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

(11) **EP 2 138 240 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
30.12.2009 Bulletin 2009/53

(21) Application number: **08104571.8**

(22) Date of filing: **27.06.2008**

(51) Int Cl.:
B05C 17/00 *(2006.01)* ***B05C 17/005*** *(2006.01)*
B65D 83/16 *(2006.01)* *B05C 17/01* *(2006.01)*

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

(71) Applicant: **Hetra ApS**
8700 Horsens (DK)

(72) Inventor: **Nørskov, Niels Erik**
7870 Råslev (DK)

(74) Representative: **Holme Patent A/S**
Vesterbrogade 20
1620 Copenhagen V (DK)

(54) **Liquid applicator and method for applying liquid to a surface**

(57) The present invention relates to an applicator (1) for receiving a collapsible liquid container (4) and for applying liquid from the container (4) to a surface. The applicator (1) comprises at least one elongated guide member (2), fastening means (3) for releasably fastening the collapsible container (4) to the guide member (2), at least one sliding element (5) with a press member (18), which sliding element (5) is arranged to slide axially relative to the guide member (2), and handling means for axially sliding the sliding element (5) relative to the guide member (2) for squeezing the fastened collapsible container (4) by means of the press member (18). The present invention furthermore relates to a method for applying liquid from a collapsible liquid container (4) to a surface by using the applicator (1) according to the present invention.

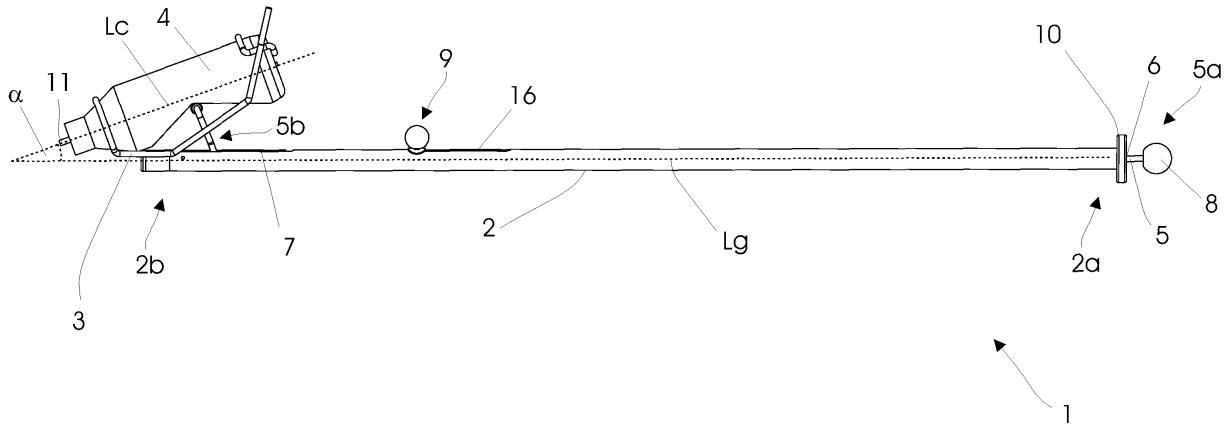

Fig. 2

EP 2 138 240 A1

Description

[0001] The present invention relates to an applicator for receiving a collapsible liquid container and for applying liquid from the container to a surface. The present invention furthermore relates to a method for applying liquid from a collapsible liquid container to a surface by using the applicator according to the present invention.

[0002] Liquids such as viscous liquids like glue or adhesives often need to be applied to surfaces that are not easily and/or conveniently accessible. This includes activities like gluing together laminate floor panels or wooden boards. Panels or boards of this kind are often provided with grooves and tongues by means of which two or more panels are fixed to each other. Glue is usually dispensed near or within the grooves, where after the panels are forced together by pressing action.

[0003] When laying a laminate floor usually many, sometimes hundreds of, laminate floor panels need to be glued together in this fashion. Commonly, the craftsperson will kneel or crouch on the floor to perform the above-described work with a hand-held tube of glue. Also, the craftsperson will usually have to shift position when applying glue to the entire length of a panel.

[0004] Glue that is suitable for the above-discussed purpose usually comes in collapsible plastic containers which comprise a nozzle for application of the glue. A typical container may be bottle-shaped and may contain a volume of 750 mL. An example of such a product is "Laminate Floor 433" as distributed by Dana Lim A/S, Københavnsvej 220, DK-4600 Køge, Denmark.

[0005] As described above, a craftsperson will typically hold such a container in his hand, which is cumbersome and time-consuming, especially if glue has to be applied to many surfaces of large spatial extent. In this case it would be expedient to use the glue container in combination with an applicator which allows for a precise glue dosage, and which also helps to increase the region of accessibility. Furthermore, it would be useful to employ an applicator which allows the craftsperson or the operator to apply glue while standing, rather than kneeling on the floor or climbing on a ladder.

[0006] U.S. Patent No. 3,974,943 discloses a dispensing device with a housing that can be attached to a wall or a support. A collapsible tube is placed into the housing, such that the neck of the tube protrudes through an aperture in the housing. The tube is squeezed by means of a press member with a handle, where the press member is located within the housing and the handle extends to the outside of the housing via a slot in the same. The handle is substantially perpendicular to the longitudinal axis of the housing. For dispensing liquid, the handle must be moved sideways, which makes it necessary that the operator's hand be at the same level as the press member, in a plane perpendicular to the longitudinal axis of the housing. Also, the collapsible tube needs to be fitted within the housing which implies time-consuming changing of tubes as well as the fact that the tube in use is not visible and inspectable.

[0007] The main disadvantage with this and other so-far known application or dispensing devices is that they are not suitable for applying liquid to surfaces that are remote, inaccessible, and/or not-conveniently accessible by the operator.

[0008] Thus, it is a first aspect of the present invention to provide an applicator that facilitates the application of liquids to surfaces that are out of reach or not easily accessible for the person operating the applicator.

[0009] It is a second aspect of the present invention to provide an applicator that allows the application of liquid in a precise and controllable manner.

[0010] It is a third aspect of the present invention to provide an applicator that has a simple and cost-effective construction.

[0011] It is a fourth aspect of the present invention to provide an applicator which enables an easy and quick changing of the collapsible container used in connection with the applicator.

[0012] It is a fifth aspect of the present invention to provide an expedient method for applying liquid from a collapsible liquid container to a surface by using the applicator according to the present invention.

[0013] The new and unique way in which the present invention fulfils the above-mentioned aspects is to provide an applicator which comprises at least one elongated guide member with a proximal end, a distal end and a longitudinal guide member axis, fastening means for releasably fastening a collapsible container to the guide member, at least one sliding element with a proximal end, a distal end, a longitudinal sliding element axis and a press member, which sliding element is arranged to slide axially relative to the guide member, and handling means for axially sliding the sliding element relative to the guide member for squeezing the fastened collapsible container by means of the press member. Due to the elongated guide member it is possible to access surfaces that are inaccessible or only inconveniently accessible when holding the container in the hand, or when using so-far known liquid applicators. The sliding element, which is axially movable relative to the elongated guide member conveniently allows liquid to be applied by simple, space-efficient axial movement. Since the collapsible container is fastened to the guide member the applicator of the present invention constitutes a compact, stable and easily operated unit.

[0014] As used herein, the terms "proximal end" and "distal end" refer to the end that is closer to the operator and the end that is further from the operator, respectively, when the applicator of the present invention is in use.

[0015] The collapsible container may be any liquid container from which liquid can be expelled by squeezing the container. Typically, such containers will comprise a bottle-shaped or cylindrical housing made of one or more polymers. Such containers are often used for adhesives, glues, impregnating agents or other liquids that are used in handcraft. Typically, such containers will also comprise

a nozzle. As used herein, the term "liquid" should be understood as any flowable substance including emulsions, colloidal compositions, or gels.

[0016] The fastening means for releasably fastening a collapsible container to the guide member may include any conventional fastening means well known in the art, for example frames, straps, screws, adhesives or the like. The press member of the applicator according to the present invention may be an integral part of the distal end of the sliding element. The handling means for axially sliding the sliding element relative to the guide member may comprise a simple handle or a knob which may conveniently be fastened to the proximal end of the sliding element. The term "axially sliding the sliding element relative to the guide member" implies that the movement of the sliding element occurs substantially parallel to the longitudinal axis of the guide member.

[0017] In one embodiment the applicator according to the present invention further comprises at least one spring for spring-biasing the distal end of the sliding element towards the proximal end of the guide member. The operator handling the applicator of the present invention will axially displace the sliding element from its starting position towards the distal end of the guide member, thereby squeezing the fastened container. By means of the spring-bias the sliding element will be displaced towards its starting position as soon as the operator lets go of the handling means attached to the sliding element. The container will then no longer be squeezed, but may elastically revert to its original, non-collapsed form. It is thereby achieved that accidental spillage and waste of liquid is avoided as soon as the operator stops pushing the sliding element forward, that is, in a distal direction. The spring may be arranged at any position along the applicator. Also, the person skilled in the art will readily recognize that two or more springs may be provided, depending on the task to be achieved by using the applicator.

[0018] Advantageously, the applicator further comprises means for compressing the spring without moving the sliding element. Since the spring biases the sliding element towards the proximal end of the guide member, the sliding element can obviously be used to compress the spring by sliding it towards the distal end of the guide member. However, this embodiment provides for additional spring compression means, the spring compression means being independent of moving the sliding element. The spring compression means may include any mechanism that compresses the spring from its other end, that is, the end that is not engaged by the sliding element. This may comprise a screw mechanism, a sliding mechanism or any other technique well known in the art.

[0019] According to a preferred embodiment of the present invention the compression means comprises a slider which is movable parallel to the longitudinal sliding element axis. The slider may engage the spring at its end that is not engaged by the sliding element. The slider may be axially displaced to compress the spring, where after the slider may be fastened to the guide member, for example by means of a screw and a screw nut. By implementing these additional compression means, the force needed to displace the sliding element axially towards the distal end of the guide member may be adjusted. Thereby, a more precise dosing of the applied liquid may be achieved. A more compressed spring will necessitate a greater force per distance displacement of the sliding element than a less compressed spring.

[0020] In a particularly advantageous embodiment of the present invention the fastening means comprise a bottle cage that is arranged at the distal end of the guide member. A bottle cage is a device for holding or fastening containers, such as water bottles, which is known, for example, from bicycles. A bottle cage may comprise a frame consisting of one or more elements made of one or more polymers, metals and/or carbon fiber. According to the present embodiment, the bottle cage is arranged at, or fastened to, the distal of the guide member. Thereby, the entire length of the guide member is taken advantage of.

[0021] According to yet another embodiment of the present invention the bottle cage comprises at least one foot for resting the applicator onto a surface in a stable position.

[0022] According to a particularly useful embodiment of the present invention the bottle cage comprises two feet which, together with the proximal end of the sliding element or with the handling means, form a triangle upon which the applicator can be rested in a stable position. This triangle may also involve the handling means, for example a knob, if the latter is mounted directly to the proximal end of the sliding element. In this case, it is rather a triangle consisting of the two feet of the bottle cage and the knob mounted to the proximal end of the sliding element.

[0023] According to a preferred embodiment of the present invention the fastening means are arranged in such a way that an angle is formed between the longitudinal guide member axis and the longitudinal container axis when the container is fastened to the guide member. The magnitude of this angle will be determined by the fastening means, for example by the bottle cage, and its inclination with respect to the longitudinal guide member axis. One of skill will appreciate that the fastening means may also be arranged such, that said angle might vary. This could be achieved by a bottle cage which is adjustable with respect to its inclination.

[0024] Preferably, the distal end of the sliding element comprises the press member, where said press member is bar-shaped and perpendicular to the longitudinal guide member axis. In this embodiment, the press member is an integral part of the distal end of the sliding element. The press member may advantageously be normal to the plane in which the longitudinal axis of the container and the longitudinal axis of the guide member lie. This arrangement allows for a smooth and steady expulsion

of liquid from the container.

[0025] Advantageously, the guide member and the sliding element have a relative arrangement which, in at least one position, allows for both axial movement of the sliding element and rotational movement of the sliding element around its longitudinal axis relative to the guide member.

[0026] According to a particularly expedient embodiment of the present invention the elongated guide member is a hollow casing, which comprises a first opening and a second opening in the casing, where the sliding element is arranged to slide within the casing, where the proximal end and the distal end of the sliding element extend to the outside of the casing through the first and the second opening, respectively. Advantageously, the first opening and the second opening will be placed at, or close to, the proximal end and the distal end of the guide member, respectively. In this context, the term "close to" may comprise placing the openings at a distance of up to 5 or 10 cm from the distal end and the proximal end, respectively. The first opening may, for example, be a circular hole in the proximal end of the casing. The second opening may, for example be a slot arranged close to the distal end of the casing. The casing may advantageously be of cylindrical shape. The casing and the sliding element may, for example, be made of a metal, such as aluminum.

[0027] Advantageously, the second opening is an L-shaped slot. Forming the slot in such a way may allow for both axial movement of the sliding element and rotational movement of the sliding element around its longitudinal axis relative to the guide member, the latter of which may be a hollow casing.

[0028] Preferably, the guide member has a length of at least 50 cm. By implementing the guide member with a length of at least 50 cm it may be ensured that the applicator provides a satisfactory range.

[0029] According to yet another embodiment of the present invention the handling means are attached to the proximal end of the sliding element. The handling means may, for example, comprise a knob, or any other type of handle or grip. By attaching the handling means to the proximal end of the sliding element a particularly convenient operation of the applicator is enabled.

[0030] The present invention also concerns a method for applying liquid from a collapsible liquid container to a surface by using the applicator according to the present invention, the method comprising the steps of fastening the collapsible container to the guide member, axially displacing the sliding element by means of the handling means, thereby squeezing the fastened collapsible container by means of the press member.

[0031] The invention will be explained in greater detail below where further advantageous properties and example embodiments are described with reference to the drawing, in which

Fig. 1 shows a side elevational view of an applicator according to the present invention, where the sliding element is in a first position,

Fig. 2 shows a side elevational view of an applicator according to the present invention, where the sliding element is in a second position,

Fig. 3 is a cross sectional view of an applicator according to the present invention, where the sliding element is in a first position and the slider is in a first position,

Fig. 4 is a cross sectional view of an applicator according to the present invention, where the sliding element is in a first position and the slider is in a second position,

Fig. 5 is a cross sectional view of an applicator according to the present invention, where the sliding element is in a second position and the slider is in a second position,

Fig. 6 shows a first perspective view of an applicator according to the present invention,

Fig. 7 shows a second perspective view of an applicator according to the present invention,

Fig. 8 shows a third perspective view of an applicator according to the present invention, and

Fig. 9 is a perspective view of parts of an applicator according to the present invention.

[0032] The applicator 1 shown in Fig. 1 comprises an elongated guide member 2 with a proximal end 2a and a distal end 2b. The guide member 2 of this embodiment is implemented as a hollow casing.

[0033] At the proximal end 2a of the guide member 2 there is provided a collar 10, which facilitates the handling of the applicator 1. A bottle cage 3 is arranged at the distal end 2b of the guide member 2 for receiving a collapsible liquid container 4. The bottle cage 3 is arranged on the guide member 2 in such a way that when the container 4 is placed into the bottle cage an angle α, is formed between the longitudinal axis Lg of the guide member 2 and the longitudinal axis Lc of the container 4.

[0034] A sliding element 5, only part of which is visible in Fig. 1, is arranged to slide axially within the hollow guide member 2. The sliding element 5 comprises a proximal end 5a and a distal end 5b, the latter being formed as a bar-shaped press member 18. The latter is shown in Fig. 6-9. The proximal end 5a and the distal end 5b of the sliding element 5 extend to the outside of the guide member 2 through a first opening 6 and a second opening 7, respectively, in the guide member 2, as is best seen in Fig. 8. The sliding element 5 may be slid by using the knob 8 attached to the proximal end 5a of the sliding

element 5.

[0035] The applicator 1 shown in Fig. 1 also comprises a slider 9, which is axially movable relative to the guide member 2. The function of the slider 9 will be explained below.

[0036] In Fig. 1 the sliding element 5 is shown in a first position relative to the guide member 2. In this position the distal end 5a of the sliding element touches the collapsible container 4, but does not squeeze it. In Fig. 2 the sliding element 5 is shown in a second position relative to the guide member 2. Same parts are indicated with the same reference numerals in all figures. In this second position, the sliding element 5 is axially displaced towards the distal end 2b of the guide member 2. This results in the container 4 being squeezed by the bar-shaped press member 18 of the distal end 5b of the sliding element 5. Thereby, liquid is squeezed out of the container 4 through an opening or a nozzle 11 in the container 4. The sliding element 5 is continuously slidable relative to the guide member 2. As becomes apparent from the drawing different positions of the sliding element 5 relative to the guide member 2 will result in different degrees of squeezing, which results in different amounts of liquid squeezed out of the container 4 and applied to a surface. Parameters that influence the degree of squeezing and the amount of liquid squeezed out of the container 4 per distance of displacement of the sliding element relative to the guide member 2 include the shape of the press member 18, the distance between the bottle cage 3 and the guide member 2, and the value of the angle α.

[0037] Referring now to Fig. 3-5, there is shown a sectional view of the applicator 1 of the present invention where the guide member 2 is longitudinally cut while the remaining features are shown in a side elevational view. Features that are not visible in Fig. 1-2 include a spring 12 which is slidably wound around the sliding element 5, a first and a second guide element 13,14 and the lower part 9a of the slider 9 which extends into the hollow guide member 2. The proximal end 12a of the spring 12 engages with an anchoring point 15, the latter of which is fastened to the sliding element 5. The anchoring point 15 can, for example, be a ring that is welded around the sliding element. In any case should the anchoring point have a sufficiently large diameter to prevent the spring 12 from being displaced beyond this point towards the proximal end 5a of the sliding element. Similarly, the distal end 12b of the spring 12 engages with the lower part 9a of the slider 9, preventing the spring 12 from being displaced beyond the lower part 9a of the slider 9.

[0038] The slider 9 is releasably fixed to the guide member 2, for example by means of a screw centrally placed within the upper part 9b of the slider 9 engaging with a screw nut placed within the lower part 9a of the slider 9 (not shown). The slider 9 is axially slidable relative to the sliding element 5 in that the lower part 9a of the slider 9 comprises a through hole with a longitudinal axis that corresponds to the longitudinal sliding elment axis Ls. The latter is shown in Fig. 9. The sliding element 5 slides axially within the through hole of the slider 9. Accordingly, the diameter of the through hole is large enough to allow free axial movement of the sliding element 5. The diameter of the through hole is however smaller than the diameter of the spring 12, preventing the spring 12 from being displaced beyond the lower part 9a of the slider 9, as mentioned above. The spring 12 consequently spring-biases the distal end 5b of the sliding element 5 towards the proximal end 2a of the guide member 2. This direction is indicated by the arrow in Fig. 3. Displacing the sliding element 5 towards the distal end 2b of the guide member 2 will compress the spring 12 as can be seen when comparing Fig. 4 and 5.

[0039] As described above, the slider 9 is releasably fixed to the guide member 2. When released, the slider 9 may be axially displaced parallel to the longitudinal axis Lg of the guide member 2, for example along a third opening 16 in the surface of the hollow casing. The third opening 16 is best seen in Fig. 8. By axially displacing the slider 9 towards the proximal end 2a of the guide member 2 the spring 12 will be compressed, as is evident when comparing Fig. 3 and 4.

[0040] The function of the guide elements 13,14 is to ensure that the part of the sliding element 5, which is placed within the guide member 2, is placed in a substantially centered fashion with respect to the surrounding inner surface of the hollow guide member 2. Preferably, the guide elements 13,14 symmetrically surround the sliding element 5. The sliding element 5, the guide elements 14,15, and the guide member 2 are accordingly arranged in a co-axial fashion.

[0041] Referring now to Fig. 6 and 7, it can be seen that the bottle cage 3 comprises two feet 3a, 3b. By means of these feet 3a, 3b, the applicator 1 may be placed onto a surface, for example the floor, in a stable position. As shown in Fig. 7 the two feet 3a, 3b may form a triangle together with the proximal end 5a of the sliding element 5, which in this embodiment comprises a knob 8, upon which the applicator 1 can be rested. Due to the angle α which is formed between the longitudinal guide member axis Lg and the longitudinal container axis Lc, as shown in Fig. 1 and 2, the resting position, as shown in Fig. 7, implicates an upward inclination of the container 4 that prevents gravitational discharge of liquid from the container 4.

[0042] Fig. 8 shows the applicator 1 from yet another perspective. In this view the shapes of the second opening 7 and of the third opening 16 can be observed. The second opening 7 is in this embodiment implemented as an L-shaped slot. The long portion 7a of the L-shaped slot allows for axial movement of the sliding element 5, whereas the short portion 7b of the L-shaped slot allows for rotational movement of the sliding element 5 around its longitudinal axis Ls (the latter is shown in Fig. 9). At the intersection of the long portion 7a and the short portion 7b of the L-shaped slot, both axial and rotational movement of the sliding element 5 around its longitudinal axis Ls are possible relative to the guide member 2. With

this arrangement it is possible to arrange the sliding element 5 in a position where axial movement of the same is prevented. Such a lock position may be expedient when the applicator is not in use and is to be placed in a stable position as shown in Fig. 7. Furthermore, the ability for rotational movement of the sliding element 5 may be taken advantage of when removing and/or inserting a collapsible container 4 into the bottle cage 3. It is convenient to remove or insert a container 4 when having rotated the distal end 5b of the sliding element 5 away from the bottle cage 3, as shown in Fig. 8. Another slot-shape that allows both for axial and rotational movement of the sliding element 5 is an E-formed slot (not shown).

[0043] The third opening 16 is formed as a slot 16 which allows movement of the slider 9 in the axial direction of the guide member 2.

[0044] Fig. 9 is a perspective view of parts of the applicator, where the guide member 2, which is shown in all the remaining figures, has been removed except for the collar 10. The sliding element 5 is shown with its proximal end 5a, its distal end 5b, and its longitudinal axis Ls. The tubular guide elements 13, 14 surround the sliding element 5.

[0045] The embodiments shown in the drawing are examples and should not be understood as limiting the scope of the present invention.

Claims

1. An applicator (1) for receiving a collapsible liquid container (4) with a longitudinal container axis (Lc) and for applying liquid from the container (4) to a surface, **characterized in that** the liquid applicator (1) comprises

   - at least one elongated guide member (2) with a proximal end (2a), a distal end (2b) and a longitudinal guide member axis (Lg),
   - fastening means (3) for releasably fastening the collapsible container (4) to the guide member (2),
   - at least one sliding element (5) with a proximal end (5a), a distal end (5b), a longitudinal sliding element axis (Ls) and a press member (18), which sliding element (5) is arranged to slide axially relative to the guide member (2), and
   - handling means (8) for axially sliding the sliding element (5) relative to the guide member (2) for squeezing the fastened collapsible container (4) by means of the press member (18).

2. The applicator (1) according to claim 1, **characterized in that** it further comprises at least one spring (12) for spring-biasing the distal end (5b) of the sliding element (5) towards the proximal end (2a) of the guide member (2).

3. The applicator (1) according to claim 2, **characterized in that** it further comprises means (9) for compressing the spring (12) without moving the sliding element (5).

4. The applicator (1) according to claim 3, **characterized in that** the compression means (9) comprises a slider (9) which is movable parallel to the longitudinal sliding element axis (Ls).

5. The applicator (1) according to any one of claims 1-4, **characterized in that** the fastening means comprise a bottle cage (3) that is arranged at the distal end (2b) of the guide member (2).

6. The applicator (1) according to claim 5, **characterized in that** the bottle cage (3) comprises at least one foot (3a) for resting the applicator (1) onto a surface (17) in a stable position.

7. The applicator (1) according to claims 5 or 6, **characterized in that** the bottle cage (3) comprises two feet (3a, 3b) which, together with the proximal end (5a) of the sliding element (5) or with the handling means (8), form a triangle upon which the applicator (1) can be rested in a stable position.

8. The applicator (1) according to any one of the preceding claims 1-7, **characterized in that** the fastening means (3) are arranged in such a way that an angle (α) is formed between the longitudinal guide member axis (Lg) and the longitudinal container axis (Lc) when the container (4) is fastened to the guide member (2).

9. The applicator (1) according to any one of the preceding claims 1-8, **characterized in that** the distal end (5b) of the sliding element (5) comprises the press member (18), where said press member (18) is bar-shaped and perpendicular to the longitudinal guide member axis (Lg).

10. The applicator (1) according to any one of the preceding claims 1-9, **characterized in that** the guide member (2) and the sliding element (5) have a relative arrangement which, in at least one position, allows for both axial movement of the sliding element (5) and rotational movement of the sliding element (5) around its longitudinal sliding element axis (Ls) relative to the guide member (2).

11. The applicator (1) according to any one of the preceding claims 1-10, **characterized in that** the elongated guide member (2) is a hollow casing (2), which comprises a first opening (6) and a second opening (7) in the casing (2), where the sliding element (5) is arranged to slide within the casing (2), where the proximal end (5a) and the distal end (5b) of the sliding

element (5) extend to the outside of the casing through the first opening (6) and the second opening (7), respectively.

12. The applicator (1) according to claim 11, **characterized in that** the second opening (6) is an L-shaped slot.

13. The applicator (1) according to any one of the preceding claims 1-12, **characterized in that** the guide member (2) has a length of at least 50 cm.

14. The applicator (1) according to any one of the preceding claims 1-13, **characterized in that** the handling means (8) are attached to the proximal end of the sliding element (5).

15. A method for applying liquid from a collapsible liquid container (4) to a surface by using the applicator (1) according to any one of the preceding claims 1-14, **characterized in that** the method comprises the steps of

- fastening the collapsible container (4) to the guide member (2),
- axially displacing the sliding element (5) by means of the handling means (8), thereby squeezing the fastened collapsible container (4) by means of the press member (18).

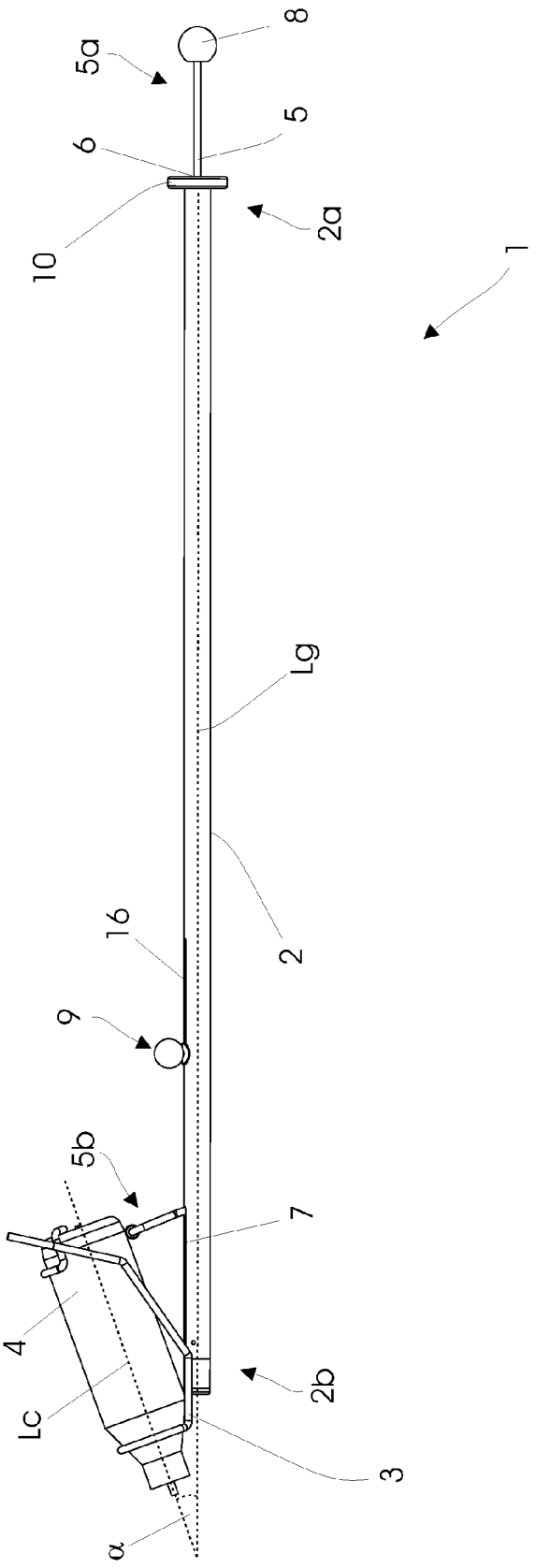

Fig. 1

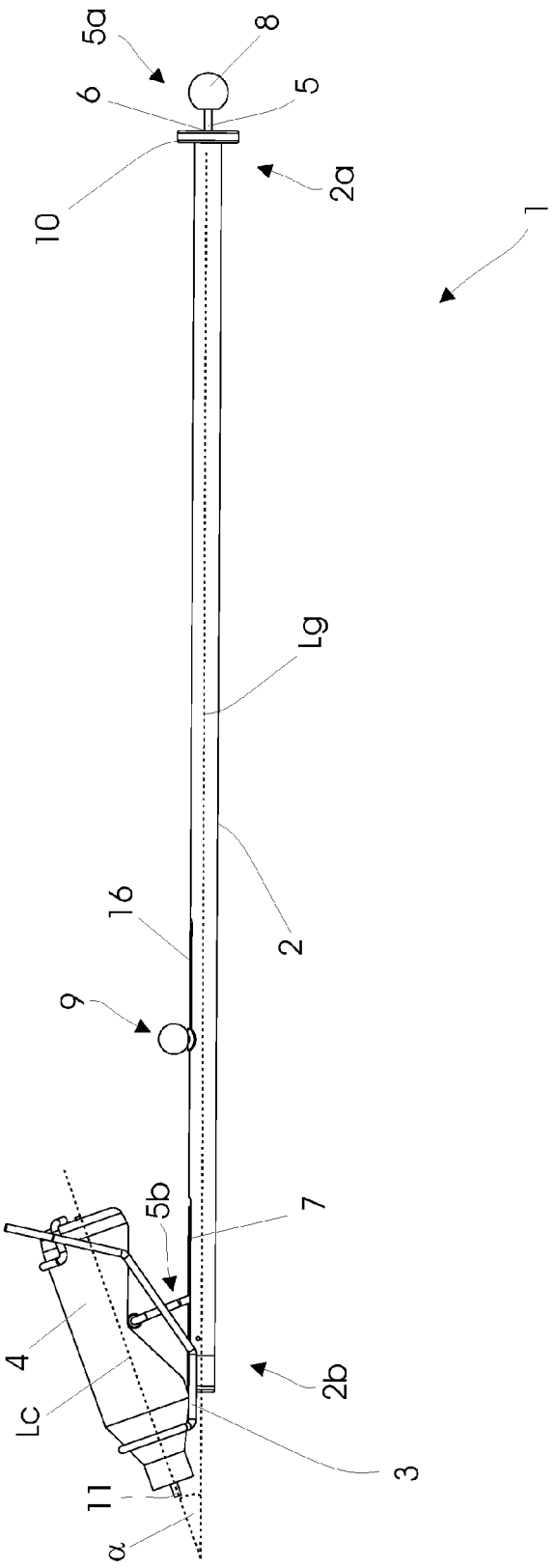

Fig. 2

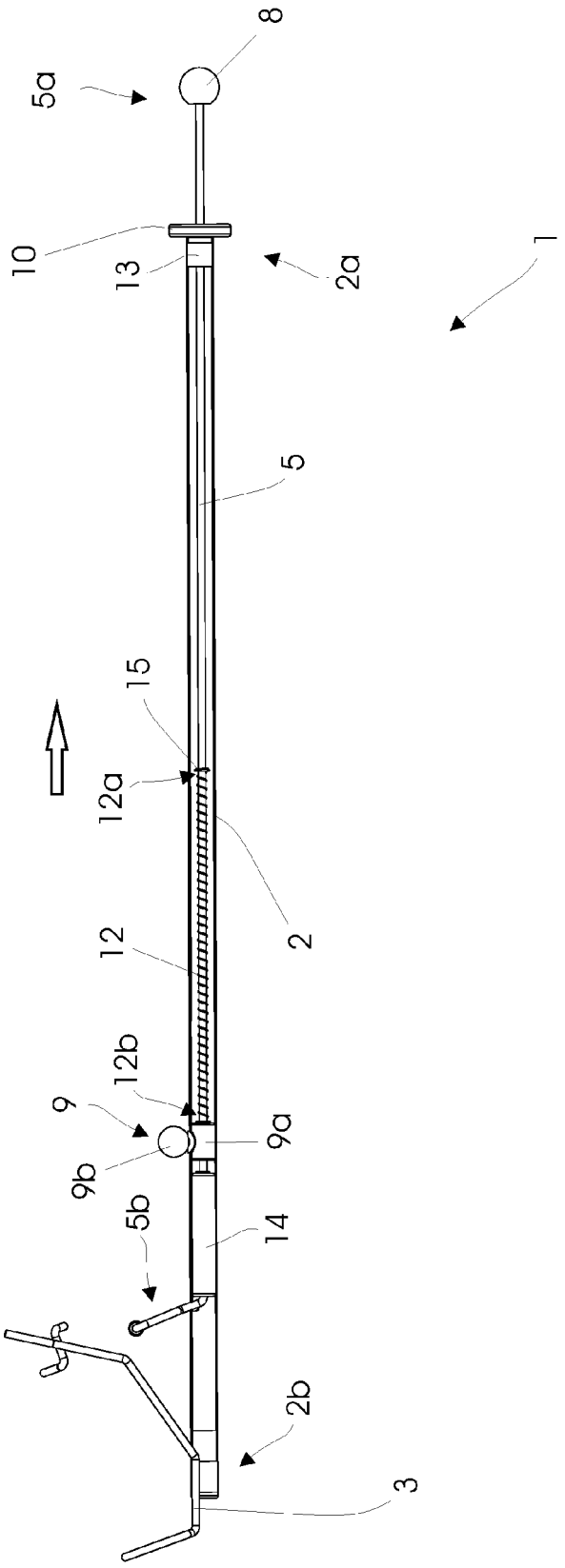

Fig. 3

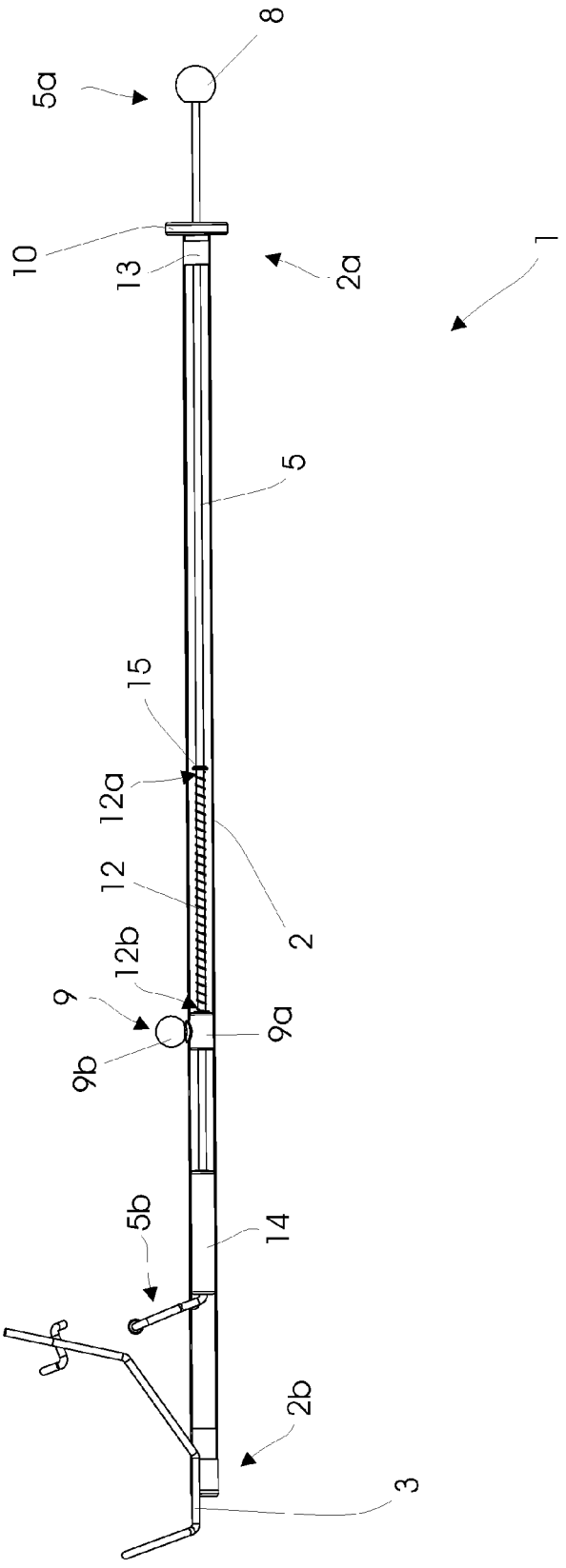

Fig. 4

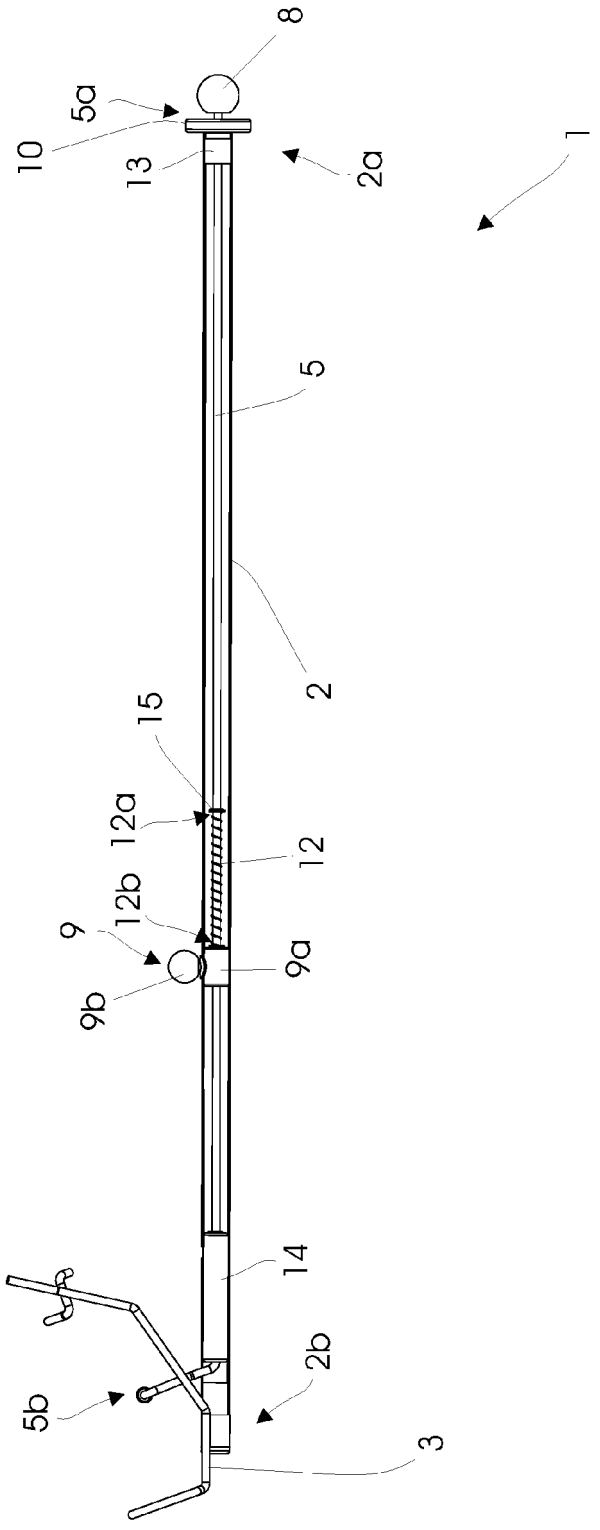

Fig. 5

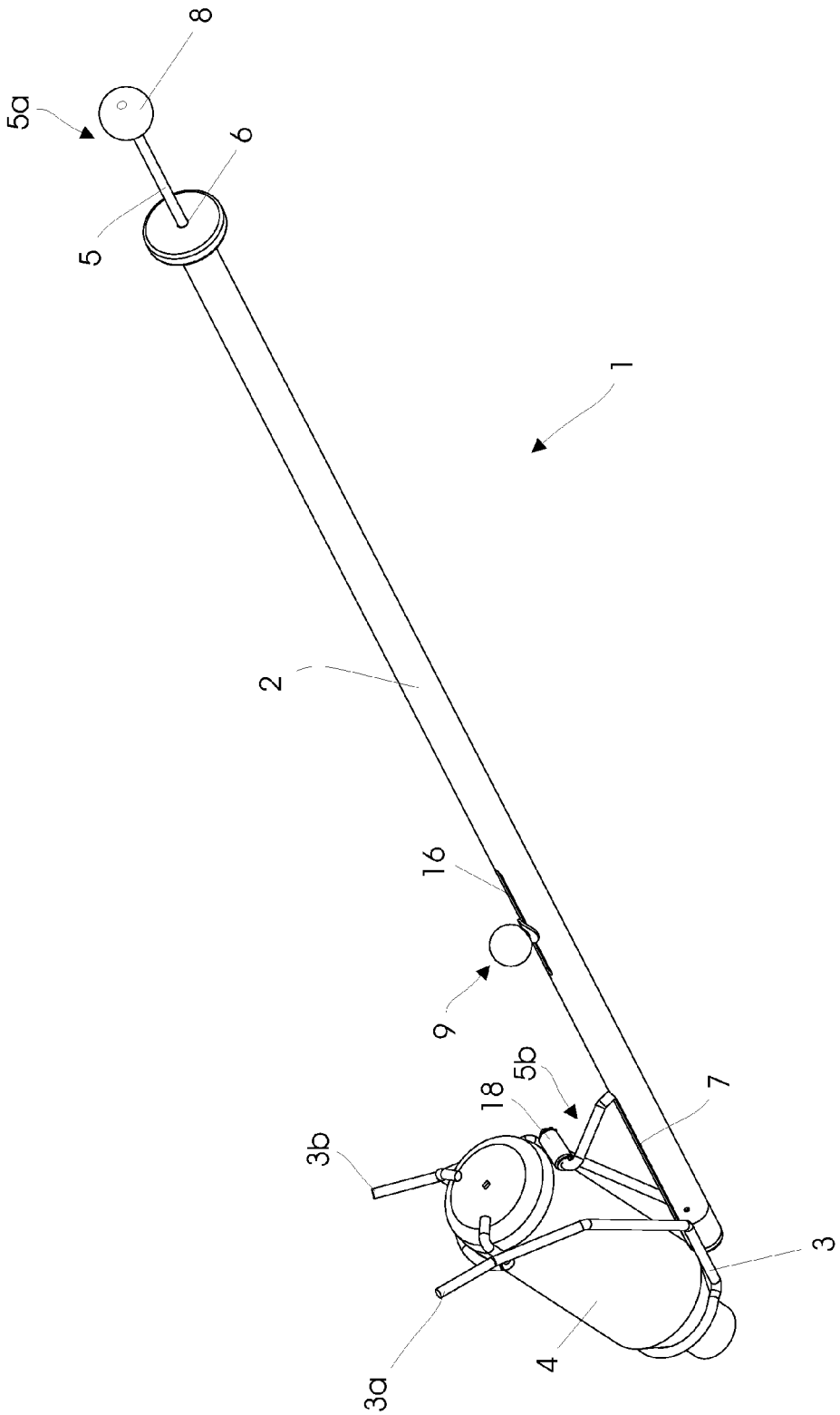

Fig. 6

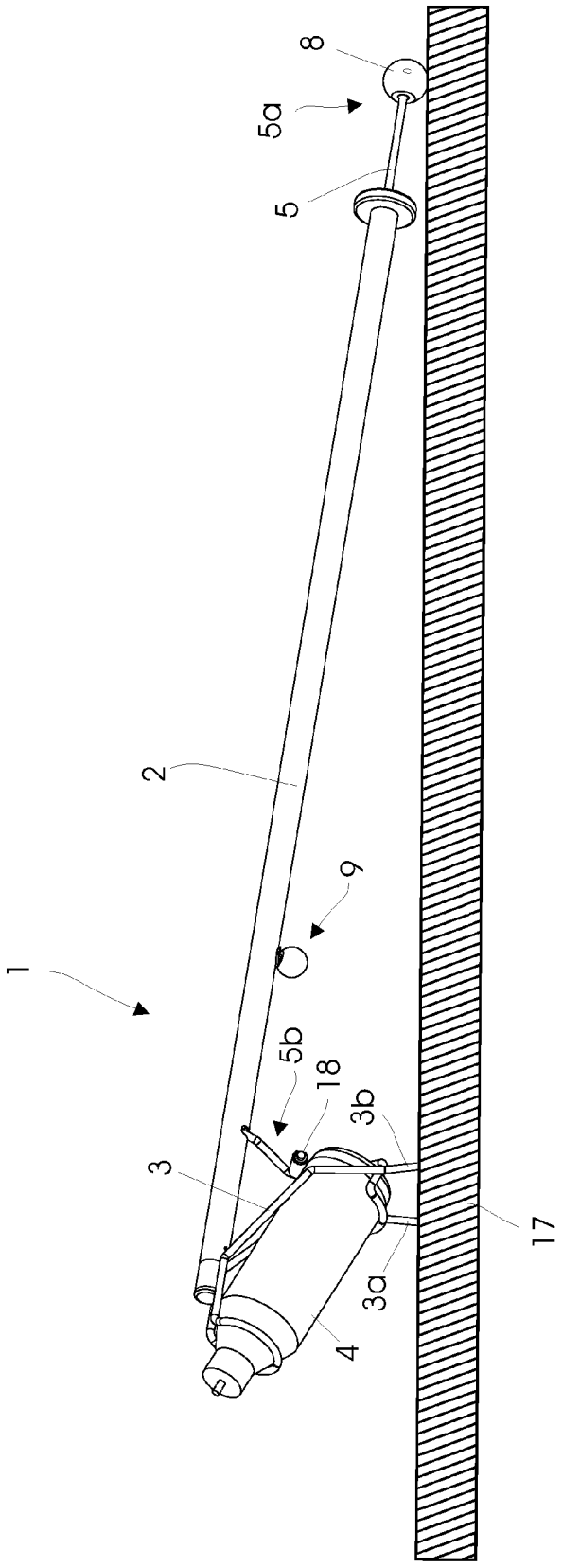

Fig. 7

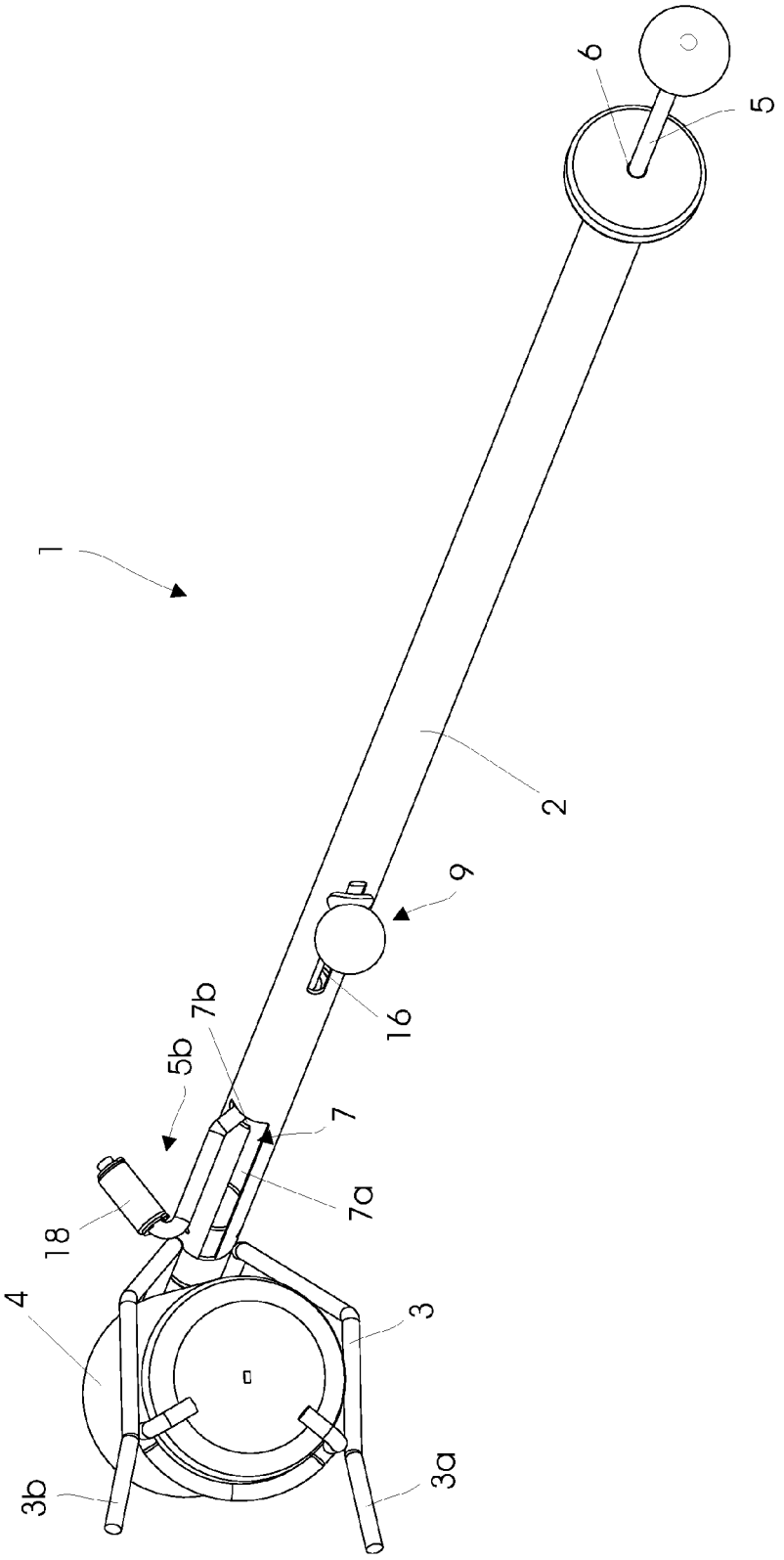

Fig. 8

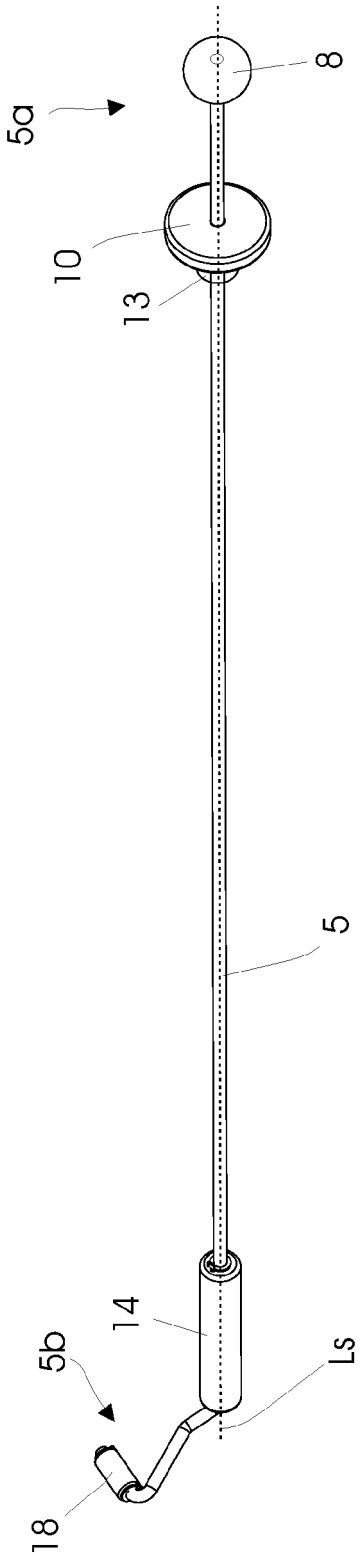

Fig. 9

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 08 10 4571

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	DE 299 07 413 U1 (GUSTAV BOUEKE & CO NACHFOLGER [DE]) 24 June 1999 (1999-06-24) * figures * -----	1-6, 8-10,13, 14	INV. B05C17/00 B05C17/005 B65D83/16
X	US 5 443 181 A (POPP FRANZ [DE] ET AL) 22 August 1995 (1995-08-22) * figure 1 * -----	1,11,12, 15	ADD. B05C17/01
X	DE 38 41 172 A1 (LORSBACH PAUL DIPL ING [DE]) 13 June 1990 (1990-06-13) * figures * -----	1	
X	US 2 575 124 A (POLLITT CHESTER R) 13 November 1951 (1951-11-13) * figures * -----	1,5-7	
X	WO 94/01254 A (FRIEDMAN MARK M [IL]; HAMMER MORDECHAI [IL]) 20 January 1994 (1994-01-20) * figure 1 * -----	1	
X	JP 07 222944 A (KUBOTA HOUSE KK; KUBOTA KK; KUBOTA HOUSE KK) 22 August 1995 (1995-08-22) * abstract; figure 3 * -----	1	TECHNICAL FIELDS SEARCHED (IPC) B65D B05C B05B
X	US 7 308 992 B1 (MINEAU STEVEN B [US] ET AL) 18 December 2007 (2007-12-18) * figures 8,9 * -----	1	
X	US 2004/042843 A1 (HUNT CHRISTOPHER J [US] ET AL) 4 March 2004 (2004-03-04) * figures 2,3 * -----	1	
X	BE 887 002 A1 (SMRT THOMAS JOHN) 4 May 1981 (1981-05-04) * figure 2 * -----	1	
	-/--		

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	26 November 2008	Pöll, Andreas

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)

4

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 08 10 4571

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	EP 0 514 206 A (FOX VALLEY SYSTEMS INC [US]) 19 November 1992 (1992-11-19) * figure 2 *	1	
A	FR 2 785 208 A (SAINT GOBAIN ISOVER [FR]) 5 May 2000 (2000-05-05) * figures 3,7 *	12	
A	US 3 782 598 A (BASA N) 1 January 1974 (1974-01-01) * figure 4 *	12	
			TECHNICAL FIELDS SEARCHED (IPC)

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	26 November 2008	Pöll, Andreas

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

4

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 08 10 4571

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.

26-11-2008

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 29907413 U1	24-06-1999	NONE	
US 5443181 A	22-08-1995	NONE	
DE 3841172 A1	13-06-1990	NONE	
US 2575124 A	13-11-1951	NONE	
WO 9401254 A	20-01-1994	AT 190257 T	15-03-2000
		AU 684467 B2	18-12-1997
		AU 4671993 A	31-01-1994
		BG 99346 A	29-09-1995
		BR 9306734 A	08-12-1998
		CA 2139659 A1	20-01-1994
		CZ 9500087 A3	13-03-1996
		DE 69328024 D1	13-04-2000
		DE 69328024 T2	23-11-2000
		DK 650405 T3	21-08-2000
		EP 0650405 A1	03-05-1995
		ES 2145779 T3	16-07-2000
		FI 950143 A	10-03-1995
		GR 3033640 T3	31-10-2000
		HU 75562 A2	28-05-1997
		JP 8500776 T	30-01-1996
		NZ 254563 A	23-12-1998
		OA 10000 A	29-03-1996
		PL 307161 A1	02-05-1995
		PT 650405 T	31-08-2000
		RO 116791 B1	29-06-2001
		SK 5195 A3	06-03-1996
JP 7222944 A	22-08-1995	NONE	
US 7308992 B1	18-12-2007	NONE	
US 2004042843 A1	04-03-2004	NONE	
BE 887002 A1	04-05-1981	NONE	
EP 0514206 A	19-11-1992	AT 140501 T	15-08-1996
		AU 655638 B2	05-01-1995
		AU 1612392 A	19-11-1992
		AU 661633 B2	27-07-1995
		AU 7434294 A	15-12-1994
		CA 2068663 A1	16-11-1992
		DE 69212227 D1	22-08-1996

EPO FORM P0459

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

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 08 10 4571

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.

26-11-2008

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0514206 A		DE 69212227 T2	30-04-1997
		DK 514206 T3	28-10-1996
		ES 2091407 T3	01-11-1996
		GR 3020856 T3	30-11-1996
		JP 2102321 C	22-10-1996
		JP 5139470 A	08-06-1993
		JP 7121379 B	25-12-1995
		NO 921903 A	16-11-1992
FR 2785208 A	05-05-2000	NONE	
US 3782598 A	01-01-1974	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

- US 3974943 A **[0006]**