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(54) **A set of ladder accessories**

Satz von Leiterzubehörteilen

Ensemble d'accessoires d'échelle

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to a set of ladder accessories comprising a right-hand and a left-hand ladder accessory for a ladder having ladder bars with a circular cross-section.

BACKGROUND ART

[0002] Ladders are a common means used to enable a user to reach higher, for example on a wall, a telephone post, or the like. Most ladders comprise two uprights, or ladder bars, which are interconnected by ladder steps. During use, the user climbs the ladder by stepping up on the ladder steps.

[0003] When the ladder is used, the most common set-up is to lean an upper portion of the ladder bars towards a surface, e.g. a wall, an outer corner of the wall, an inner corner of the wall, a telephone post, or the like. Due to the different shapes of e.g. a flat wall and a telephone post, an ordinary ladder will not be able to lean in a steady way against both kinds of surfaces. In the art, several attempts have been made to reduce the problem of leaning the ladder against surfaces having different shapes, and hence increase the flexibility of the ladder. US 6 691 825 describes a ladder accessory having two arms extending from a centre portion of a ladder step to give support for a ladder leaning towards an outer corner of a wall. The arms of US 6 691 825 can be mounted in two different ways to achieve two different positions, namely for enabling steady support for corners and for posts. US 6 691 825 does, however, fail to describe a solution to the problem of increasing a working area for a use of the ladder.

[0004] US 4 502 566 describes a ladder accessory adapted to increase the working area for a person standing on a ladder leaning towards a wall. This ladder accessory can only be used in one (or possibly two) position(s), and has hence a rather limited use. US 6 408 983 discloses a ladder accessory for being attached to an upper portion of the ladder bars of a ladder. The ladder accessory will help a user standing on the ladder to be suspended from the wall. The ladder accessory of US 6 408 083 can only be used in one position.

[0005] US 5 850 894 relates to a ladder kit comprising two supports (20) which are rotatable around a joint (30). The rotatability of the joint makes it possible to adjust the angle between the axis of the ladder stiles and the supports. It is not possible to adjust the width between the supports.

[0006] WO 2004/042182 discloses a ladder stabilizing device including securing means (1) engaged to a ladder side rail (2) by clamping at any one of a plurality of locations along the side rail, and a support strut (8) for locating against a structure and lockably engagable with the said securing means (1) in multiple positions with respect to

the securing means. The device according to this document is adapted to be fitted to a ladder having stiles with a square cross section. For stiles having different cross sections, the proposed fastening means (1) will not provide a sturdy enough fastening.

[0007] WO 94/29561 (by the same applicant as US 5 850 894) relates to a similar product as described in US 5 850 894.

[0008] US 2005/0023084 relates to a ladder support comprising an elongate beam extending through the axis of the stiles of the ladder. The elongate arm has a telescoping function, and the ends of the arm are provided with support feet (46) that can be leaned towards e.g. a wall. The telescoping function of the elongate arm makes it possible to adjust the distance between the support feet. It is, however, not possible to adjust the distance between the ladder and the wall.

[0009] US 6 405 828 describes a ladder accessory resembling the one described in US 5 850 894, but the joint enabling rotation is situated very close to the support feet.

[0010] US 2 388 892 and CH 241 854 disclose ladder accessories which may be fastened to both stiles of a ladder. The ladder accessories of these documents are disadvantageous in that it is not possible to alter the appearance of the accessory, and hence their use.

[0011] US 2 744 674 discloses a ladder extension adapted for a ladder having a single stile, whereas US 1918 293 discloses a ladder extension resembling the ladder accessories of US 2 388 892 and CH 241 854, however with the difference in intended use; the ladder extension of US 1 918 293 is intended for use with a type of "ladder" comprising stiles only.

[0012] DE 203 10 659 U1 discloses a ladder for use with a vehicle with adaptable setup angle. However, this ladder uses suction cups for stability, which means it can only be used in relation to surfaces to which a suction cup can be fastened.

[0013] EP 0 232 206 discloses a ladder accessory having a lot of beneficial features concerning usability, however with the drawback that it is extremely complicated. The object of the present invention is to provide a ladder accessory that combines many of the features of the ladders described above, which can be used in many different positions, and which is easy to retrofit on existing ladders.

SUMMARY OF THE INVENTION

[0014] The invention solves the above and other problems by providing a ladder accessory comprising a right-hand and a left-hand accessory for a ladder having stiles with a circular cross-section, the ladder accessory comprising a bent component comprising first and second shanks interconnected by a curved portion, and a fastening beam. An outer diameter of the fastening beam is such that it fits within a ladder bar of a ladder. The ladder accessory further comprises a connecting beam connecting either of the shanks of the bent component to the

fastening beam. The connecting beam is fastened to either of the shanks of the bent component such that the connecting beam extends perpendicular from the shank on which it is fastened and in the plane of the bent component, wherein an angle β between the fastening beam and the connecting beam is 90° - 120° , and wherein an angle α between the fastening beam and the shank to which the connecting beam is fastened is 95° - 115° .

[0015] In order to secure the fastening beam to the ladder bar, the fastening beam could be provided with locking means enabling the fastening beam to be fastened to the ladder bar.

[0016] In order to enable several different uses for the ladder accessory according to the present invention, the locking means could allow the fastening beam to be rotated to enable fastening in different positions.

[0017] In one embodiment of the invention, the locking means could comprise holes arranged in the fastening beam. The holes could be adapted to lock the fastening beam by interacting with pins. The pins could be attached to sledges, which are slidably mounted on a top rung of the ladder.

[0018] The fastening means could also comprise a threaded bolt, extending through the centre of the fastening beam and engaging an end piece, provided with a beveled surface, said beveled surface cooperating with a corresponding beveled surface of the fastening beam, such that the fastening beam is fastened by friction as the threaded bolt is tightened.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] Below, the invention will be described with reference to the appended drawings, wherein:

Fig. 1a is a perspective view showing a first embodiment of a left-hand ladder accessory according to the present invention,

Fig. 1b is an end view of the first embodiment of the left-hand ladder accessory of Fig. 1b,

Fig. 1c is a side view of the first embodiment of the ladder accessory of Figs. 1a and 1b,

Fig. 1d is an end view showing a right- and left-hand ladder accessories according to the first embodiment fastened to a top portion of a ladder,

Fig. 1e is a perspective view of a second embodiment of the ladder accessory of Fig. 1,

Fig. 1f is a side view of the second embodiment of the ladder accessory,

Fig. 1g is a front view of the second embodiment of the ladder accessory,

Fig. 1h is a top view of the second embodiment of the ladder accessory,

Fig. 2 is a perspective view showing a first use of right-hand and left-hand ladder accessories according to the first embodiment of the present invention,

Fig. 3 is a perspective view showing a second use of right-hand and left-hand ladder accessories ac-

cording to the first embodiment of the present invention,

Fig. 4 is a perspective view showing a third use of right-hand and left-hand ladder accessories according to the first embodiment of the present invention,

Fig. 5 is a perspective view showing a fourth use of right-hand and left-hand ladder accessories according to the first embodiment of the present invention,

Fig. 6 is a perspective view showing a fifth use of right-hand and left-hand ladder accessories according to the first embodiment of the present invention,

Fig. 7 is a perspective view showing a sixth use of right-hand and left-hand ladder accessories according to the first embodiment of the present invention,

Fig. 8 is a perspective view showing a seventh use of right-hand and left-hand ladder accessories according to the first embodiment of the present invention,

Fig. 9 is a perspective view showing an eighth use of right-hand and left-hand ladder accessories according to the first embodiment of the present invention and

Fig. 10 is a perspective view showing a ninth use of right-hand and left-hand ladder accessories according to the first embodiment of the present invention.

DESCRIPTION OF EMBODIMENTS

[0020] With reference to Figs. 1a, 1b and 1c, a left-hand ladder accessory 100L according to a first embodiment of the present invention comprises a bent portion 110, having first and second shanks 120, 130 interconnected by a curved portion 140. The ends of the bent portion 110 could comprise end caps 150, 150'. On either of the shanks 120, 130, and in the plane of the bent portion 110, a first end 160' of a connecting beam 160 is fastened such that the connecting beam 160 extends perpendicular from the shank on which it is fastened. A second end 160" of the connecting beam 160 is joined to a first end 170' of a fastening beam 170. As can be seen in Fig. 1c, the fastening beam 170 extends in a direction that is slightly offset from a perpendicular direction as compared to the plane of the bent portion 110, i.e. an angle β (shown in Fig. 1c) is slightly more than 90° , e.g. 90° - 120° . The offset from the perpendicular direction should roughly correspond to the angle of inclination of a ladder leaning towards a wall (the ladder being denoted 300 in Figs. 2-11). In Fig. 1b, an angle α , indicating the angle between the fastening beam 170 and the shank 130, is shown. The angle α is preferably somewhat larger than 90° , e.g. 95° - 115° . Moreover, the ladder accessory 100L comprises some kind of fastening means; in the embodiment shown in Figs. 1a, 1b and 1c, the fastening means are holes 180, which are adapted to receive a pin, in a way to be described below with reference to Fig. 1d.

[0021] In Fig. 1d, a set of ladder accessories comprising a right-hand ladder accessory 100R according to the

first embodiment and a left-hand ladder accessory 100L according to the first embodiment is shown mounted on a ladder 300. The only difference between the right-hand and left-hand accessories 100R and 100L, respectively, is that the first end 160' is fastened to the shank 120 on the right-hand ladder accessory and on the shank 130 on the left-hand accessory. The ladder accessories are fastened to ladder bars 310, 320 of the ladder 300, partly by insertion of the fastening beams 170 of the respective ladder accessories 100R and 100L into a top portion of the ladder bars 310, 320, and partly due to interaction between the holes 180 and pins 500, 500' which are mounted on sledges 510, 510', respectively. The sledges are slidably mounted on a top rung 330, which interconnects the two ladder bars 310, 320. The slidability of the sledges allows the interaction between the pins 500, 500' and the holes 180 to be controlled; by moving the sledges away from the fastening beams, i.e. towards one another, the pins 500, 500' are retracted from the holes 180, which interrupts the interconnection between the pins and the holes; in this position, the fastening beams 170 of the ladder accessories 100R and 100L will not be locked by the interaction with the pins 500, 500', and can hence be withdrawn from, or rotated within, the ladder bars 310, 320.

[0022] In Figs. 1e-1h, a second embodiment of a left-hand ladder accessory 100L' is shown. The second embodiment resembles the first embodiment, but the shank 130 is provided with a crossbeam 135, an axis of which extending perpendicular to the axis of the shank 130. The ends of the crossbeam 135 are provided with end caps 150.

[0023] Otherwise, the design of the left-hand ladder accessory 100L' according to the second embodiment is identical with the design of the ladder accessory 100L according to the first embodiment, except for the angle α' of the first embodiment being narrower than an angle α' of the second embodiment. Moreover, the holes 180 of the second embodiment are placed on three levels.

[0024] Moreover, an angle X' is shown in Fig. 1g. This angle refers to the angle between the fastening beam 170 and the shank 120. The angle χ' is of course also present for the first embodiment, and it may be close to 90 degrees.

[0025] There are several holes 180 provided in each fastening beam 170; hence, it is possible to adjust an angle between the connecting beam 160 and the rung 330. This makes it possible to adapt position of the ladder accessory for various uses; those uses are described below with reference to Figs. 2-11.

[0026] Obviously, there are several modifications possible to the design of the ladder accessory of the present invention; one such modification means that only one type of ladder accessory is used; on such a ladder accessory, the first end 160' of the connecting beam 160 could be fastened to the curved portion 140; the connecting beam 160 will still extend in the plane of the curved portion.

[0027] As mentioned, the fastening beam 170 is provided with some kind of locking means that allows the fastening beam 170 to be fastened in the ladder bar 310 or 320 of the ladder 300. Such means could e.g. be the holes 180 provided over a circumference of the fastening beam 170. In another embodiment of the invention, the fastening of the fastening beam to the top ladder bar 310 or 320 might be provided by a threaded bolt (not shown), extending through the centre of the fastening beam 170. The threaded bolt may be threadingly engaged to an end piece (not shown), provided with a beveled surface. In this embodiment of the invention, the second end 170" of the fastening beam is provided with a corresponding beveled surface. This surface may be arranged by the cutting of the fastening beam 170, such that the beveled surface is the cut end of the fastening beam 170. In other embodiments, the beveled surface might be arranged by welding a plate to the cut end. A fastening means according to this embodiment resembles the mechanism used to fasten the steering bar of a bicycle to the front fork. In order to lock the fastening beam according to this embodiment of the invention to either of the ladder bars 310 or 320, the end piece 200, partly threaded onto the threaded bolt, and the end 170" of the fastening beam 170 are inserted into either of the ladder bars 310 or 320. After the insertion, the bolt is rotated such that the threads of the bolt and the end piece interact to pull the end piece and the beveled surface towards one another. The beveled surface of the end piece and the beveled surface will interact such that the end piece will be pressed against an inner surface (not shown) of the ladder bars, and the pressure will provide the locking action.

[0028] Hereinafter, ten uses of a pair of one right-hand ladder accessory 100R and one left-hand ladder accessory 100L will be described with reference to figures 2-11.

[0029] In Fig. 2, a first use of the pair of the right-hand and left-hand ladder accessories 100L and 100R, respectively, is shown. The left-hand ladder accessory 100L is fastened to the left-hand ladder bar 320, and the right-hand ladder accessory 100R is fastened to the right-hand ladder bar 310. The end caps 150, 150' lean against a straight wall. In the first use, the angle between the rung 330 and the connecting beams 160 is about 90 degrees (seen from above); hence, the ladder will be supported a certain distance, equaling at least the length of either of the shanks 120 or 130 plus the length of the connecting beams 160, from the wall. Moreover, the end caps 150, 150' will lean on the wall with a distance from one another that is larger than the distance between the ladder bars 310, 320. The combination of a large distance between the support points, the ladder bars and the wall will provide a large undisturbed working area for a person standing on the ladder. The first use could be valuable e.g. for performing paint jobs on a wall. It may also be possible to use the end caps 150, 150' that do not rest against the wall for hanging e.g. cans containing e.g. paint.

[0030] Fig. 3 shows a second use of a pair of ladder

accessories 100R and 100L. The mounting of the ladder accessories is identical for the second use and the first use, but according to the second use, the ladder accessories are used to provide a steady support for a ladder leaning towards an outer corner of a e.g. a wall. Due to the dimensions of the ladder accessories, all end caps 150, 150' will be in engagement with the walls forming the corner; although this feature is not entirely necessary to achieve a steady support, the more support points, the steadier the ladder will lean towards the corner of the wall.

[0031] Fig. 4 shows a third use of a pair of left-hand and right-hand ladder accessories according to the present invention. In this use, the connecting beams 160 are mounted in-line with the rung 330 of the ladder. This use is adapted for a flat wall, and provides a wide working area for a user; compared to the first use a person working on the ladder will come closer to the wall, and still have a large distance between the support points between the end caps and the wall. The shanks 120, 130 whose corresponding end caps 150, 150' are not in contact with the wall can be used for support for a user and also for hanging working tools.

[0032] Fig. 5 shows a fourth use of the pair of ladder accessories of the present invention. In the fourth use, the angle of the ladder accessories is set to be about in-between the angle used in the first and the third use; by such setting, there will be an as large distance as possible between the end caps 150, 150', and the distance between the wall, which preferably is flat for this use, and the top of the ladder will be roughly half of the distance achieved with the first use.

[0033] In fig. 6, a fifth use of the ladder accessory pair of the present invention is shown. In this use, the connecting beams 160 are angled away from the wall; hence, the ladder will lean on the wall in a way that does not differ from how a ladder without ladder accessories will lean on the wall. The ladder accessories will extend in a direction away from the wall and will serve as a support for a user.

[0034] In Fig. 7, a sixth setting, or use, of the ladder accessory pair suitable for e.g. a telephone post P is shown. According to this use, the ladder accessories are angled such that a narrow angle, e.g. 45 degrees, between the connecting beams 160 and the rung 330 is achieved. Consequently, the shanks 120, 130 of the right-hand and left-hand ladder accessories 100R and 100L will delimit an area roughly corresponding to e.g. a telephone post or the like. The sixth use is extremely beneficial in combination with a telescopic ladder; if a telescopic ladder is used, it is possible to arrange the ladder accessories around the telephone post when the ladder is unextended, and thereafter raise the ladder by using the telescopic function of the ladder.

[0035] The uses one to six have all the same basic setup, namely that the left-hand ladder accessory is fastened to the left-hand ladder bar and the right-hand ladder accessory is fastened to the left-hand ladder bar. Below, three uses, denoted seven to nine, wherein the right-

hand ladder accessory is fastened to the left-hand ladder bar and the left-hand ladder bar is fastened to the right-hand ladder bar will be described. It should be noted that it is not necessary to actually switch the positions of the ladder accessories; it is simply enough to turn the ladder 180 degrees, such that the formerly right-hand ladder bar will end up to the left, and become the new left-hand ladder bar, and vice versa.

[0036] In Fig. 8, a seventh use of the ladder accessories according to the present invention is shown. The angle between the connecting beams 160 and the ladder steps roughly corresponds to the angle used for the sixth setting, i.e. 45 degrees, but, as mentioned, for the seventh use, the ladder accessories are used such that the right-hand ladder accessory 100R is mounted on the left-hand ladder bar 320 and the left-hand ladder accessory 100L is mounted on the right-hand ladder bar 310. The result will be that the ladder accessories will form a support partly encircling the telephone post or the like. The seventh use does not provide an as good support as the sixth use, but is more convenient, since it is possible to retract the ladder accessories from the post without altering the setting of the ladder accessories. Moreover, the sixth use cannot be used if the right-hand ladder accessory 100R and the left-hand ladder accessory 100L are mounted on the same height; if so, the ladder accessories will collide.

[0037] In Fig. 9, an eighth use of the pair of ladder accessories is shown. The eighth use resembles the seventh use, but either of the ladder accessories is angled away from the post to offer a means for e.g. hanging of tools, paint cans or the like.

[0038] In Fig. 10, a ninth use of the pair of ladder accessories is shown. The ninth use makes it possible to lean the ladder provided with the ladder accessories towards an inner corner of the wall. For the ninth use, the ladder accessories are mounted such that the connecting beam 160 extends perpendicular as compared to the ladder steps of the ladder.

[0039] Its preferable, but not necessary for the function of the ladder accessories of the present invention, if the holes 180 of the fastening beam 170 are provided such that the pins 500, 500' are able to extend through the entire width of the fastening connecting beam 160, i.e. such that the pins 500, 500' are aligned to penetrate two holes 180 located on opposite sides of the fastening beam 170.

[0040] As could be understood, there cannot be an infinite number of holes 180, since too many holes would weaken the fastening beam 170. In one embodiment of the invention, the holes 180 are provided in 45-degree intervals, i.e. such that it is possible to fasten the ladder accessory in any 45-degree angle compared to the rung 330. In order not to weaken the fastening beam too much, the holes 180 could be arranged on different levels; in a preferred embodiment, four primary holes, mutually separated by 90 degrees, are provided on a first level, and four secondary holes, also mutually separated by 90 de-

grees, but separated 45 degrees as compared to the primary holes, are provided on a second level.

[0041] Of course, it is also possible to enable 30-degree separation by providing six holes 180 on the first level and six holes on the second level, wherein the holes on the first level are separated by 60 degrees and the holes of the second level are divided by 60 degrees, whereas the division between the holes of the first level and the holes of the second level are divided by 30 degrees.

[0042] In another embodiment of the invention, two or more sets of holes 180 could be provided on different heights; by providing several sets of holes 180, it is possible to fasten the ladder accessories of different heights, which e.g. will facilitate the seventh use as described above.

Claims

1. A set of ladder accessories comprising a right-hand and a left-hand ladder accessory (100R; 100L; 100L', 100R') for a ladder (300) having ladder bars (310, 320) with a circular cross-section, each of the accessories comprising:

- a bent component (110) comprising first (120) and second (130) shanks interconnected by a curved portion (140),
- a fastening beam (170),

wherein an outer diameter of the fastening beam (170) is such that it fits within either of the ladder bars (310, 320) of the ladder (300), **characterised in that** each of the accessories further comprises a connecting beam (160) connecting either of the shanks (120, 130) of the bent component (110) to the fastening beam (170), wherein the connecting beam (160) is fastened to either of the shanks (120, 130) of the bent component (110) such that the connecting beam (160) extends perpendicular from the shank (130) on which it is fastened and in the plane of the bent component (110), wherein an angle β between the fastening beam (170) and the connecting beam (160) is 90°-120°, and wherein an angle α between the fastening beam (170) and the shank (120, 130) to which the connecting beam (160) is fastened is 95°-115°.

2. The set of ladder accessories of claim 1, wherein the fastening beam (170) of each of the accessories is provided with locking means enabling the fastening beam (170) to be fastened inside the ladder bar (310, 320).
3. The set of ladder accessories of claim 2, wherein the locking means allows the fastening beam (170) to be fastened to the ladder bar (310, 320) at different

positions.

4. The set of ladder accessories of claim 2 or 3, wherein the locking means comprises holes (180) arranged in the fastening beam, said holes (180) being adapted to lock the fastening beam (170) by interaction with pins (510, 510').
5. The set of ladder accessories of any of the preceding claims, further comprising a crossbeam (135) connected substantially perpendicular to one shank of the bent component (120, 130) that is not connected to the connecting beam (160).
6. The set of ladder accessories of any of the preceding claims, wherein the curved portion (140) is bent such that an angle (α') between the shanks (120, 130) is 90-120 degrees, especially 110 degrees.

Patentansprüche

1. Satz von Leiterzubehörteilen mit einem rechten und einem linken Leiterzubehörteil (100R; 100L; 100L', 100R') für eine Leiter (300) mit Leiterholmen (310, 320) mit kreisförmigem Querschnitt, wobei jedes der Zubehörteile umfasst:

- eine gebogene Komponente (110) umfassend je einen durch einen gekrümmten Abschnitt (140) miteinander verbundenen ersten (120) und zweiten (130) Schenkel,
- einen Befestigungsbalken (170),

wobei ein Außendurchmesser des Befestigungsbalkens (170) derart ist, dass er in eine der Leiterholme (310, 320) der Leiter (300) passt, **dadurch gekennzeichnet, dass** jedes der Zubehörteile ferner einen Verbindungsbalken (160) aufweist, der einen der Schenkel (120, 130) der gebogenen Komponente (110) mit dem Befestigungsbalken (170) verbindet, wobei der Verbindungsbalken (160) an einem der Schenkel (120, 130) des gebogenen Bauteils (110) derart befestigt ist, dass sich der Verbindungsbalken (160) senkrecht von dem Schenkel (130), an dem er befestigt ist, und in der Ebene des gebogenen Bauteils (110) erstreckt, wobei ein Winkel β zwischen dem Befestigungsbalken (170) und dem Verbindungsbalken (160) 90°-120° beträgt und wobei ein Winkel α zwischen dem Befestigungsbalken (170) und dem Schenkel (120, 130), an dem der Verbindungsbalken (160) befestigt ist, 95°-115° beträgt.

2. Satz von Leiterzubehörteilen nach Anspruch 1, wobei der Befestigungsbalken (170) jedes Zubehörteils mit einem Verriegelungsmittel versehen ist, das es ermöglicht, dass der Befestigungsbalken (170) in dem Leiterholm (310, 320) befestigt wird.

3. Satz von Leiterzubehörteilen nach Anspruch 2, wobei das Verriegelungsmittel es ermöglicht, dass der Befestigungsbalken (170) an der Leiterstange (310, 320) in verschiedenen Positionen befestigt wird.
4. Satz von Leiterzubehörteilen nach Anspruch 2 oder 3, wobei das Verriegelungsmittel in dem Befestigungsbalken angeordnete Löcher (180) umfasst, wobei die Löcher (180) dazu ausgebildet sind, den Befestigungsbalken (170) durch Wechselwirkung mit Stiften (510, 510') zu arretieren.
5. Satz von Leiterzubehörteilen nach einem der vorhergehenden Ansprüche, weiter umfassend einen Querbalken (135) der im Wesentlichen senkrecht an einem Schenkel des gebogenen Bauteils (120, 130) befestigt ist und nicht mit dem Verbindungsbalken (160) verbunden ist.
6. Satz von Leiterzubehörteilen nach einem der vorhergehenden Ansprüche, wobei der gekrümmte Abschnitt (140) so gebogen ist, dass ein Winkel (α') zwischen den Schenkeln (120, 130) 90-120 Grad, insbesondere 110 Grad beträgt.

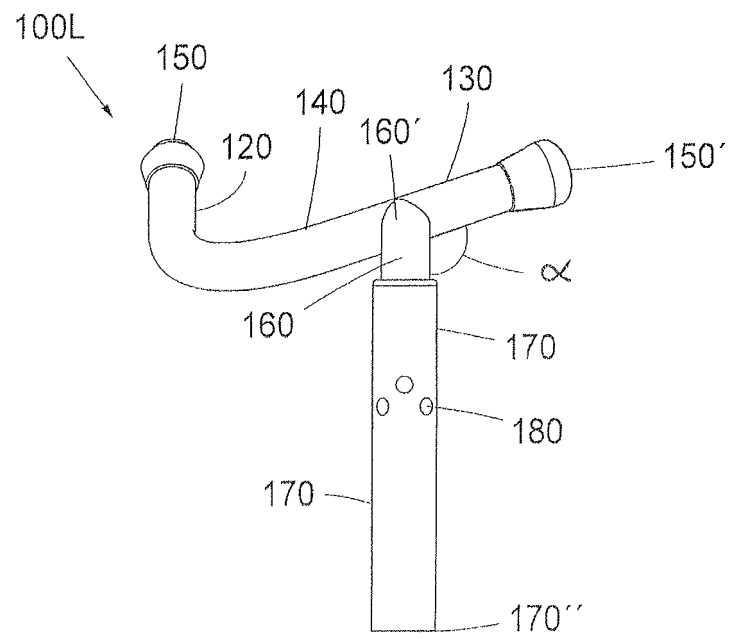
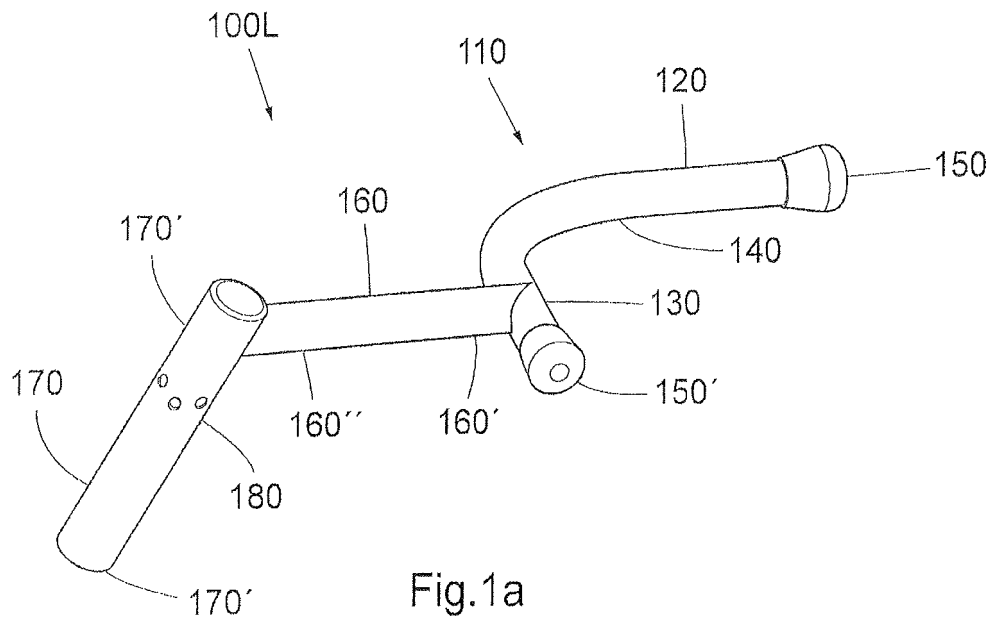
Revendications

1. Ensemble d'accessoires d'échelle, comprenant un accessoire de main droite et un accessoire de main gauche (100R ; 100L ; 100L' ; 100R') d'une échelle (300) comportant des barres (310, 320) d'échelle de section transversale circulaire, chacun des accessoires comprenant:

un composant cintré (110) comprenant des première (120) et seconde (130) tiges liées mutuellement par une partie courbée (140),
 un montant de fixation (170),
 dans lequel un diamètre extérieur du montant de fixation (170) est tel qu'il s'ajuste à l'intérieur de l'une ou de l'autre des barres (310, 320) d'échelle de l'échelle (300), **caractérisé en ce que** chacun des accessoires comprend en outre un montant de liaison (160) de liaison de l'une ou de l'autre des tiges (120, 130) du composant cintré (110) au montant de fixation (170), dans lequel le montant de liaison (160) est fixé à l'une ou à l'autre des tiges (120, 130) du composant cintré (110) de sorte que le montant de liaison (160) s'étend perpendiculairement à la tige (130) à laquelle il est fixé et dans le plan du composant cintré (110), dans lequel un angle entre le montant de fixation (170) et le montant de liaison (160) s'inscrit dans une plage de 90° à 120°, et dans lequel un angle α entre le montant de fixation (170) et la tige (120, 130) à laquelle est fixé le montant de liaison (160) s'inscrit dans

une plage de 95° à 115°.

2. Ensemble d'accessoires d'échelle selon la revendication 1, dans lequel le montant de fixation (170) de chacun des accessoires est pourvu d'un moyen de verrouillage permettant une fixation du montant de fixation (170) à l'intérieur de la barre (310, 320) d'échelle.
3. Ensemble d'accessoires d'échelle selon la revendication 2, dans lequel le moyen de verrouillage permet une fixation du montant de fixation (170) à la barre (310, 320) d'échelle à des positions différentes.
4. Ensemble d'accessoires d'échelle selon la revendication 2 ou 3, dans lequel le moyen de verrouillage comprend des trous (180) ménagés dans le montant de fixation, lesdits trous (180) étant conçus pour le verrouillage du montant de fixation (170) par une interaction avec des broches (510, 510').
5. Ensemble d'accessoires d'échelle selon l'une quelconque des revendications précédentes, comprenant en outre une barre transversale (135) liée sensiblement perpendiculairement à une tige du composant cintré (120, 130) qui n'est pas liée au montant de liaison (160).
6. Ensemble d'accessoires d'échelle selon l'une quelconque des revendications précédentes, dans lequel la partie courbée (140) est cintrée de façon à former un angle (α') entre les tiges (120, 130) s'inscrivant dans une plage de 90 à 120 degrés, plus particulièrement de façon à former un angle de 110 degrés.



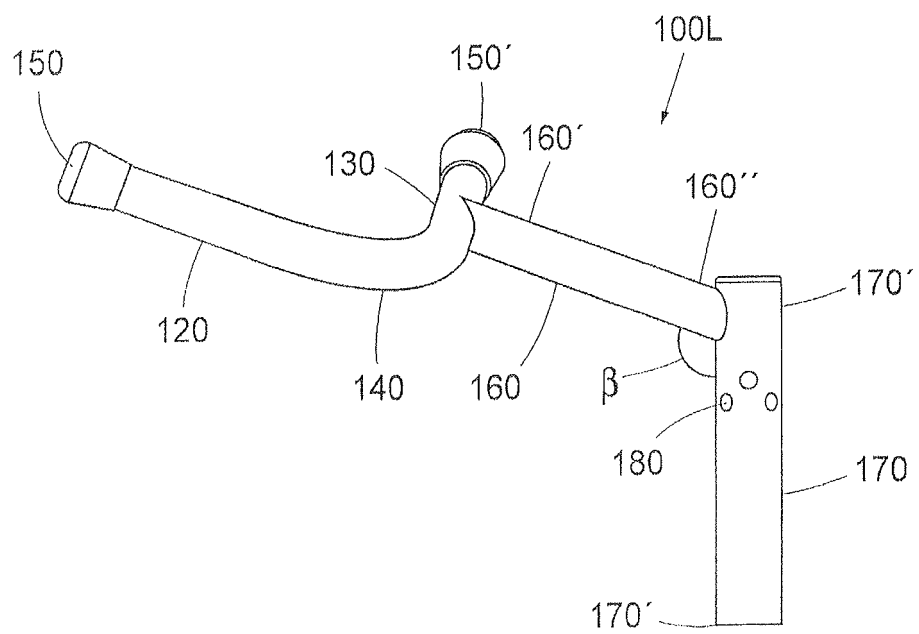


Fig.1C

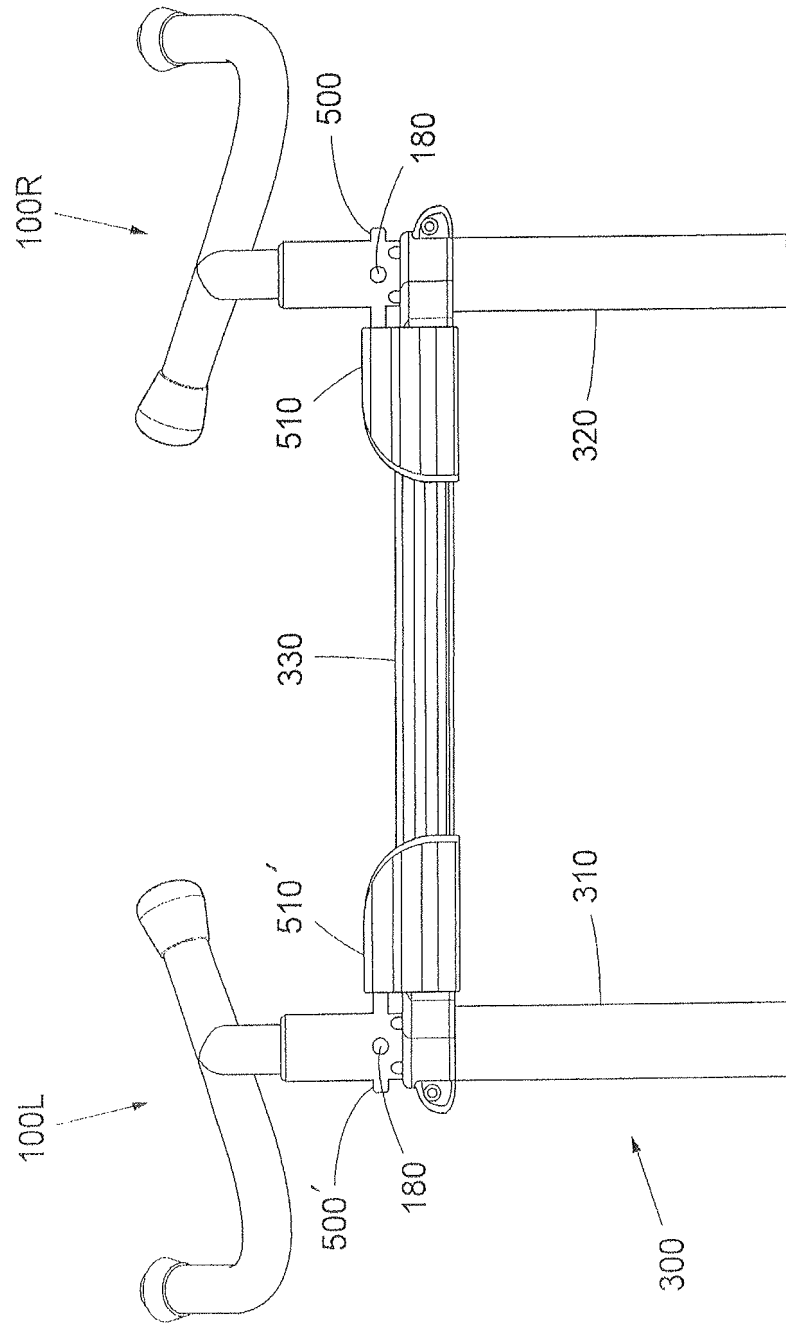
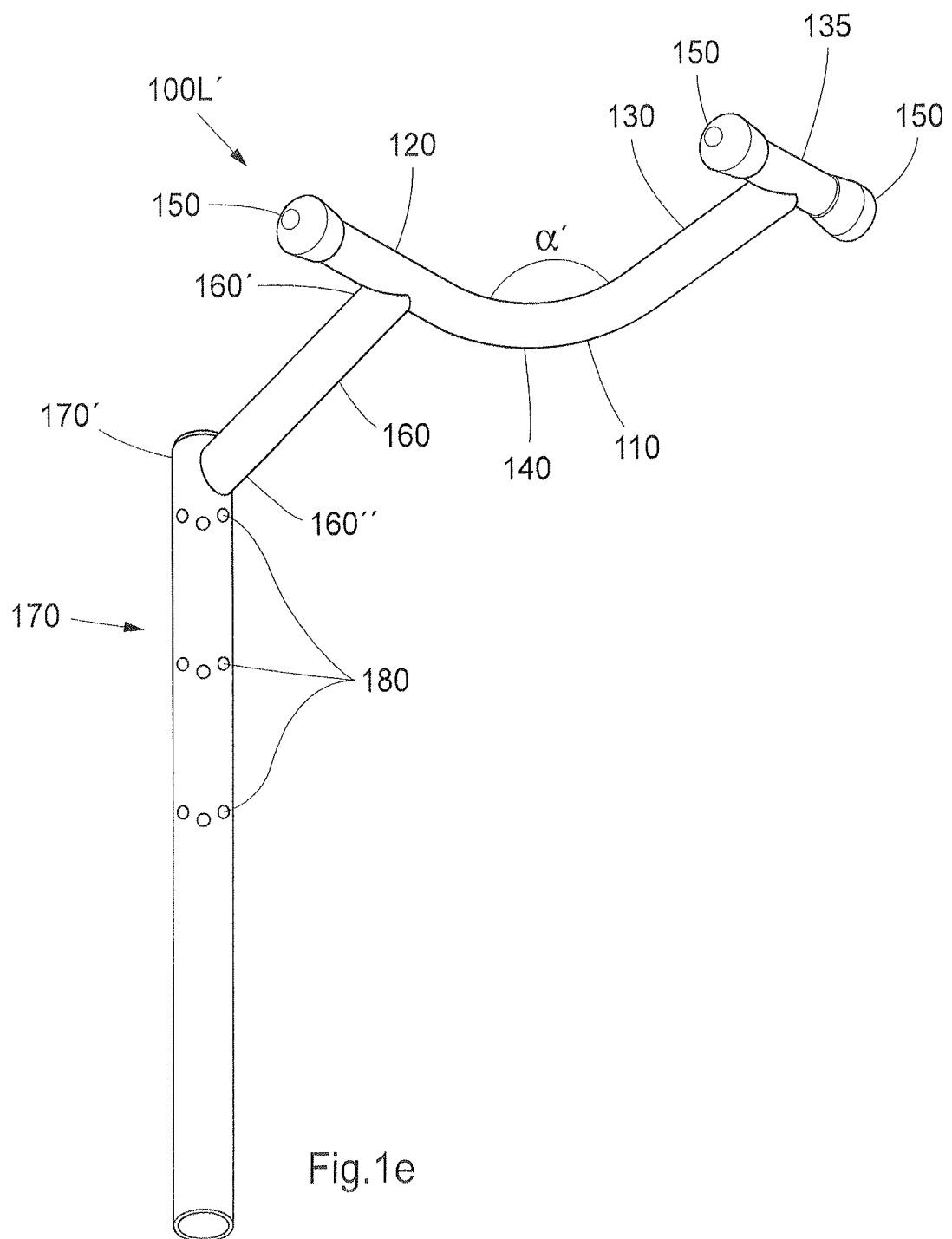


Fig. 1d



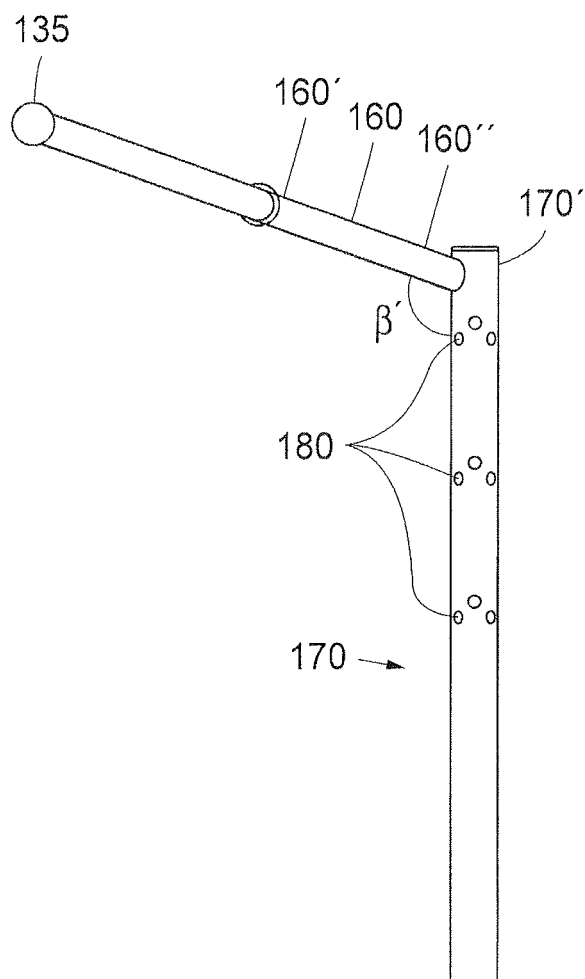


Fig.1f

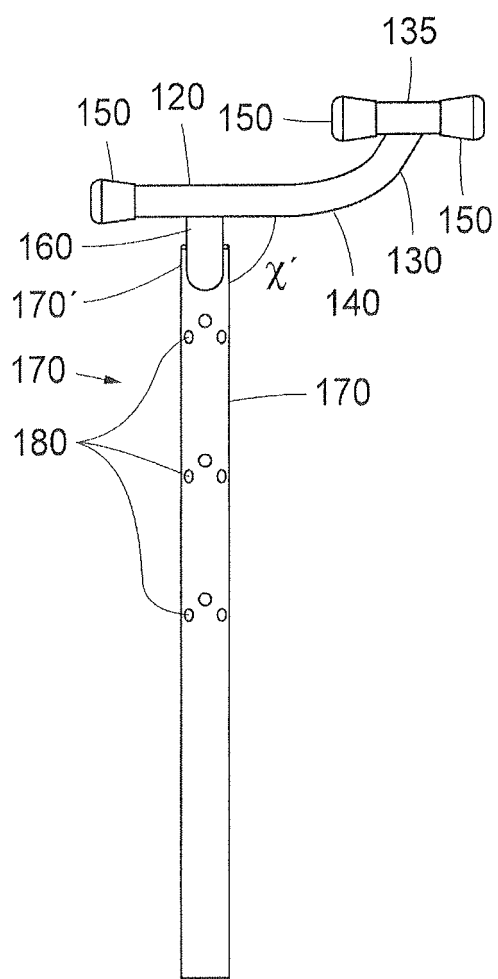


Fig.1g

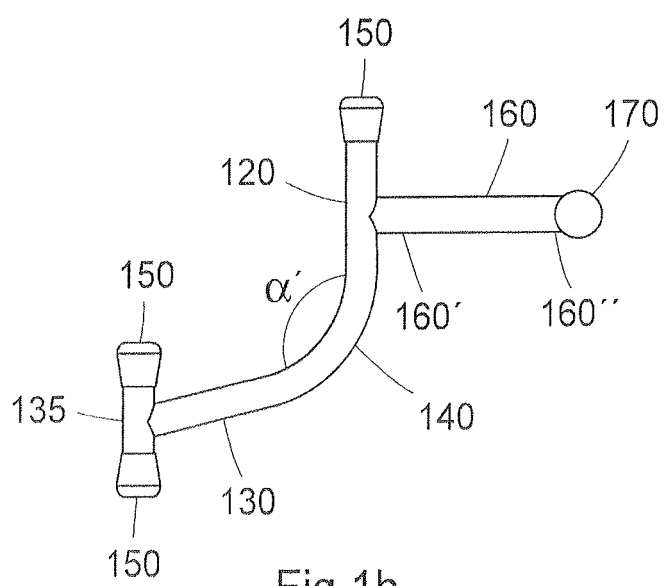
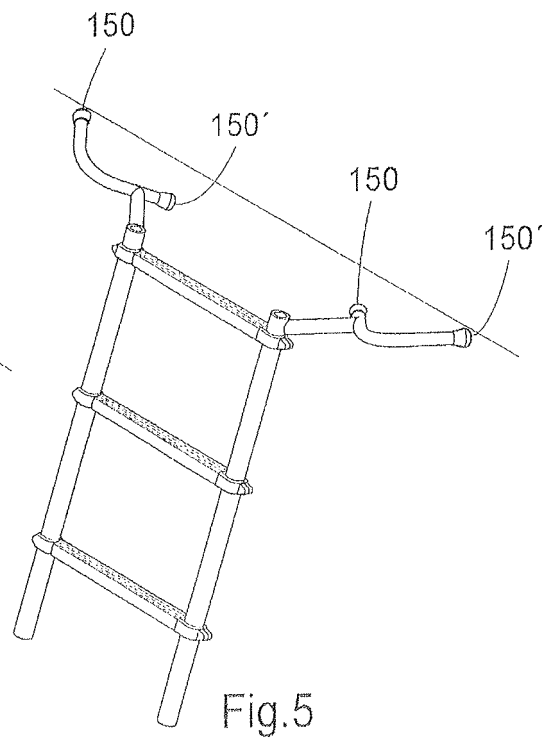
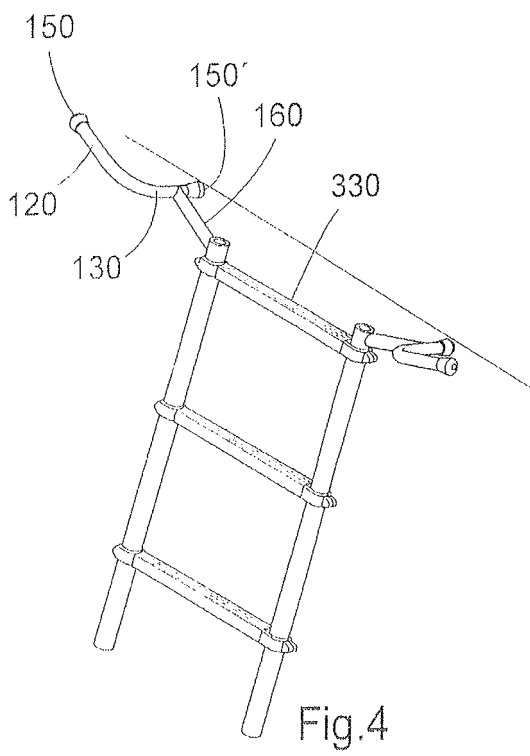
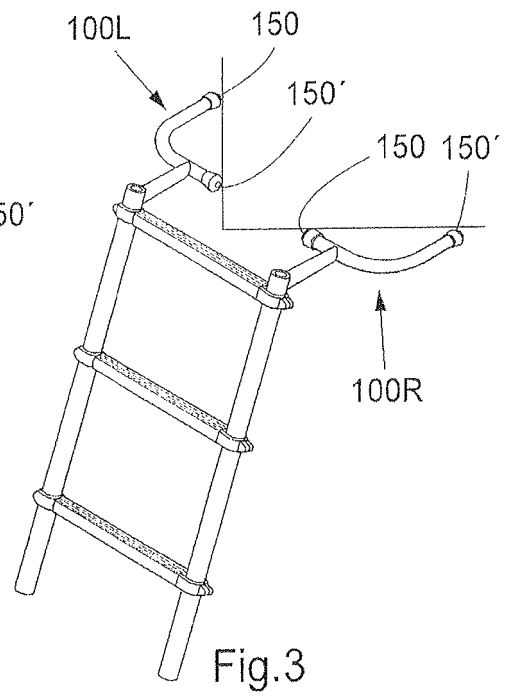
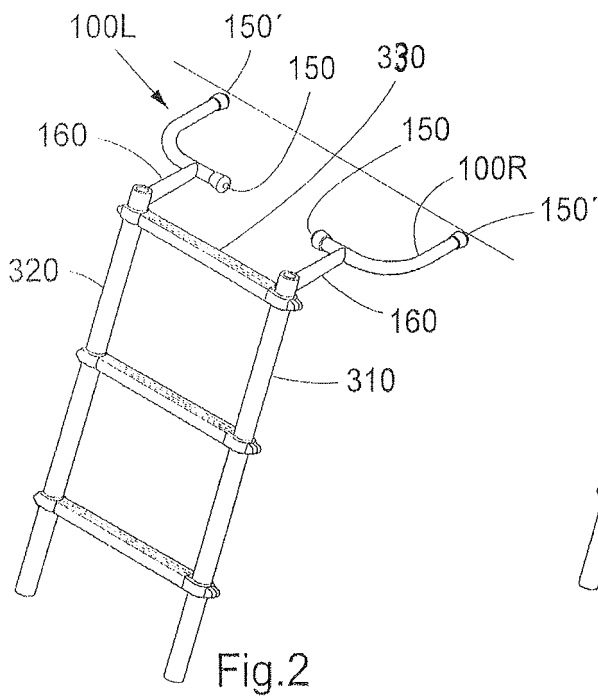
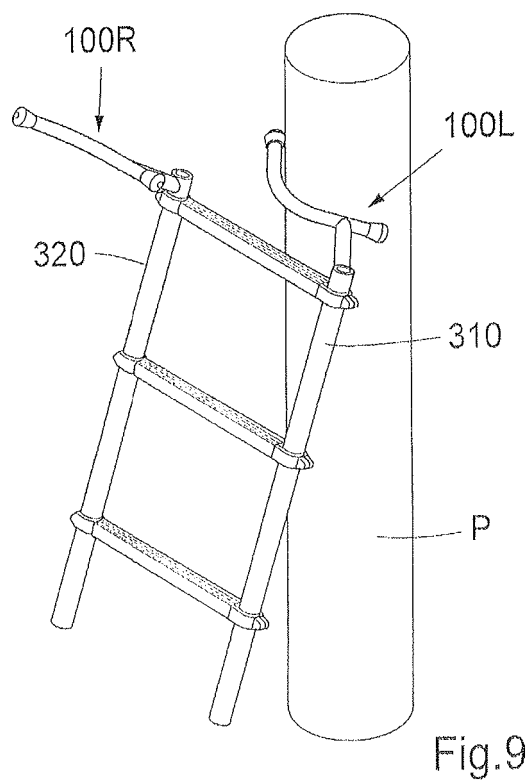
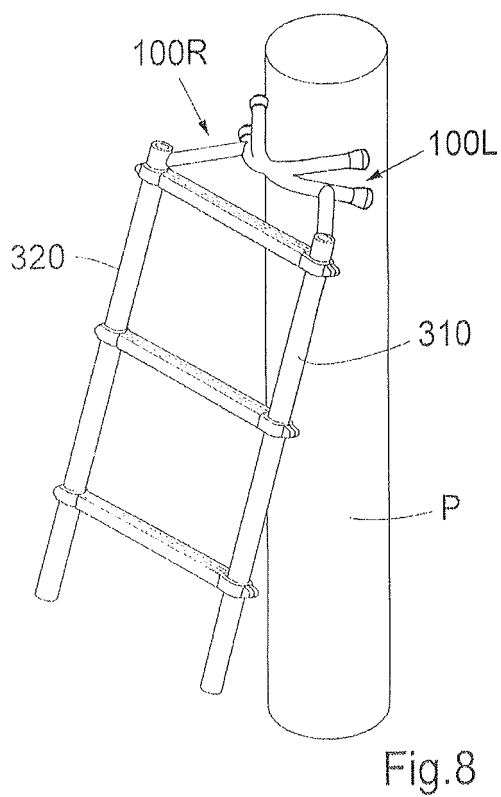
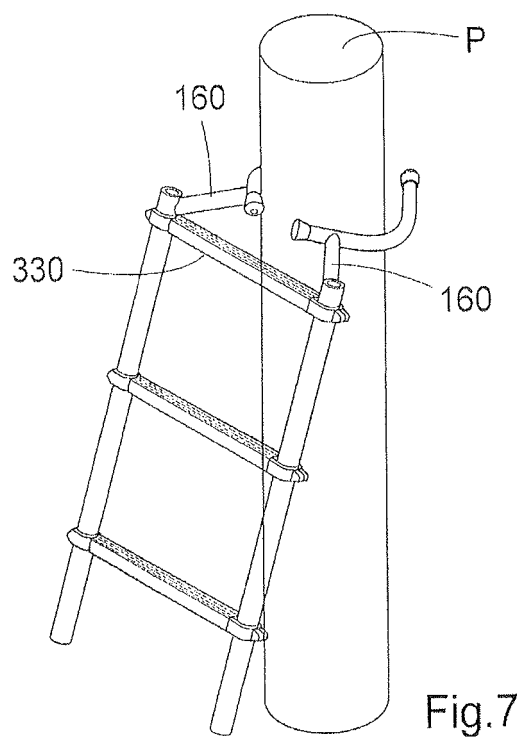
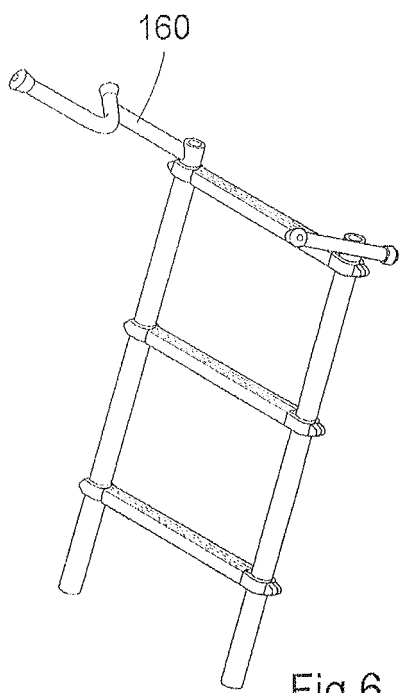


Fig. 1h





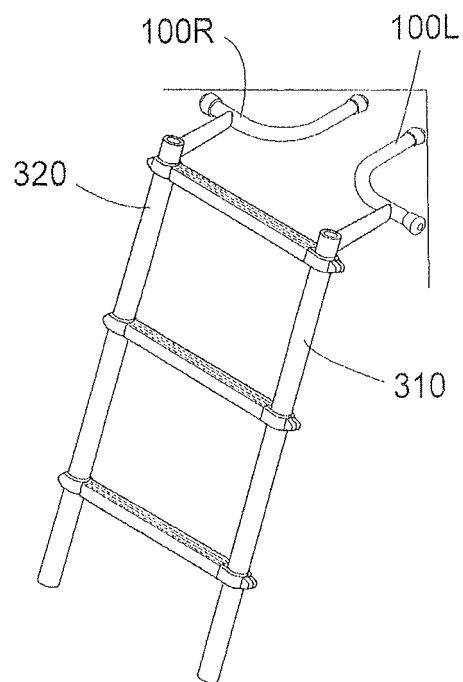


Fig.10

REFERENCES CITED IN THE DESCRIPTION

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