner, ensuring at the same time that during normal use, the removable and
5 replaceable spatula is suitably held so as to allow an easy cleaning of the surface.

[0007]. The problem at the basis of the present invention is that of devising a window squeegee which should exhibit such structural and functional features as
10 to meet the above requirements while at the same time obviating the disadvantages mentioned with reference to known solutions.

[0008]. Such problem is solved by a window squeegee according to the following claims. The dependent claims
15 describe further variants of embodiments.

[0009]. Further features and advantages of the window squeegee according to the present invention will appear more clearly from the following description of a preferred and non-limiting example of embodiment,
20 wherein:

[0010]. - figure 1 shows a three-dimensional view of a window squeegee according to the present invention;

[0011]. - figure 2 shows the window squeegee of figure 1 according to a three-dimensional view with separate
25 parts;

[0012]. - figure 3 shows the window squeegee of figure 1 in a first condition of normal operation;

[0013]. - figure 4 shows the window squeegee of figure 1 in a second condition called of spatula replacement.

5 [0014]. With reference to the attached figures, reference numeral 1 globally indicates a window squeegee according to the invention.

[0015]. Said window squeegee is suitable for cleaning surfaces such as skyscraper windows, window glasses, shop
10 windows and even windscreens or back windows of motor vehicles, removing liquid from said surface, generally water mixed with detergent, typically during an operation for cleaning said surfaces.

[0016]. Squeegee 1 comprises a handle 2, generally
15 having an elongated shape according to a longitudinal direction, adapted for being gripped by a user to carry out the surface cleaning operation in plane or height.

[0017]. Said handle is a preferred example of
20 embodiment of gripping means, adapted for allowing the desired use of the tool.

[0018]. In a preferred articulated embodiment, handle 2 is connected to a bushing 4 provided with a projection 6 for the connection to said handle 2 and at a side opposed said projection, with a seat 8.

25 [0019]. Projection 6 is suitable for being housed into

a corresponding recess 10 of the handle, to which said bushing 4 is associated.

[0020]. Squeegee 1 is provided with a head 11, comprising a first connection element 12.

5 [0021]. In an embodiment, said head is connected to the gripping means, for example to handle 2.

[0022]. In a further embodiment, said head is connected to bushing 4.

[0023]. Preferably, said first connection element 12 is
10 provided with a projection 14 suitable for being housed into seat 8 of bushing 4 or of handle 2, preferably held by locking means comprising, for example, a thorough seat - pin system.

[0024]. In a preferred embodiment, the first connection
15 member 12 extends enlarging from said projection 14 in a transversal direction substantially perpendicular to said longitudinal direction of handle 2.

[0025]. At the end opposed said projection 14, the connection element 12 is provided with a flange 16,
20 preferably having an undulated shape according to said longitudinal direction.

[0026]. Head 11 also comprises a second connection element 18, hinged relative to an axis of rotation X-X to said first connection element 12 and adapted for rotating
25 and opening relative to it.

[0027]. For example, said second element 18 is hinged to said first element 12 by a pin 20 that engages a pair of holes 22a, 22b of said first element 12 and a pair of holes 24a, 24b of said second element 18, said holes
5 being coaxial to said rotation axis X-X.

[0028]. Said rotation axis X-X determines in said second element 18 a first portion 26 and a second portion 28 provided with a flap 30 at an end.

[0029]. Moreover, said head 11 comprises a third
10 connection element 32.

[0030]. In a preferred embodiment, the third connection element 32 is hinged along said rotation axis X-X.

[0031]. For example, said third connection element 32 is hinged to said first connection element 12 and to said
15 second connection element 18 by said pin 20.

[0032]. The rotation axis X-X determines on said third element 32 a first thrust portion 34, close to the end of the first element 12 provided with flange 16, and a second portion 36.

20 [0033]. Squeegee 1 also comprises elastic means 38, provided between said second element 18 and said third element 32, suitable for constantly affecting said third element and said second element.

[0034]. For example, said elastic means 38 comprises a
25 spring provided with a rectilinear portion 40, acting on

the thrust portion 34 of the third element 32, spiral portions 42a, 42b ending in side portions 44a, 44b acting on said second element 18.

[0035]. Said squeegee 1 also comprises a spatula 46
5 provided with a cleaning blade 48, typically made of rubber, synthetic rubber or plastic and preferably inserted in a spatula holder 50, generally made of a metal material.

[0036]. In a variant of embodiment, squeegee 1 is
10 provided with locking/release means 52, preferably manually actuable, suitable for locking and/or releasing spatula 46.

[0037]. In a variant of embodiment, said locking/release means 52 comprise a lever 54 hinged to
15 the second connection element 18 at a release axis Y-Y parallel and distinct from said rotation axis X-X of the second connection element 18.

[0038]. In an embodiment, lever 54 is provided with abutment shoulders 54a, 54b.

20 [0039]. In a variant of embodiment, said squeegee 1 is provided with said release lever 54 protruding from said first connection element 12 through an opening 56.

[0040]. Preferably, said squeegee 1 is provided with means for locking lever 54, preferably comprising
25 recesses arranged inside said first connection element

12, for example at the sides of said opening 56. Outside said first element 12, said recesses determine respective projections 57a, 57b.

[0041]. Preferably, said squeegee 1 also comprises safety means 58 adapted for preventing the operation of said locking/release means 52.

[0042]. According to an embodiment, said safety means 58 comprises a locking element 60 hinged at a safety axis Z-Z, for example passing through bushing 4 and parallel to said release axis Y-Y.

[0043]. Said locking element 60 is constantly affected by an elastic element 62. Moreover, a button 64 protruding for example from said bushing 4, abuts on said locking element, adapted for being pressed by a user so that the user's action opposes the action of said elastic element 62 on said locking element 60.

[0044]. In a variant of embodiment, said lever 54 of the locking/release means 52 and said button 64 of the safety means 58 are arranged so as to be actuated, the lever subsequently the button.

[0045]. According to a variant of embodiment, squeegee 1 is provided with a snap mechanism comprising a first hook element 66a protruding from lever 54 and a second hook element 66b, protruding from said locking element 60.

[0046]. Preferably, said first and said second hook element 66a, 66b are provided with facing surfaces provided with a contour suitable for allowing the relative sliding following the rotation of lever 54.

5 [0047]. In a condition of normal use of the window squeegee 1, spatula 46 is held between said first connection means 12 and said second connection means 18 (figure 3).

[0048]. In other words, in the condition of normal use,
10 lever 54 is in locking position wherein it is engaged with the locking element 60 of the safety means 58.

[0049]. Locking element 60 is affected by said elastic element 62 so as to remain engaged with said lever 54. Button 64 is in a locking position, for example raised.

15 [0050]. Moreover, in a variant of embodiment, shoulders 54a, 54b of lever 54 abut in the recesses of the first connection element 12, determining a position of the second connection element 18, to which said lever 54 is hinged, adapted for holding the spatula 56.

20 [0051]. The second connection element 18, hinged to the rotation axis X-X fixed relative to the first element 12, following the position of lever 54 and therefore of the release axis Y-Y, engages spatula 46 with flap 30, for example gripping the cleaning blade 48.

25 [0052]. At the same time, the second connection element

18, in the normal condition of use of the window squeegee, increases the tension of the elastic means 38 that affect the third connection element 32.

[0053]. In other words, the third element 32, through its thrust portion 34, affects spatula 46, abutting it against the first connection element 12, for example pushing the blade holder 50 against flange 16 of the first connection element 12.

[0054]. Actuating button 64, the locking element 60 disengages from lever 54. Moving lever 54 from the locking position, the second connection element moves away, at least by a portion, from the first connection element 12 (figure 4).

[0055]. Preferably, from the locking condition to the condition of replacement of the spatula, lever 54 disengages from the first element 12 moving the ends of shoulders 54a, 54b of said lever 54 outside the recesses of the first connection element 12.

[0056]. Flap 30 of the second element 18, that rotates around the rotation axis X-X following the rotation of lever 54 around the release axis Y-Y and following the disengagement from the first connection element 12, moves away from the first connection element 12.

[0057]. At the same time, the elastic means 38 are released and the third connection element 32 relieves but

does not cancel its influence on spatula 46, to allow its safe and convenient replacement.

[0058]. In other words, the window squeegee 1 is provided with first safety means that in an embodiment
5 comprise said third element 32, adapted for holding spatula 46 associated to head 11 also during the spatula replacement, allowing at the same time the removal of said spatula from head 11 by the user.

[0059]. In other words, the window squeegee 1 is
10 provided with first safety means adapted for holding spatula 46 associated to head 11 during the spatula replacement, being provided with a pushing element, such as the third element 32, that in said condition abuts the spatula against the first element 12.

15 [0060]. After the replacement, lever 54 is returned to the locking position to hold spatula 46.

[0061]. The snap mechanism allows - by rotating lever 54 only - the relative sliding of the facing surfaces of the first and second hook element 66a, 66b up to move the
20 locking element 60 in engagement with lever 54.

[0062]. Unusually, the squeegee according to the present invention allows replacing the spatula in a safe manner, ensuring at the same time that during normal use, said spatula can be suitably gripped so as to allow
25 cleaning the surface.

[0063]. Innovatively, the window squeegee according to the invention prevents the removal of the blade holder and its hazardous fall during cleaning operations at a certain height, even while replacing the spatula, that is, when the second element is opened relative to the first one.

[0064]. Advantageously, in said condition of replacement, the spatula is not removed from the window squeegee head, even though said head is wet with water or water and detergent.

[0065]. Moreover, advantageously, in the condition of normal use the spatula is held both by a flap of the second connection element that grips the cleaning blade, and by cooperation of the third connection element that abuts the spatula against its flange 16.

[0066]. According to a further advantageous aspect, the window squeegee according to the invention can house a plurality of spatulas. In other words, the window squeegee according to the invention can house any blade holder regardless of the section profile, thereby allowing the user to use the blades he prefers.

[0067]. According to a further aspect, such user-preferred blades can be used safely during replacement.

[0068]. According to a further advantageous aspect, the spatula can be replaced following the actuation of the

safety means and afterwards of the locking/release means, said locking/release means being actuated while said safety means remain in the disengaged condition.

[0069]. According to a further advantageous aspect, the safety means button and the locking/release means lever are arranged in successive positions, suitable for being actuated by a user in a sequence, the lever subsequently the button.

[0070]. In other words, pressing the button, rotating the lever to the release position and keeping the button in pressed position are convenient operations since the positions of button and lever allow the user to grip the handle and actuate button and lever simply by his thumb.

[0071]. Finally, the window squeegee according to the invention requires no difficult and repeated maintenance to keep the mechanism that enables the rotation of the second connection element relative to the first one clean, that is free from dirt, mud and the like.

[0072]. In other words, since there are no mechanisms, for example with screws, the window squeegee according to the invention can be used for a longer time without requiring maintenance.

[0073]. A man skilled in the art will be able to make changes to the squeegee according to the present invention.

[0074]. For example, in a variant of embodiment said gripping means comprise a telescopic extension or an arm of a cleaning machine.

[0075]. In a further variant of embodiment, said safety
5 means are provided with a lever actuatable device. In a further variant, they are provided with a ratchet gear.

[0076]. It is clear that also these variants are to be regarded as falling within the scope of protection as defined in the following claims.

CLAIMS

1. Window squeegee (1) for cleaning a surface, such as a skyscraper window, a window glass and the like, said squeegee being provided with a head (11) provided
5 with a first connection element (12) and a second connection element (18) for connecting a spatula (46) to gripping means (2);

said spatula (46), in a condition of normal use of the squeegee, being held between the first element (12)
10 and the second element (18), said spatula being adapted in said normal condition of use for removing liquid from said surface;

wherein, in a condition of said squeegee suitable for replacing the spatula, the second element (18) is at
15 least partly moved away from the first connection element (12) to allow the replacement of the spatula (46).

2. Squeegee (1) according to claim 1, further comprising first safety means adapted for holding said spatula (46) associated to said head (1) in said
20 replacement condition.

3. Squeegee (1) according to any one of the previous claims, further comprising a third connection element (32) adapted for constantly abutting said spatula (46) against said first element (12) or said second element
25 (18).

4. Squeegee (1) according to any one of the previous claims, wherein in the condition of the squeegee suitable for replacing the spatula, a third connection element (32) constantly abuts said spatula (46) against said first element (12) or said second element (18).

5. Squeegee (1) according to claim 3 or 4, wherein said third element (32) is hinged at a rotation axis (X-X) fixed relative to said first element (12).

6. Squeegee (1) according to any one of claims from 3 to 5, wherein said third element (32) is affected by elastic means (38) arranged between said second element (18) and said third element (32) to hold the spatula (46).

7. Squeegee (1) according to any one of the previous claims, wherein said spatula (46) in the condition of normal use is hold between said first element (12) and by a third element (32) arranged between said first and said second element (12,18).

8. Squeegee (1) according to claim 7, wherein said third element (32) affects a blade holder (50) of said spatula (46).

9. Squeegee (1) according to any one of the previous claims, wherein said second element (18) at a free end is provided with a flap (30) adapted for engaging said spatula (46).

10. Squeegee (1) according to claim 9, wherein said flap grips a cleaning blade (48) of said spatula (46).

11. Squeegee according to any one of the previous claims, wherein said second connection element (18) is
5 hinged to said first connection element at a rotation axis (X-X) to rotate around said axis from the condition of normal use to the condition of replacement of the spatula.

12. Squeegee (1) according to any one of the
10 previous claims, further comprising locking/release means adapted for locking said spatula for using it.

13. Squeegee (1) according to claim 11, wherein said locking/release means comprise a lever (54) hinged to a
15 release axis (Y-Y) parallel and distinct from a rotation axis (X-X) of said second element (18).

14. Squeegee (1) according to claim 13, wherein said lever (54) comprises shoulders (54a, 54b) adapted for
pushing in the condition of normal use said second element (54).

20 15. Squeegee (1) according to any one of claims from 12 to 14, further comprising safety means adapted for preventing the actuation of said locking/release means.

16. Squeegee (1) according to claim 15, wherein said safety means comprise a locking element (60) hinged at a
25 safety axis (Z-Z).

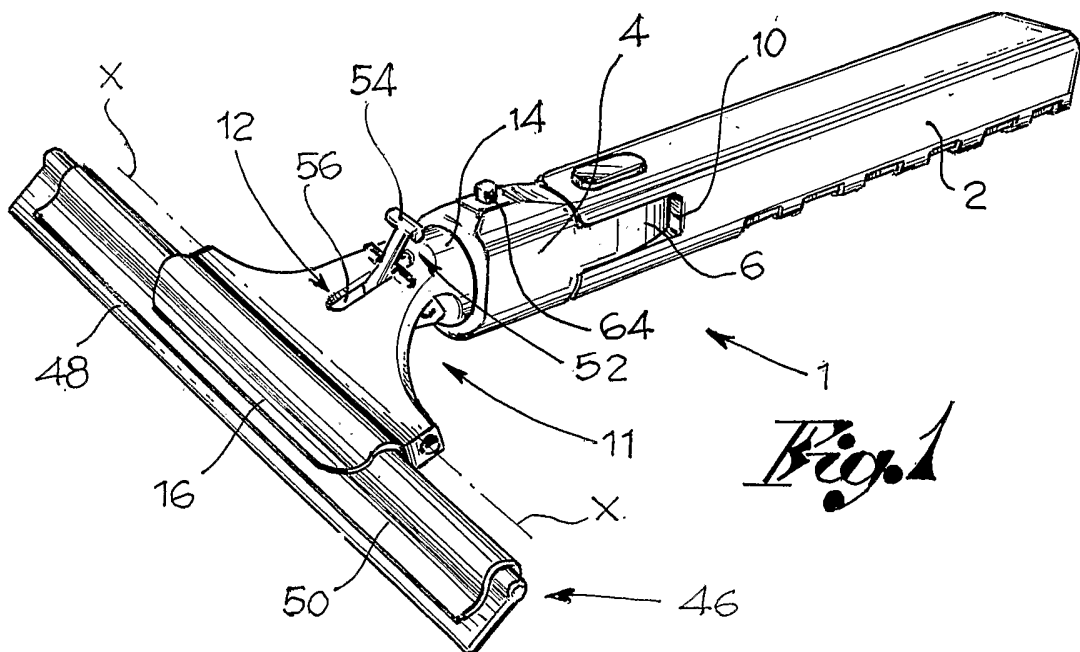
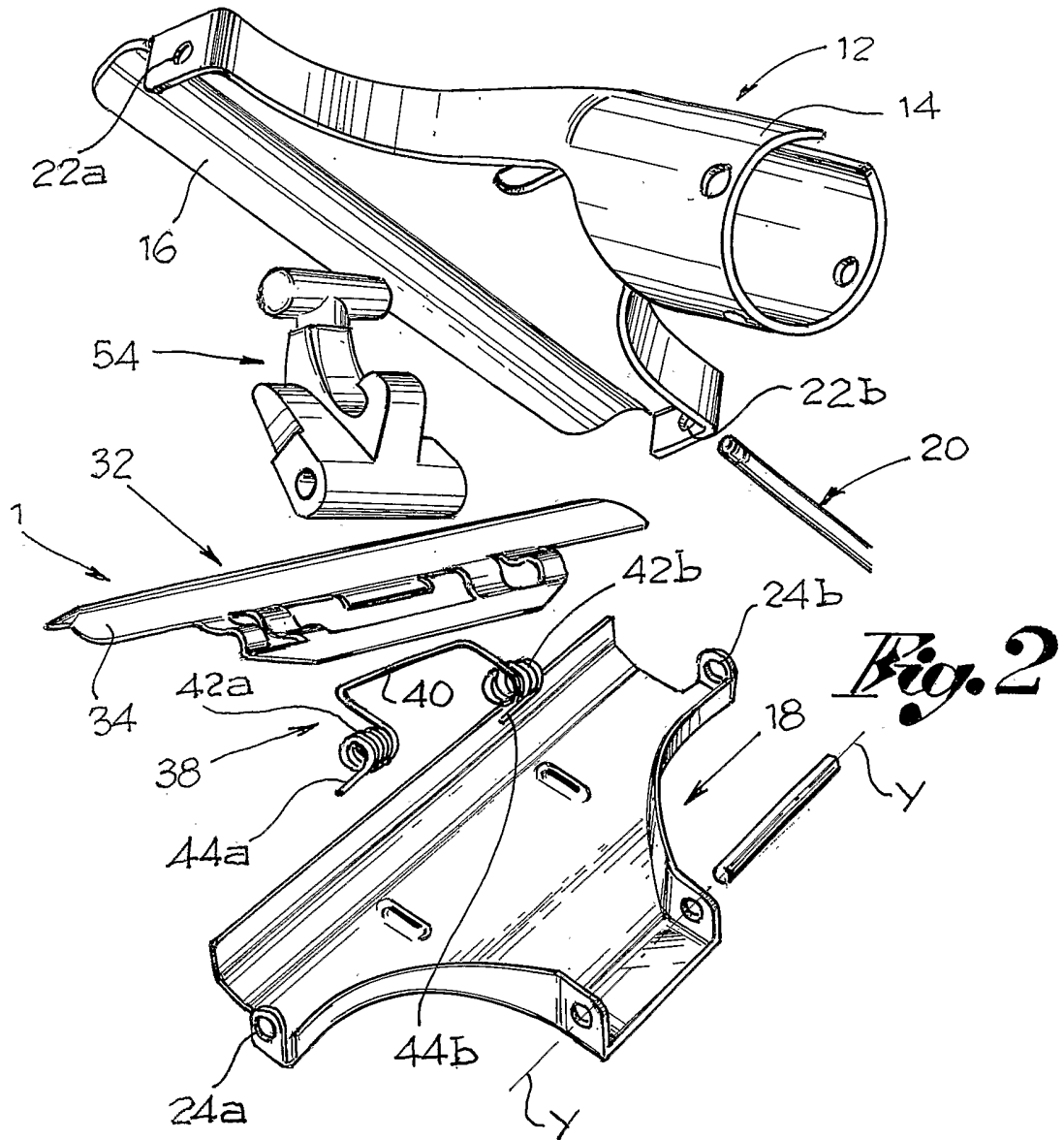
17. Squeegee (1) according to claim 15 or 16, wherein said safety means further comprise a button (64) and an elastic element (62).

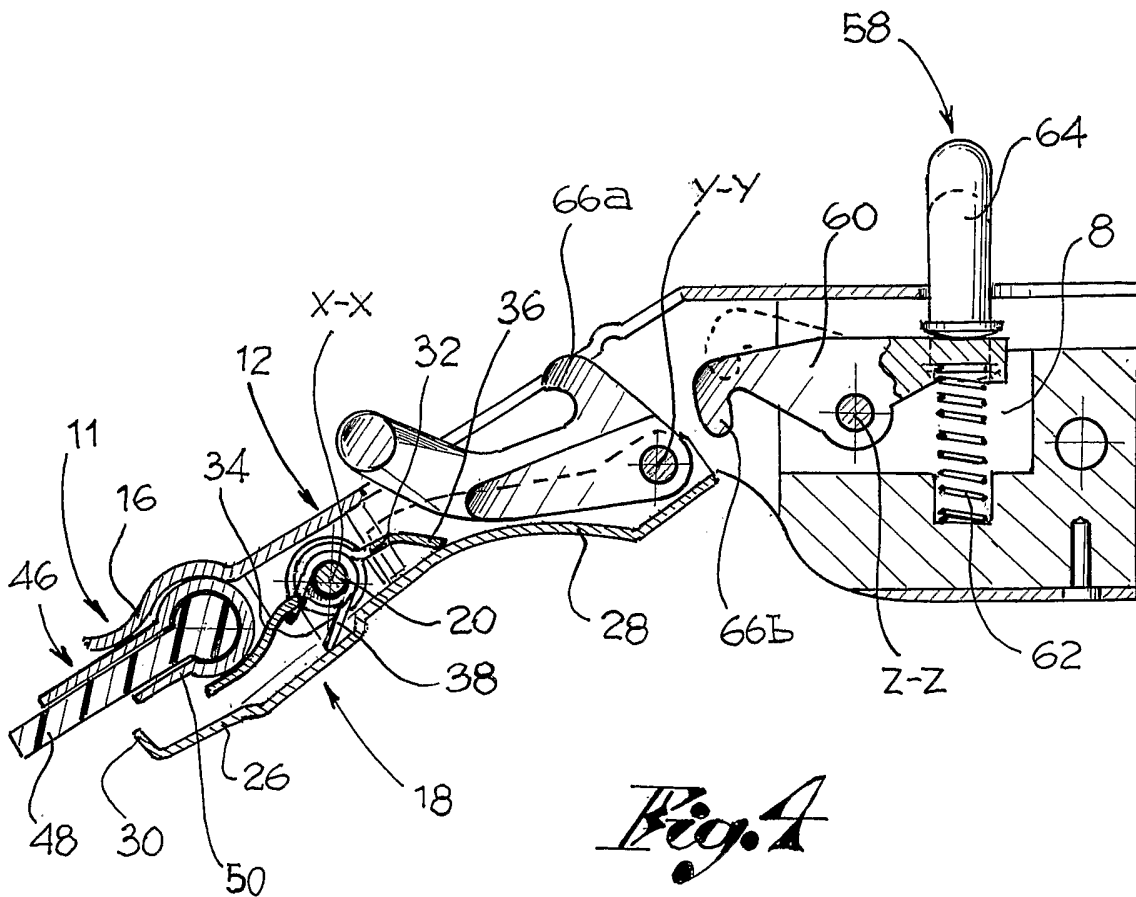
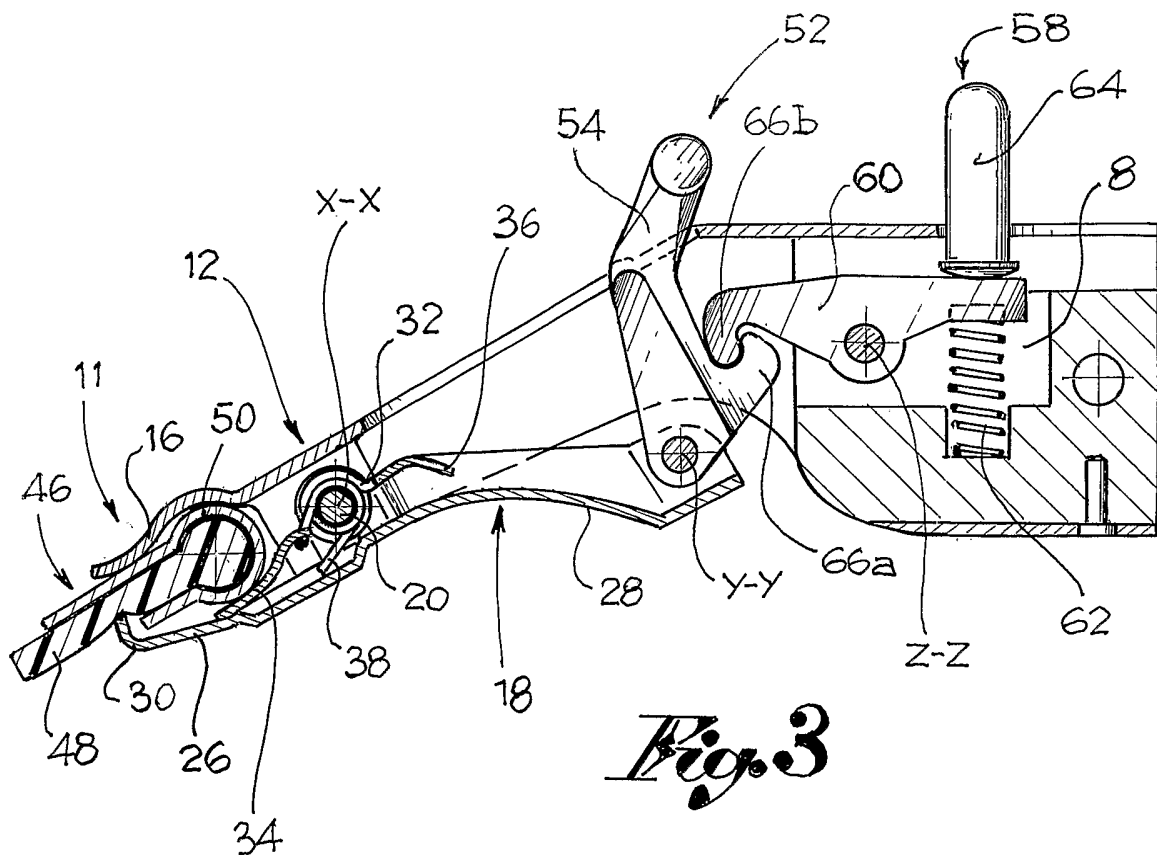
18. Squeegee (1) according to claim 1, comprising
5 locking/release means (52) of said second element (18) and safety means (58) adapted for preventing the actuation of said locking means for the release of the spatula (46).

19. Squeegee (1) according to claim 18, wherein said
10 safety means and said locking/release means are adapted for being actuated at the same time by a user.

20. Squeegee (1) according to claim 19, wherein said safety means and said locking/release means are adapted for being actuated at the same time by a user using just
15 one finger.

21. Squeegee (1) according to any one of claims from 18 to 20, wherein said safety means comprise a button (64) and said locking/release means comprise a lever (54).





INTERNATIONAL SEARCH REPORT

International Application No PCT/IT 03/00541
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A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 A47L1/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
 IPC 7 A47L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
 EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATENT ABSTRACTS OF JAPAN vol. 1997, no. 10, 31 October 1997 (1997-10-31) -& JP 09 154776 A (NIPPON WAIPABUREEDE KK), 17 June 1997 (1997-06-17) abstract; figures 1-3	1, 11
A	---	2-10
X	US 5 930 863 A (S. SAMUELSON) 3 August 1999 (1999-08-03) column 2, line 62 -column 4, line 54 column 5, line 14 -column 6, line 29 figures	1
A	---	2-11
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<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C.	<input checked="" type="checkbox"/> Patent family members are listed in annex.
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* Special categories of cited documents:

<p>*A* document defining the general state of the art which is not considered to be of particular relevance</p> <p>*E* earlier document but published on or after the international filing date</p> <p>*L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>*O* document referring to an oral disclosure, use, exhibition or other means</p> <p>*P* document published prior to the international filing date but later than the priority date claimed</p>	<p>*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>*&* document member of the same patent family</p>
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Date of the actual completion of the international search 17 May 2004	Date of mailing of the international search report 03/06/2004
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Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer Bourseau, A-M
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INTERNATIONAL SEARCH REPORT

International Application No

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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