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

(11) **EP 4 039 163 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
10.08.2022 Bulletin 2022/32

(21) Application number: **21155895.2**

(22) Date of filing: **09.02.2021**

(51) International Patent Classification (IPC):
A47L 13/11 *(2006.01)* ***A47L 13/12*** *(2006.01)*
A47L 13/16 *(2006.01)* ***A47L 13/255*** *(2006.01)*
A47L 13/256 *(2006.01)*

(52) Cooperative Patent Classification (CPC):
A47L 13/12; A47L 13/11; A47L 13/16; A47L 13/255; A47L 13/256

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

(71) Applicant: **Reax Innovations Oy**
02920 Espoo (FI)

(72) Inventors:
- **TUOMIVIRTA, Janne**
  02710 Espoo (FI)
- **TUOMIVIRTA, Reima**
  00940 Helsinki (FI)

(74) Representative: **Berggren Oy**
P.O. Box 16
Eteläinen Rautatiekatu 10A
00101 Helsinki (FI)

(54) MULTI-FUNCTION CLEANING TOOL

(57) The invention relates to a multi-function cleaning tool, which cleaning tool (10) comprises a frame part (11), which frame part (11) is longitudinal and substantially rectangular in shape, which cleaning tool (10) comprises a mounting part (16) for a handle arm, and engagement elements (20) for a cleaning cloth. The frame part (11) further comprises on one longitudinally extending side bristles (17) and on other longitudinally extending side a squeegee (12). The frame part (11) comprises a head surface (19) to which the mounting part (16) is attached by a turning joint (15) and to which the engagement elements (20) are attached, and the turning joint (15) for the mounting part (16) is located in middle part of the head surface (19) of the frame part (11) and configured to provide a turning movement (R) of the frame part (11) around its center such that depending on need of cleaning either the longitudinal side of the bristles (17) is locatable against a floor or corresponding surface to be cleaned or the longitudinal side of the squeegee (12) is locatable against the floor or corresponding surface to be cleaned.

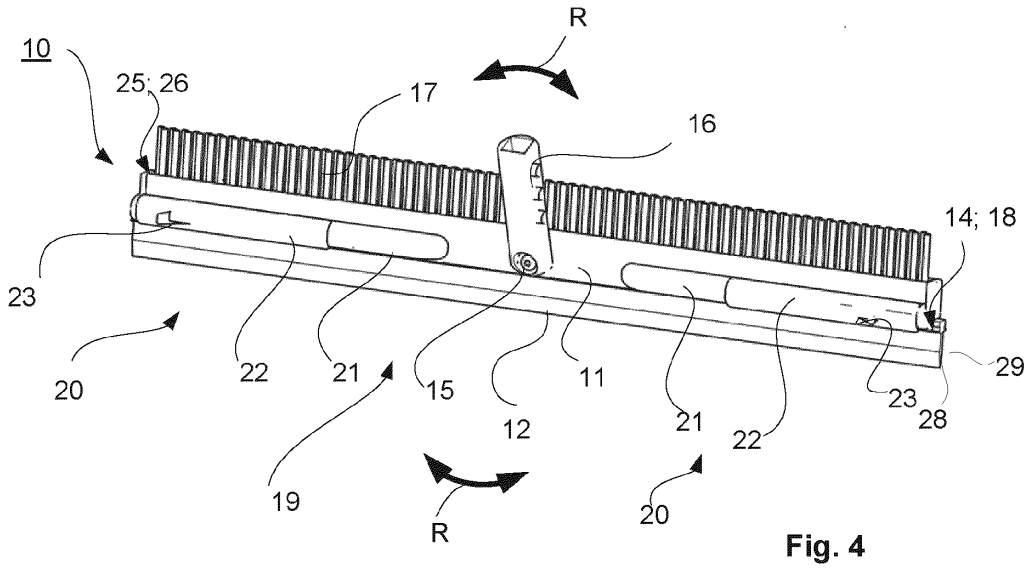

Fig. 4

EP 4 039 163 A1

Description

Technical field

[0001] The present invention relates to hand-held multi-function cleaning tools. More precisely the present invention relates to a multi-function cleaning tool according to the preamble part of claim 1.

Background

[0002] From prior art is known different types of multi-function, hand-held cleaning tools, with or without a cleaning cloth releasably attached, for different kinds of cleaning for cleaning floors and surfaces. Many multi-function cleaning tools allow for mopping, brushing or squeegeeing, but they are often complicated in structure and typically unpractical and inconvenient in use, especially in regards of changing from one cleaning function to another. Thus, there exists a need for a new and improved hand-held multi-function cleaning tool which provides. Additionally, typically the need for quick and reliable attachment and release of the cleaning cloths is very important.

[0003] In patent application publication EP 3207851 A1 is disclosed the mop head comprising a plurality of bristles on a first side of the mop head, and a fabric attachment portion on a second, opposite face of the mop head. The mop head may also comprise a squeegee on the second side of the mop head. The mop head further comprises an attachment portion comprising a variable angle connector and a locking mechanism and located substantially towards a center of a top surface of the mop head. The mop head further comprises a restraining mechanism configured to restrain the variable angle connector relative to the mop head or a configuration locking mechanism releasably locking the mop head in a specific configuration, e.g. a bristles down or squeegee down configuration. The mop head is configured to be removably attachable to the handle via the attachment portion.

[0004] In utility model registration FI 11050 U is disclosed a cleaning tool, with an elongated arm and a frame, to which cleaning parts, for example bristle, or a squeegee is attached. Lower part of the arm is formed as a fork-like configuration and the frame is attached to the arm in between the forks of the lower part of the arm rotatably in perpendicular direction in respect of longitudinal direction of the arm such, that the frame is rotatable around its axis between the forks.

[0005] In patent application publication EP 3569132 A1 of the applicant is disclosed a head part for a hand-held cleaning tool comprising an elongated body and attachment means for attaching a cleaning cloth to the head part, the attachment means comprising a first engagement element for engagement with a first engagement point of a cleaning cloth, and a second engagement element for engagement with a second engagement point of the cleaning cloth, wherein at least the first engagement element is movable in the longitudinal direction of the body between a first position, which is at a first distance from the second engagement element, and a second position, which is at a second distance from the second engagement element, the second distance being shorter than the first distance, and the head part further comprising a spring device, which is arranged to resist movement of the first engagement element from the first position towards the second position. the head part has a first side, which is configured to face a surface to be cleaned, and a second side facing an opposite direction relative to the first side, and the first engagement element and the second engagement element are arranged on the second side of the head part.

[0006] One objective is to create an improved hand-held, multi-function cleaning tool, in which the above described disadvantages relating to known multi-function cleaning tools, especially in view of complicated structure, are eliminated or at least minimized.

[0007] One objective of the present invention is to provide a multi-function cleaning tool with combination of cleaning functions, and in which cleaning functions changeable from one to another in practical and convenient manner.

[0008] One objective of the present invention is to provide a multi-function cleaning tool in which quick and reliable attachment and release of the cleaning cloth is provided.

Summary

[0009] In order to achieve the above objects and those that will come apparent later the multi-function cleaning tool is mainly characterized by the features of the characterizing part of claim 1.

[0010] Dependent claims present advantageous features and embodiments of the invention.

[0011] According to the invention the multi-function cleaning tool comprises a frame part, which frame part is longitudinal and substantially rectangular in shape, which cleaning tool comprises a mounting part for a handle arm, and engagement elements for a cleaning cloth, wherein the frame part further comprises on one longitudinally extending side bristles and on other longitudinally extending side a squeegee, the frame part comprises a head surface to which the mounting part is attached by a turning joint and to which the engagement elements are attached, and the turning joint for the mounting part is located in middle part of the head surface of the frame part and configured to provide a turning movement of the frame part around its center such that depending on need of cleaning either the longitudinal side of the bristles is locatable against a floor or corresponding surface to be cleaned or the longitudinal side of the squeegee is locatable against the floor or corresponding surface to be cleaned.

[0012] According to an advantageous feature of the invention the frame part has a propeller-like movement

around its center and the turning joint.

[0013] According to an advantageous feature of the invention the bristles and/or the squeegee are releasably attached to the frame part.

[0014] According to an advantageous feature of the invention the bristles comprise a support part and the bristles are attached to a support part, which is attached to the frame part releasably.

[0015] According to an advantageous feature of the invention the squeegee comprises an attachment part and the frame part comprises an attachment groove and the attachment part of the squeegee is releasably located in the attachment groove of the frame part.

[0016] According to an advantageous feature of the invention the attachment part and the attachment groove have from fitting forms providing the releasable attachment of the squeegee to the frame part.

[0017] According to an advantageous feature of the invention the attachment groove has retaining protrusions at each outer edge of the attachment groove for retaining the attachment part of the squeegee in the attachment groove of the frame part.

[0018] According to an advantageous feature of the invention the mounting part is located on the head surface of the frame part in an inclined position such that an angle less than 90 decrees, advantageously less than 45 degrees, more advantageously 25 - 35 decrees, is formed between imaginary center axis of the mounting part and the head surface the frame part.

[0019] According to an advantageous feature of the invention the engagement part comprises a longitudinal guide located on the frame part and a slide configured to slide on the longitudinal guide in a sliding direction from first position to a second position towards center part of the frame part.

[0020] According to an advantageous feature of the invention the engagement part comprises an engagement element for the cleaning cloth located on the slide, to which engagement element an engagement hole of the cleaning cloth to is be located for attachment of the cleaning cloth to the frame part of the cleaning tool.

[0021] According to an advantageous feature of the invention the squeegee has a pointed cleaning edge for sharp line-shaped contact to the floor or corresponding surface to be cleaned.

[0022] According to an advantageous feature of the invention the squeegee has outwards angled extensions of the squeegee.

[0023] According to an advantageous feature of the invention opposite surface to the head surface of the frame part of the cleaning tool is planar.

[0024] According to an advantageous feature of the invention the mounting part has advantageously fastening means for fastening the handle arm releasably to the mounting part.

[0025] The multi-function cleaning tool according to the invention provides for many cleaning functions: by the bristles floors and like surfaces can be brushed and/or washed, by the squeegee floors and like surfaces can be dried, to the attachment elements different types of cleaning cloths can be attached for various cleaning functions, for example a mop for mopping, a wiping cloth for wiping, further the cleaning cloth can be attached onto the side of the bristles or onto the side of the squeegee, which provides for different effects for different cleaning needs and/or purposes.

[0026] By the multi-function cleaning tool according to the invention and its advantageous features many advantages are achieved: the structure of the multi-function cleaning tool is simple and thus, it is easy and cost-efficient to manufacture, as well as reliable in use due to the simple structure. The cleaning functions of the multi-function cleaning tool are easily, practically and in convenient manner changeable from one to another. Additionally, quick and reliable attachment and release of the cleaning cloth is provided.

Brief description of the drawings

[0027] In the following the invention and its advantages are explained in greater detail below in the sense of example and with reference to accompanying drawing, where

In figures 1A-1B is schematically shown an advantageous an example of a multi-function cleaning tool according to the invention, in figure 1A as a front view of a frame part of the cleaning tool and in figure 1B as a back view of the frame part of the cleaning tool,

In figures 2A-2B is schematically shown the advantageous example of figures 1A-1B, in figure 2A bristles of the cleaning tool towards viewer and in figure 2B a squeegee towards viewer,

In figures 3A-3B is schematically shown the advantageous example of figures 1A-2B, in figure 3A seen from one end of the frame part and in figure 3B seen from other end of the frame part, and

In figure 4 is schematically shown the advantageous example of figures 1A-3B as a 3D view.

Detailed description

[0028] During the course of the following description like numbers and signs will be used to identify like elements according to the different views which illustrate the invention and its advantageous examples. In the figures some repetitive reference signs may have been omitted for clarity reasons.

[0029] In the figures 1A-4 is shown an example of a multi-function cleaning tool 10 (in the following "cleaning tool"), which cleaning tool 10 comprises a frame part 11. The frame part 11 is longitudinal and substantially rec-

tangular in shape. The frame part 11 comprises on one longitudinally extending side bristles 17 and on other longitudinally extending side a squeegee 12. Both the bristles 17 and the squeegee 12 are releasably attached to the frame part 11 thus providing easy change for different types of the bristles 17 or the squeegee 12 for example due to wear or due to different type of cleaning need.

[0030] The frame part 11 comprises a head surface 19 to which a mounting part 16 is attached by a turning joint 15 and engagement elements 20 are attached.

[0031] In middle part of the head surface 19 of the frame part 11 the turning joint 15 for the mounting part 16 is located. Thus, the mounting part 16 for a handle arm (not shown) is mounted turnably by the turning joint 15 to the frame part 11. The turning joint 15 is configured to provide a turning movement R of the frame part 11 around its center by turning the frame par 11 around the turning joint 15 such that depending on need of cleaning either the longitudinal side of the bristles 17 is locatable against a floor or corresponding surface to be cleaned or the longitudinal side of the squeegee 12 is locatable against the floor or corresponding surface to be cleaned. Thus, the frame part 11 has a propeller-like movement R around its center.

[0032] The mounting part 16 is located on head surface 19 of the frame part 11 in an inclined position such that an angle A less than 90 degrees, advantageously less than 45 degrees, more advantageously 25 - 35 decrees, is formed between imaginary center axis of the mounting part 16 and the head surface 19 the frame part 11. Thus, the mounting part 16 is in inclined position in view of the surface level of the head surface 19 and thus, the mounting part 16 and the handle arm extend in inclined direction, not in perpendicular direction, from surface level of the head surface 19. The inclined positioning of the mounting part 16 provides for an advantageous positioning of the bristles 17 or the squeegee 12 against the floor or the corresponding surface to be cleaned in respect of ergonomics and of cleaning result.

[0033] The bristles 17 are attached to a support part 26, which in turn is attached to the frame part 11 releasably. Advantageously, the frame part 11 comprises a groove 27 or like for attachment of the support part 26.

[0034] The squeegee 12 is releasably attached to the frame part 11 by an attachment part 14 of the squeegee 12 located in an attachment groove 18 of the frame part 11. Advantageously, the attachment part 14 and the attachment groove 18 have from fitting forms, for example a dovetail fitting providing a releasable but reliable attachment of the squeegee 12 to the frame part 11. Advantageously, the attachment groove 18 has retaining protrusions 24, 25 at each outer edge of the attachment groove 18 for retaining the attachment part 14 of the squeegee 12 in the attachment groove. The attachment part 14 of the squeegee 12 is pressed into the attachment groove 18 to be located in the attachment groove 18. The squeegee 12 od released by pulling the attachment part 14 from the attachment groove 18 in longitudinal direction via one end of the attachment groove 18.

[0035] The frame part 11 also comprises on the head surface 19 of the frame part 11 two engagement parts 20 for attaching a cleaning cloth (not shown) to the frame part 11 of the cleaning tool 10. Each engagement part 20 comprises a longitudinal guide 21 located on the frame part 11 and a slide 22 configured to slide on the longitudinal guide 21 in a sliding direction S from first position to a second position towards center part of the frame part 11. The engagement part 20 also comprises an engagement element 23 for the cleaning cloth located on the slide 22. Advantageously, the movement of the slide 22 on the guide 21 from the first position to the second position in the sliding direction S is resisted by spring (not shown) and thus, movements of the engagement elements 23 from the second position to first position is spring assisted. Engagement holes of the cleaning cloth are to be located to the engagement elements 23 for attachment of the cleaning cloth to the frame part 11 of the cleaning tool 10. When the cleaning cloth is to be attached to the frame part the slide parts 22 of the engagement elements 20 are pressed towards each other providing a shorter distance in between of them and the spring resisting the movement. The engagement holes of the cleaning cloth are located on the engagement elements 23, when the engagement elements 23 are in the second position. As the cleaning cloth is in its place the engagement elements 23 are moved back to the first position and thus, the cleaning cloth tightens and is securely attached to the frame part 11 of the cleaning tool 10. The cleaning cloth can be located for cleaning with the side of the bristles 17 or the side of the squeegee 12 pressing the cleaning cloth against the floor or the corresponding surface to be cleaned.

[0036] Preferably, the engagement parts 20 correspond functionally to those described in the EP patent application 3569132 A1 of the applicant. The engagement parts 20 also advantageously correspond structurally to those described in the EP patent application 3569132 A1 of the applicant but are advantageously located on the top surface 19 of the frame part 11 instead of in grooves of the frame part 11.

[0037] The bristles 17 of the cleaning tool 10 can be of various types, known as such to one skilled in the art. The bristles 17 can thus be selected in view of the cleaning need.

[0038] The squeegee 12 of the cleaning tool 10 can be of various types, known as such to one skilled in the art. The squeegee 12 can thus be selected in view of the cleaning need. Advantageously, the squeegee 12 has a pointed cleaning edge for sharp line-shaped contact to the floor or corresponding surface to be cleaned. Additionally advantageously, the squeegee has outwards angled extensions 28, 29 of the squeegee 12 for extra contact to the floor or corresponding surface to be cleaned, when the handle arm is near to a horizontal position, for example in situations of cleaning under furniture.

[0039] Opposite surface to the head surface 19 of the

frame part 11 of the cleaning tool 19 is advantageously planar and thus cleaning targets near walls or like is also easily reached.

[0040] The mounting part 16 has advantageously fastening means for fastening the handle arm releasably to the mounting part 16. The fastening means can be of the type known as such to one skilled in the art, for example threaded fastening means or quick fastening means or fitting fastening means.

[0041] In the description in the foregoing, although some functions and elements have been described with reference to certain features and examples, those functions and elements may be performable by other features and examples whether described or not. Although features have been described with reference to certain embodiments or examples, those features may also be present in other embodiments or examples whether described or not.

[0042] Above only some advantageous examples of the inventions have been described to which examples the invention is not to be narrowly limited and many modifications and alterations are possible within the invention.

[0043] Reference signs used in the drawing:

10	cleaning tool
11	frame part
12	squeegee
13	support part of the squeegee
14	attachment part of the squeegee
15	turning joint
16	mounting part of a handle arm
17	bristles
18	attachment groove for the attachment part of the squeegee
19	head surface
20	engagement part for a cleaning cloth
21	longitudinal guide
22	slide
23	engagement element
24, 25	retaining protrusion of the attachment groove
26	support part of the bristles
27	groove of the frame part for the support part of the bristles
28, 29	angled extension of the squeegee
A	angle between the frame part and the mounting part
R	turning direction
S	sliding direction

Claims

1. Multi-function cleaning tool, which cleaning tool (10) comprises a frame part (11), which frame part (11) is longitudinal and substantially rectangular in shape, which cleaning tool (10) comprises a mounting part (16) for a handle arm, and engagement elements (20) for a cleaning cloth, **characterized in that** the frame part (11) further comprises on one longitudinally extending side bristles (17) and on other longitudinally extending side a squeegee (12), that the frame part (11) comprises a head surface (19) to which the mounting part (16) is attached by a turning joint (15) and to which the engagement elements (20) are attached, and that the turning joint (15) for the mounting part (16) is located in middle part of the head surface (19) of the frame part (11) and configured to provide a turning movement (R) of the frame part (11) around its center such that depending on need of cleaning either the longitudinal side of the bristles (17) is locatable against a floor or corresponding surface to be cleaned or the longitudinal side of the squeegee (12) is locatable against the floor or corresponding surface to be cleaned.

2. Multi-function cleaning tool according to claim 1, **characterized in that** the frame part (11) has a propeller-like movement (R) around its center and the turning joint (16).

3. Multi-function cleaning tool according to claim 1 or 2, **characterized in that** the bristles (17) and/or the squeegee (12) are releasably attached to the frame part (11).

4. Multi-function cleaning tool according to any of the previous claims, **characterized in that** the bristles (17) comprise a support part (26) and that the bristles (17) are attached to a support part (26), which is attached to the frame part (11) releasably.

5. Multi-function cleaning tool according to any of the previous claims, **characterized in that** the squeegee (12) comprises an attachment part and the frame part (11) comprises an attachment groove (18) and that the attachment part (14) of the squeegee (12) is releasably located in the attachment groove (18) of the frame part (11).

6. Multi-function cleaning tool according to claim 5, **characterized in that** the attachment part (14) and the attachment groove (18) have from fitting forms providing the releasable attachment of the squeegee (12) to the frame part (11).

7. Multi-function cleaning tool according to claim 5 or 6, **characterized in that** the attachment groove (18) has retaining protrusions (24, 25) at each outer edge of the attachment groove (18) for retaining the attachment part (14) of the squeegee (12) in the attachment groove (18) of the frame part (11).

8. Multi-function cleaning tool according to any of the previous claims, **characterized in that** the mounting part (16) is located on the head surface (19) of the

frame part (11) in an inclined position such that an angle (A) less than 90 degrees, advantageously less than 45 degrees, more advantageously 25 - 35 decrees, is formed between imaginary center axis of the mounting part (16) and the head surface (19) the frame part (11).

9. Multi-function cleaning tool according to any of the previous claims, **characterized in that** the engagement part (20) comprises a longitudinal guide (21) located on the frame part (11) and a slide (22) configured to slide on the longitudinal guide (21) in a sliding direction (S) from first position to a second position towards center part of the frame part (11).

10. Multi-function cleaning tool according to claim 9, **characterized in that** the engagement part (20) comprises an engagement element (23) for the cleaning cloth located on the slide (22), to which engagement element an engagement hole of the cleaning cloth to is be located for attachment of the cleaning cloth to the frame part (11) of the cleaning tool (10).

11. Multi-function cleaning tool according to any of the previous claims, **characterized in that** the squeegee (12) has a pointed cleaning edge for sharp line-shaped contact to the floor or corresponding surface to be cleaned.

12. Multi-function cleaning tool according to any of the previous claims, **characterized in that** the squeegee (12) has outwards angled extensions (28, 29) of the squeegee (12).

13. Multi-function cleaning tool according to any of the previous claims, **characterized in that** opposite surface to the head surface (19) of the frame part (11) of the cleaning tool (10) is planar.

14. Multi-function cleaning tool according to any of the previous claims, **characterized in that** the mounting part (16) has advantageously fastening means for fastening the handle arm releasably to the mounting part (16).

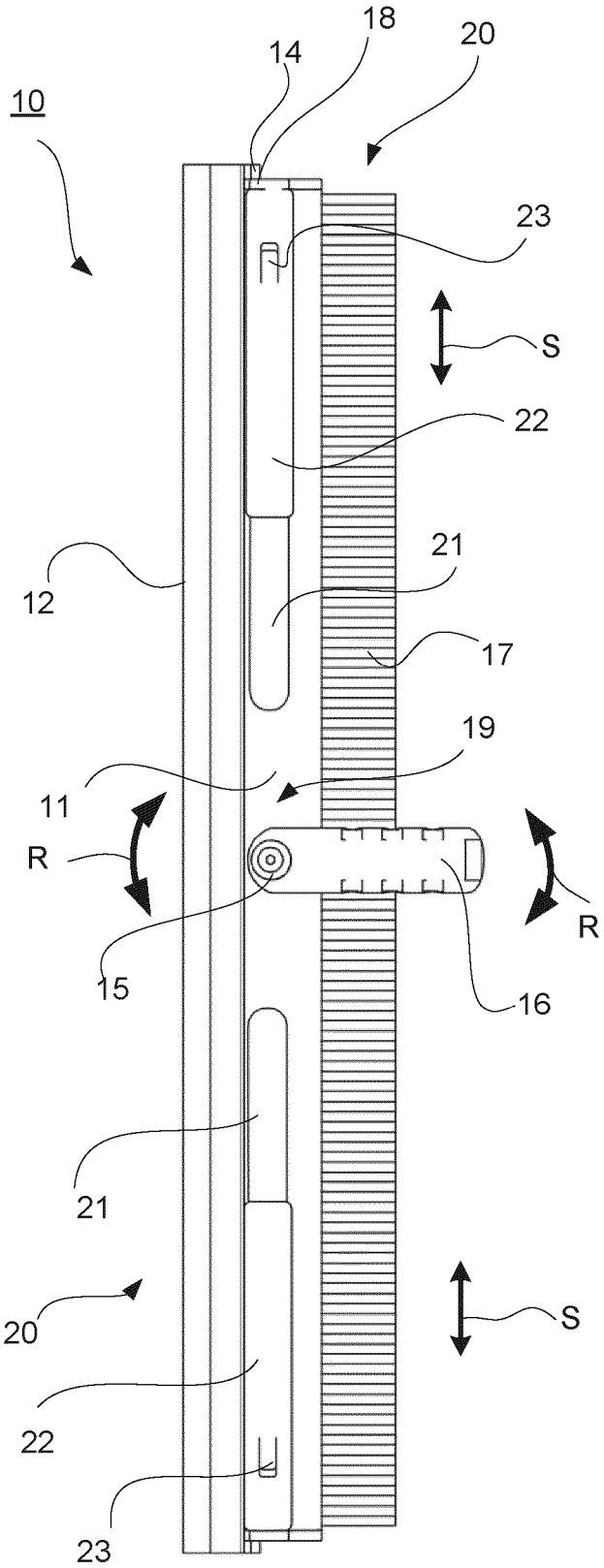

Fig. 1A

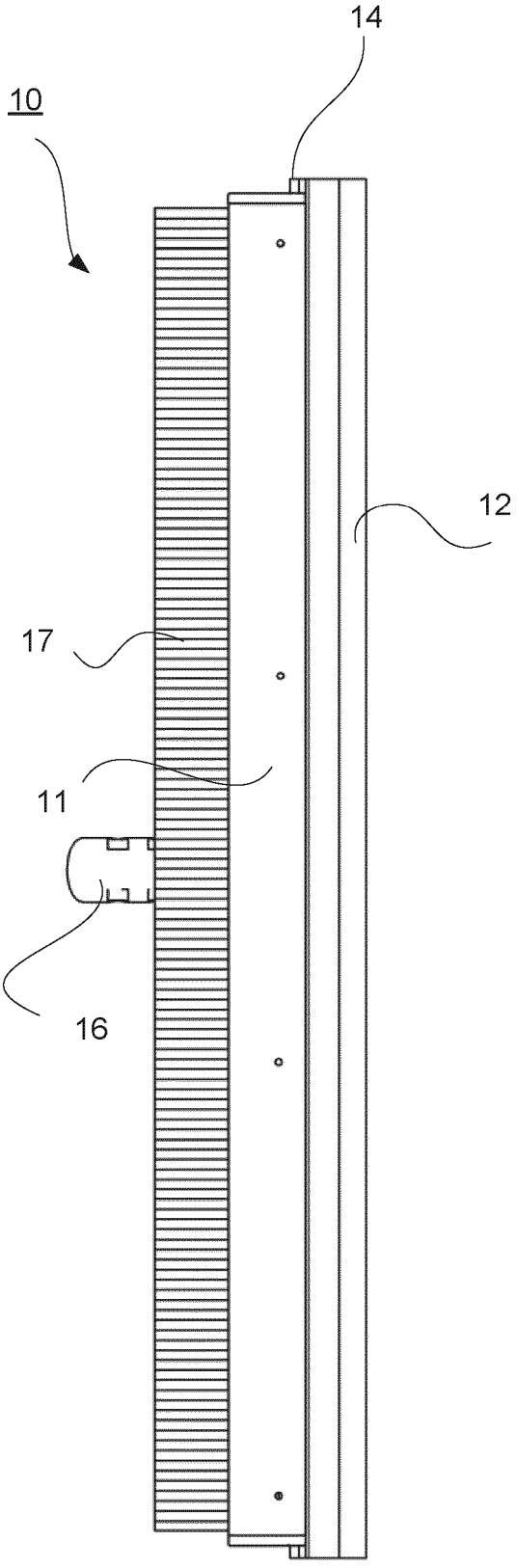

Fig. 1B

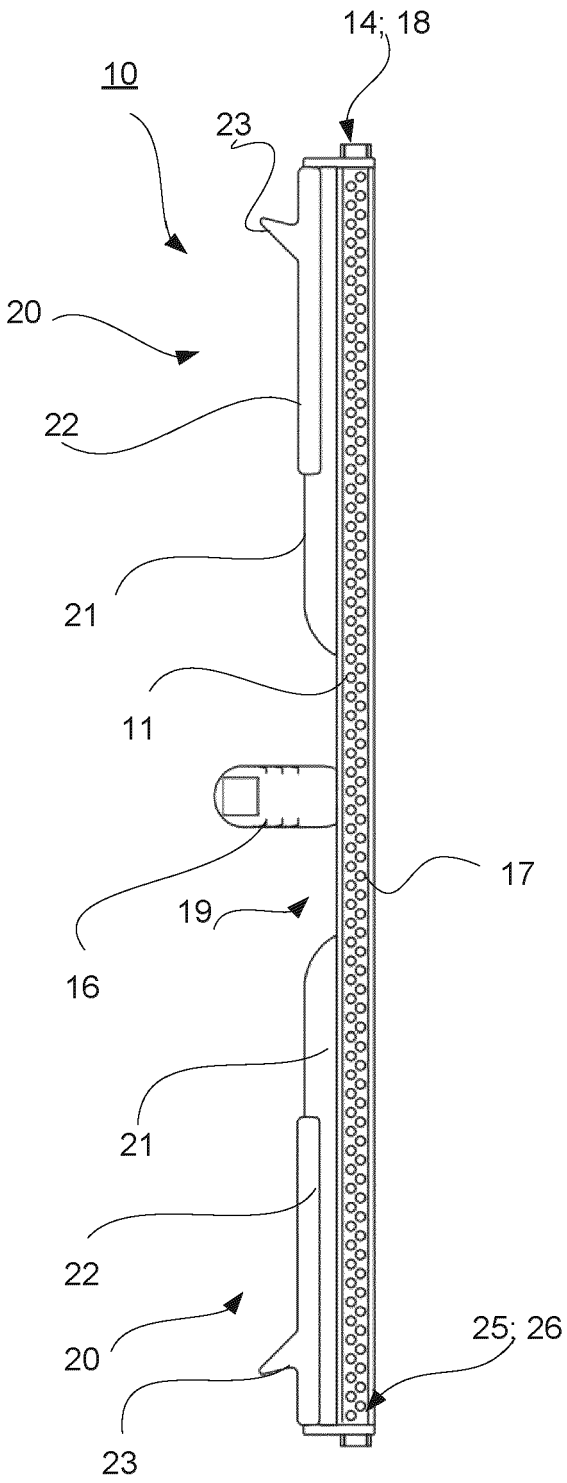
14; 18
10
23
20
22
21
11
17
19
16
21
22
20
25; 26
23

Fig. 2A

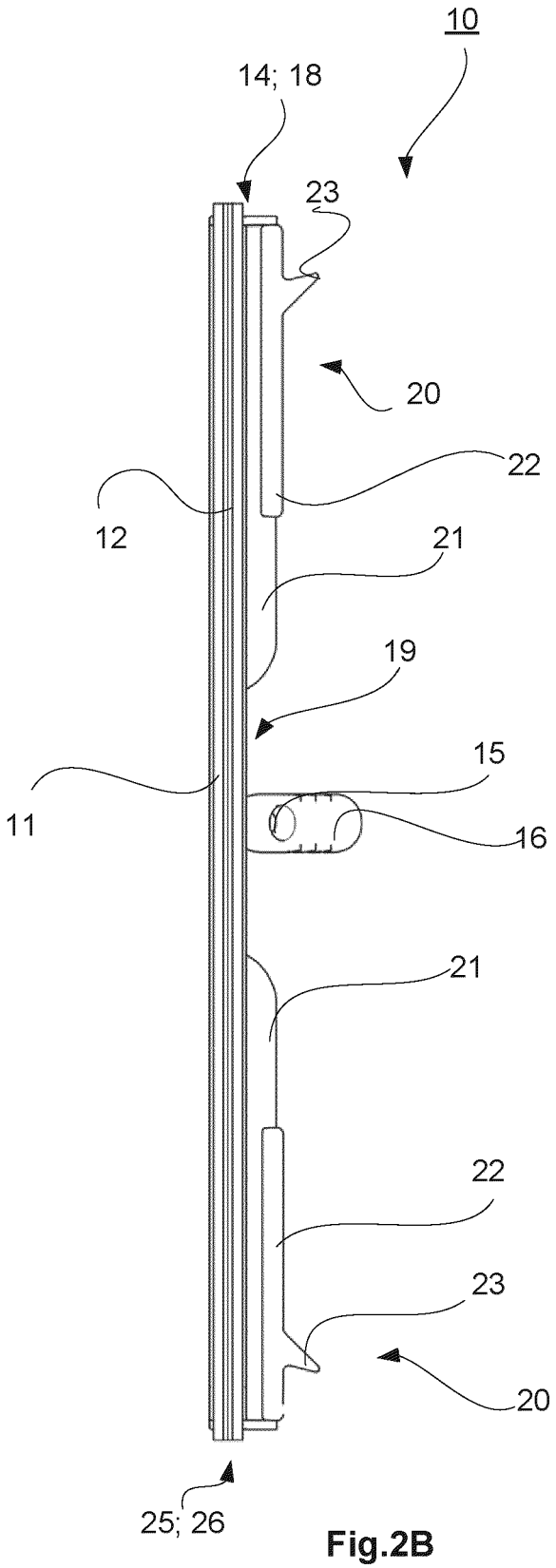
10
14; 18
23
20
22
12
21
19
15
11
16
21
22
23
20
25; 26

Fig.2B

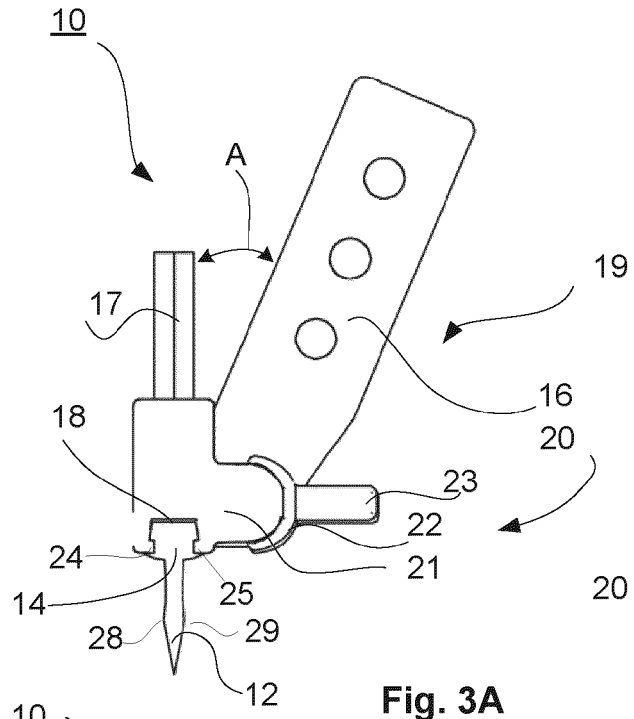

Fig. 3A

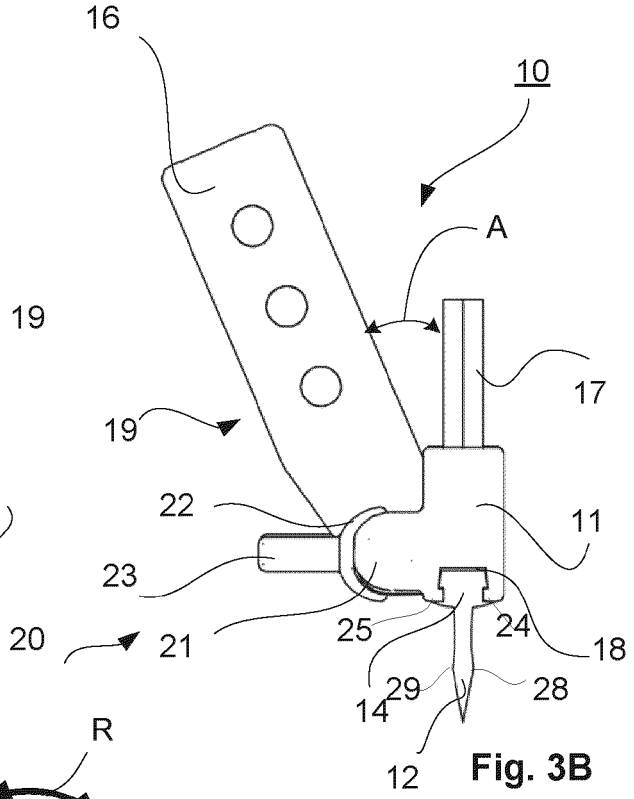

Fig. 3B

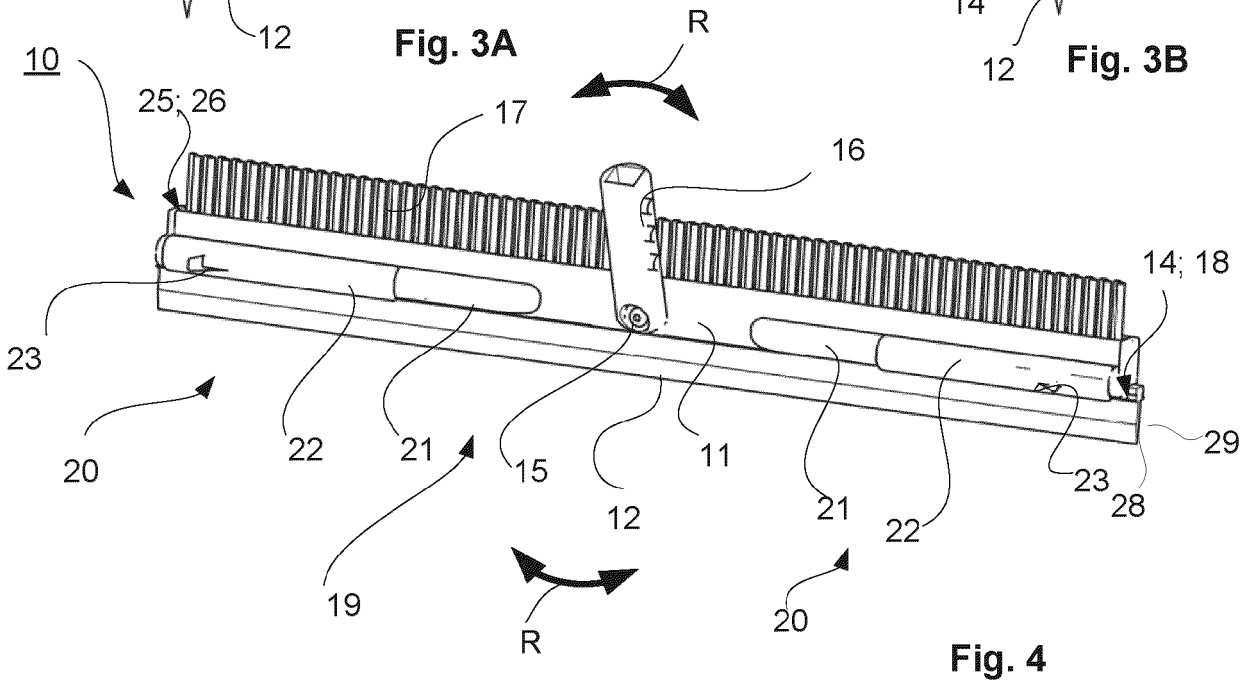

Fig. 4

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 21 15 5895

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	EP 3 207 851 A1 (AQUASTAR INC [US]) 23 August 2017 (2017-08-23)	1,13	INV. A47L13/11
Y	* paragraphs [0029] - [0030] *	3-7, 9-12,14	A47L13/12 A47L13/16
A		2,8	A47L13/255 A47L13/256
Y	US 3 795 933 A (SEUFERT G) 12 March 1974 (1974-03-12) * column 4, lines 46-68 *	3,4	
Y	EP 0 074 525 A1 (LEIFHEIT INTERNATIONAL [DE]) 23 March 1983 (1983-03-23) * page 4, paragraph 1 *	3,5-7	
Y,D	EP 3 569 132 A1 (REAX INNOVATIONS OY [FI]) 20 November 2019 (2019-11-20) * paragraphs [0022] - [0026] *	9,10	
Y	US 2007/266510 A1 (WEAVER JACE ALAN [US]) 22 November 2007 (2007-11-22) * paragraph [0017] *	11,12	TECHNICAL FIELDS SEARCHED (IPC)
Y	WO 2009/064238 A1 (FAST INDUSTRIPRODUKTER HB [SE]; SHAEHLE RANGAR [SE]) 22 May 2009 (2009-05-22) * figures 15-18 *	14	A47L

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	22 June 2021	Eckenschwiller, 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)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 21 15 5895

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.

22-06-2021

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 3207851 A1	23-08-2017	EP 3207851 A1	23-08-2017
		US 2017231453 A1	17-08-2017
US 3795933 A	12-03-1974	NONE	
EP 0074525 A1	23-03-1983	DE 3136401 A1	31-03-1983
		EP 0074525 A1	23-03-1983
EP 3569132 A1	20-11-2019	NONE	
US 2007266510 A1	22-11-2007	US 2007266510 A1	22-11-2007
		US 2010140836 A1	10-06-2010
WO 2009064238 A1	22-05-2009	NONE	

EPO FORM P0459

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

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- EP 3207851 A1 **[0003]**
- FI 11050 U **[0004]**
- EP 3569132 A1 **[0005] [0036]**