

(19)



(11)

EP 1 447 520 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention of the grant of the patent:
16.07.2008 Bulletin 2008/29

(51) Int Cl.:
E06C 7/48 (2006.01) **E06C 1/12** (2006.01)
E06C 7/42 (2006.01) **E06C 1/10** (2006.01)
E06C 7/14 (2006.01)

(21) Application number: **04100469.8**

(22) Date of filing: **09.02.2004**

(54) **Ladder Accessory**

Leiterzusatzteil

Accessoire d'échelle

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PT RO SE SI SK TR

(30) Priority: **11.02.2003 GB 0303010**
27.02.2003 GB 0304461

(43) Date of publication of application:
18.08.2004 Bulletin 2004/34

(73) Proprietors:

- **Weston, James Thomas**
Brentwood,
Essex CM13 1PU (GB)
- **Weston, Richard**
Rainham,
Essex RM13 8LX (GB)

(72) Inventors:

- **Weston, James Thomas**
Brentwood,
Essex CM13 1PU (GB)
- **Weston, Richard**
Rainham,
Essex RM13 8LX (GB)

(74) Representative: **Messulam, Alec Moses et al**
A. Messulam & Co. Ltd.
43-45 High Road
Bushey Heath
Bushey
Herts WD23 1EE (GB)

(56) References cited:
WO-A-91/15651 **GB-A- 845 949**
GB-A- 2 127 084 **US-A- 5 503 245**
US-A- 5 645 140

EP 1 447 520 B1

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

[0001] The present invention relates to a ladder and is particularly though not exclusively applicable to a telescopically collapsible ladder.

[0002] There is known from EP 0 527 766 a telescopically collapsible ladder which will herein be referred to as the Telesteps ladder. This collapsible ladder comprises two stiles formed of telescopically collapsible sections, the lower end of each section fitting within the next lower section. Rungs are mounted each between two sections of the respective stiles, and latch mechanisms located in the rungs automatically lock the sections of the stiles relative to one another when the sections are extended. The latch mechanisms in each rung are arranged to release the sections of the stiles connected to the next higher rung when the rung is collapsed against the next lower rung. Because of this construction, when the lowermost rung is collapsed, it causes the entire ladder to collapse one section at a time.

[0003] It is of course desirable for the ladder to be as long as possible but because the diameter of the sections gets progressively smaller there is a practical limit to the height that such a ladder can reach.

[0004] The closest prior art to the present invention is believed to be US Patent No. 2,881,028 which discloses an attachment that is secured to the top of a ladder to provide a scaffold-like support platform on which a workman can stand.

[0005] The present invention seeks to provide a ladder with an accessory that enables a person standing on one of the rungs of the ladder to reach higher without impairing the safety of the ladder.

[0006] According to the present invention, there is provided a ladder in combination with an accessory which comprises a pair of telescopically collapsible extension stiles connected as extensions of the stiles of the ladder, a stand-off frame secured to the lower end of the extension stiles for distancing the top of the ladder from a wall against which the ladder is leaned and at least one rail extending between the extension stiles.

[0007] The stand-off frame is preferably pivotable relative to the extension stiles so that it may be folded to lie parallel to the plane of the extension stiles for convenient storage.

[0008] It is possible to form the accessory in the same manner as a ladder with rails instead of rungs connected between respect pairs of sections of the collapsible stiles. The rails need not and preferably should not be strong enough to support the weight of a person as they should not be stood upon. However, the rails may be formed as shelves to support tools.

[0009] A self-supporting collapsible ladder somewhat similar to the ladder accessory of the preferred embodiment of the invention is described in US 5,645,140. This ladder, unlike the ladder of the invention, is not designed to be leaned on a wall but instead its equivalent of a stand-off frame is intended to act as a base that rests on

the ground and supports the entire weight of the ladder. The stiles of the ladder are thus designed to rest on the ground and cannot be fitted as an extension of the stiles of another ladder. Furthermore, unlike the accessory of the invention, the ladder has strong rungs intended to support the weight of a person whereas in the preferred embodiment of the invention the rails of the accessory are not meant to be stood upon, only to support tools.

[0010] Advantageously, the rails have holes for receiving and locating tools. If aligned holes are formed in several rails, then they can be used to hold tools even when the accessory is not fully extended.

[0011] To improve the stability of the ladder, the stand-off frame may be provided with retractable lateral extensions to contact the wall at locations further apart than the width of the ladder. Such lateral extensions may suitably be resiliently biased apart into their extended positions and held in their retracted position by means of pins that are automatically released when the stand off frame is pivoted to its horizontal position.

[0012] The invention will now be described further, by way of example, with reference to the accompanying drawings, in which :-

Figure 1 is a perspective view of an accessory of a ladder of the invention shown in its extended condition,

Figure 2 is a side view of the accessory in its fully collapsed condition,

Figure 3 shows the accessory of Figures 1 and 2 being fitted to a Telesteps ladder,

Figure 4 shows the accessory of Figures 1 and 2 being fitted to a conventional ladder using a pair of adapters,

Figures 5, 6 and 7 are side views of the accessory at different stages during its deployment,

Figure 8 is a perspective view of a known Telesteps telescopically collapsible ladder showing the bolt mechanism used to lock the sections of the stiles to one another and to release them automatically as the ladder is collapsed,

Figure 9 is an exploded perspective view of a retractable lateral extension, and

Figure 10 shows to an enlarged scale a detail of the retractable lateral extension that is encircled by a dashed line in Figure 9.

[0013] A ladder accessory 10 comprises two telescopically collapsible stiles 12 and 14. Rails extend between the sections of the stiles, the top rail 18 being designed as a handrail and the remaining rails 16 being formed as shelves that are not strong enough to support the weight of a person. The lower rails 16 are instead contoured to enable tools to be placed on them without risk of sliding off. The lower rails are also provided with holes 19 for receiving tools such as screwdrivers and the holes 19 in the different rails are in alignment so that they can be used to hold tools even when the accessory 10 is not

fully extended, as shown in Figure 2.

[0014] A stand-off frame 20 is secured to the two lowermost sections of the stiles 12 and 14. The frame 20 is pivotable relative to the stiles about a pivot 22 between a storage position, shown in Figure 2, and an operating position, shown in Figure 1.

[0015] The manner in which the accessory 10 is used is best shown in Figures 3 and 4. The stiles 12 and 14 are intended to act as extensions of the stiles of the ladder. Figure 3 shows that the accessory can be fitted to a Telesteps ladder 30 that is itself telescopically collapsible by plugging the lower ends of the stiles 12 and 14 directly into the top sections of the stiles of the ladder 30. A Telesteps ladder, as shown in Figure 8, has retractable pins 40 in its rungs 42 that are biased by springs 44 in a direction to lock the sections of the stiles to one another in their extended position. When the ladder is collapsed, the pins of the lowermost rung are manually retracted and thereafter as each rung comes to rest on the rung below it, two levers 46 are pushed up into the rung and retract its locking pins to release the next sections of the stiles. The ladder therefore collapses automatically under its own weight.

[0016] The fact that the stile sections have to fit inside one another places a limit on the maximum extended length of a telescopically collapsible ladder. However, even though it is required that all the rungs should have sufficient strength to support the weight of a person, the upper rungs cannot be used because the person would be too close to the wall on which the ladder is leaning and because there would be no handrail to grip for safety. The preferred embodiment of the invention enables the higher rungs of the ladder to be used because its stand-off frame distances the top of the ladder from the wall and because it provides both a handrail and secure support surfaces for tools. The accessory does not however act as an extension of the ladder as its rails or shelves are not designed to support the weight of a person.

[0017] While the accessory is designed for use with a Telesteps ladder 30, it can be used with a conventional ladder as shown at 50 in Figure 4. To couple the lower end of the stiles to the stiles of the ladder 50, adapters 52 may be used, which are dimensioned to fit over the ends of the stiles of the ladder 50 and fit into (or to receive) the lower end of the stiles of the accessory 10.

[0018] In its operating position, the stand-off frame 20 is designed to extend at right angles to the stiles and it is held in that position by a pair of articulated arms 60. Because the frame 20 is perpendicular to the stiles 12 and 14, the arms 60 are in tension while the ladder is in used and there is no tendency for the arms to fold into their storage position.

[0019] The lateral ends of the stand-off frame 20 are provided with retractable extensions 62. The extensions 62 are urged into their extended position by springs 84 (see Figures 9 and 10) so that in use they project sideways to span a width greater than the width of the ladder. In this way, the extensions 62 act to steady the ladder

and avoid any tendency for it to twist about its own longitudinal axis when it is in use.

[0020] As shown in Figures 5, 6 and 7, pins 64 are provided to hold the retractable extensions 62 in their retracted position when the accessory is folded for storage. The pins 64 are urged by means of springs 66 in a direction to engage holes 86 (see Figure 9) in the extensions 62 to lock the extensions in their retracted positions. The pins 64 are attached to cords 68 which are wrapped around the pivots 70 that connect the articulated arms 60 to the stand-off frame 20. When the frame reaches its position shown in Figure 7, the pins 64 are disengaged by the cords 68 from the holes in the extensions 62 so that the extensions are automatically deployed when the stand-off frame 20 is pivoted into its position perpendicular to the stiles of the ladder. After the frame as been rotated into its storage position shown in Figure 5, the extensions can be retracted manually and will be retained in this position by the pins 64.

[0021] The manner in which the retractable extension 62 is retained in the frame 20 will now be described by reference to Figures 9 and 10.

[0022] The lateral extension 62 is formed of a tube having a longitudinally extending recess 72 in its surface and three holes 74, 76 and 86 all lying on the same line as the recess 72. The hole 86, as earlier described, receives the pin 64 that holds the extension 62 in its retracted position. The other two holes 74 and 76 serve to locate a bar 78, the axial end of which abuts the pin 64 when the extension 62 is in its extended position to prevent the extension 62 from coming away entirely. The bar 78 has two projecting prongs 80 and 82 that are received in the holes 76 and 74, respectively, to prevent the bar 78 from sliding along the recess 72. The prong 80 is as long as the diameter of the extension 62 so that it may also act as an abutment for the spring 84 that biases the extension 62 into its extended position.

[0023] When the ladder is erected, it is possible for the hand rail 18 to be spaced from the wall but it is preferred that it should rest against the wall without taking the weight of the ladder. To this end, as the ladder is being erected, the hand rail may be positioned to rest on the wall with the stand-off frame 20 slightly spaced from the wall. When a person then stands on the ladder, the frame 20 comes into contact with the wall as the stiles of the ladder bend under the weight of the person. Thereafter the weight of the person is supported by the stand-off frame 20 but because contact is made with the wall at several places, the stability of the ladder is significantly improved. In the unlikely event of the frame 20 giving way for any reason, the ladder will not collapse or move significantly, permitting the person standing on it to descend safely.

[0024] The sections of the ladder accessory are preferably prevented from collapsing when in use by means of locking mechanisms constructed in the same manner as the locking mechanisms of the Telesteps ladder described above. This is desirable from the point of view of

reducing manufacturing cost and ease of use. However, because the accessory is itself relatively small and has few sections, it is not essential for it to collapse from the bottom upwards nor for its locking mechanism to be arranged on the underside of its rails to cause automatic release of the locking mechanisms as the rails come into contact with each other.

Claims

1. A ladder in combination with an accessory which comprises a pair of telescopically collapsible extension stiles (12,14) connected as extensions of the stiles of the ladder (30;50), a stand-off frame (20) secured to the lower end of the extension stiles (12,14) for distancing the top of the ladder from a wall against which the ladder is leaned and at least one rail (18) extending between the extension stiles.
2. A ladder and accessory combination as claimed in claim 1, wherein the stand-off frame (20) is pivotable relative to the extension stiles (12,14) so as to lie parallel or perpendicular to the plane of the extension stiles (12,14).
3. A ladder and accessory combination as claimed in claim 1 or 2, comprising a plurality of rails (16,18) to extend parallel to the rungs of the ladder (30;50) and each connected between a respect pair of sections of the collapsible stiles (12,14).
4. A ladder and accessory combination as claimed in claim 3, wherein the rails (16) are formed as shelves to support tools.
5. A ladder and accessory combination as claimed in claim 3 or 4, wherein the rails (16) have holes (19) for receiving and locating tools.
6. A ladder and accessory combination as claimed in claim 5, wherein holes (19) are formed in several rails (16), the holes (19) in the different rails (16) being aligned.
7. A ladder and accessory combination as claimed in any preceding claim, wherein the standoff frame (20) is provided with retractable lateral extensions (62) to contact the wall at locations further apart than the width of the ladder.
8. A ladder and accessory combination as claimed in claim 7, wherein the lateral extensions (62) are resiliently biased apart into their extended positions and are held in their retracted position by means of pins (64) that are automatically released when the stand off frame (20) is pivoted to its horizontal position.

9. A ladder and accessory combination as claimed in any preceding claim, wherein locking mechanism are provided in the rails of the extension to lock the sections of the stiles to one another in their extended position.

10. A ladder and accessory combination as claimed in claim 9, wherein the locking mechanism are designed such that as each rail is collapsed down onto the next lower rail, the locking mechanisms for the stile sections connected to the next higher rail are automatically released.

Patentansprüche

1. Leiter in Kombination mit einem Zubehörteil, welche zwei teleskopisch einschiebbare Verlängerungsholme (12, 14) aufweist, die als Verlängerungen der Leiterholme (30; 50) mit diesen verbunden sind, einen Abstandsrahmen (20), welcher am unteren Ende der Verlängerungsholme (12, 14) befestigt ist, um das Oberteil der Leiter von einer Wand zu beabstanden, an welche die Leiter angelehnt ist, und wenigstens eine Querschiene (18), die sich zwischen den Verlängerungsholmen erstreckt.
2. Kombination aus Leiter und Zubehörteil nach Anspruch 1, worin der Abstandsrahmen (20) klappbar gegenüber den Verlängerungsholmen (12, 14) ist, so daß er parallel oder senkrecht zur Ebene der Verlängerungsholme (12, 14) liegen kann.
3. Kombination aus Leiter und Zubehörteil nach Anspruch 1 oder Anspruch 2, mit mehreren Querschienen (16, 18), die sich parallel zu den Sprossen (30; 50) der Leiter erstrecken und jeweils zwischen einem entsprechenden Paar von Abschnitten der teleskopisch zusammenschiebbaren Holme (12, 14) mit diesen verbunden sind.
4. Kombination aus Leiter und Zubehörteil nach Anspruch 3, worin die Querschienen (16) als Ablage zur Aufnahme von Werkzeugen ausgebildet sind.
5. Kombination aus Leiter und Zubehörteil nach Anspruch 3 oder 4, worin die Querschienen (16) Löcher (19) zur Aufnahme und Positionierung von Werkzeugen aufweisen.
6. Kombination aus Leiter und Zubehörteil nach Anspruch 5, worin Löcher (19) in mehreren Querschienen (16) ausgebildet sind, wobei die Löcher (19) in den verschiedenen Schienen (16) miteinander fluchten.
7. Kombination aus Leiter und Zubehörteil nach einem beliebigen der vorangehenden Ansprüche, worin der

Abstandsrahmen (20) mit einziehbaren seitlichen Verlängerungen versehen ist, welche an weiter auseinander liegenden Stellen an der Wand zu Anlage kommen, als die Breite der Leiter erlaubt.

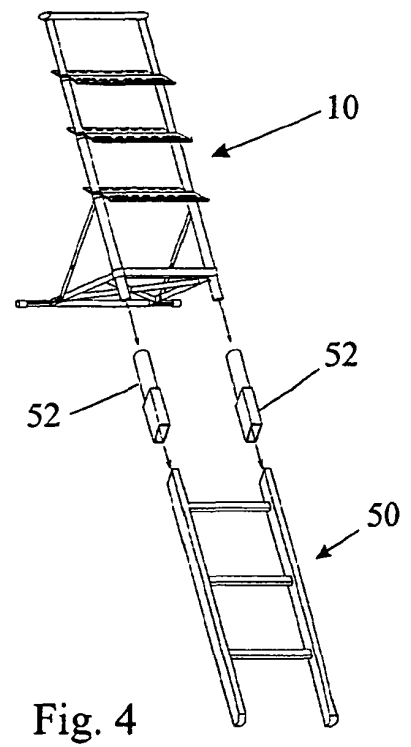
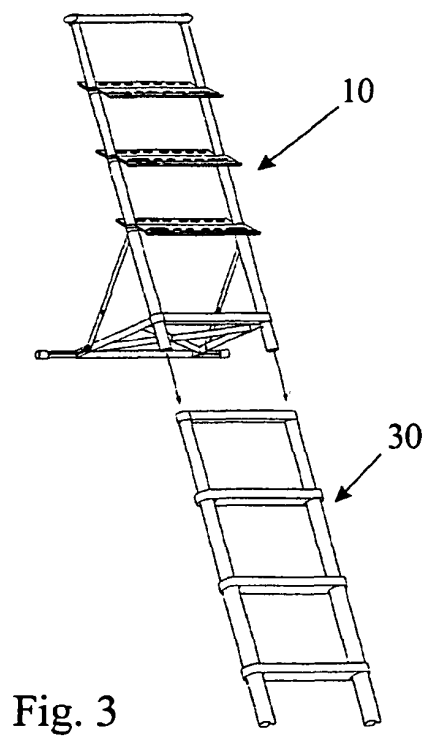
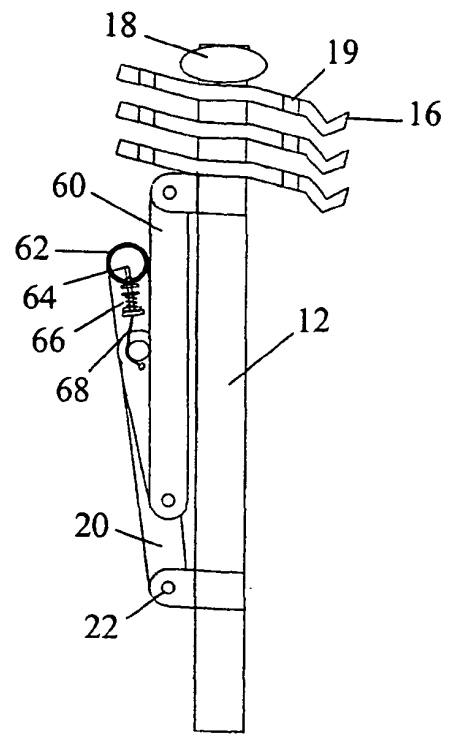
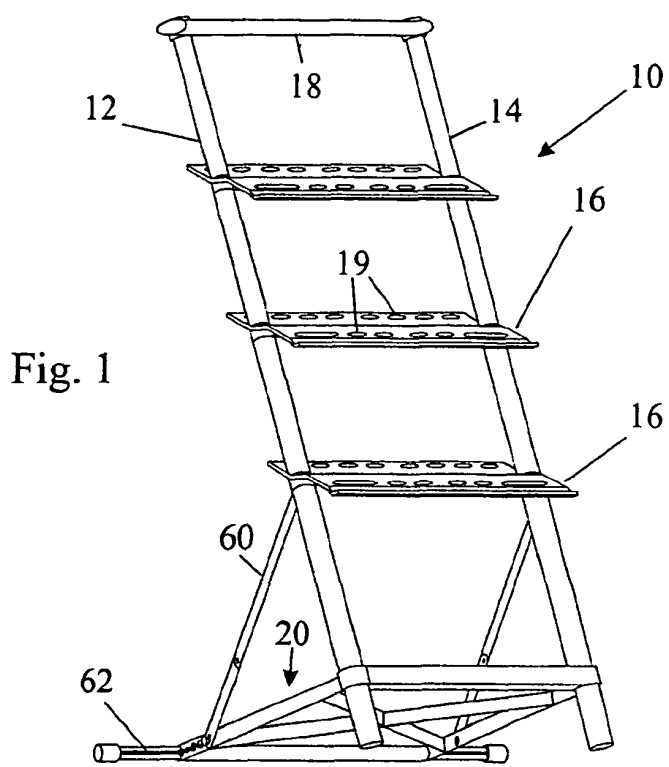
8. Kombination aus Leiter und Zubehörteil nach Anspruch 7, worin die seitlichen Verlängerungen (62) federnd auseinander in ihre ausgefahrenen Stellungen gedrückt werden und mittels Stiften (64) in ihrer eingefahrenen Stellung gehalten werden, welche automatisch freigegeben werden, wenn der Abstandsrahmen (20) in seine horizontale Lage geklappt wird. 5
9. Kombination aus Leiter und Zubehörteil nach einem beliebigen der vorangehenden Ansprüche, worin Verriegelungsmechanismen in den Schienen der Verlängerung vorgesehen sind, um die Abschnitte der Holme in ihrer ausgezogenen Stellung gegeneinander zu verriegeln. 10
10. Kombination aus Leiter und Zubehörteil nach Anspruch 9, worin die Verriegelungsmechanismen so ausgebildet sind, daß jede Schiene auf die nächsttiefere Schiene abgesenkt wird, wobei die Verriegelungsmechanismen der mit der nächsthöheren Schiene verbundenen Holmabschnitte automatisch gelöst werden. 15

Revendications

1. Échelle en combinaison avec un accessoire qui comprend une paire de montants d'extension se pliant ou s'escamotant de façon télescopique (12, 14), qui sont connectés en tant qu'extensions des montants de l'échelle (30 ; 50), une structure d'entretoise (20) attachée à l'extrémité inférieure des montants d'extension (12, 14) pour distancer ou espacer le sommet de l'échelle d'un mur contre lequel l'échelle est adossée et au moins un rail (18) qui s'étend entre les montants d'extension. 20
2. Combinaison d'échelle et d'accessoire selon la revendication 1, dans laquelle la structure d'entretoise (20) est pivotante par rapport aux montants d'extension (12, 14), de sorte qu'elle repose de façon parallèle ou perpendiculaire au plan des montants d'extension (12, 14). 25
3. Combinaison d'échelle et d'accessoire selon la revendication 1 ou 2, comprenant une pluralité de rails (16, 18) destinés à s'étendre de façon parallèle au barreaux de l'échelle (30 ; 50), chacun étant connecté entre une paire respective de sections des montants pliants (12, 14). 30
4. Combinaison d'échelle et d'accessoire selon la re- 35

vendication 3, dans laquelle les rails (16) sont formés comme des tablettes pour maintenir des outils.

5. Combinaison d'échelle et d'accessoire selon la revendication 3 ou 4, dans laquelle dans laquelle les rails (16) possèdent des orifices (19) pour accommoder et disposer des outils. 40
6. Combinaison d'échelle et d'accessoire selon la revendication 5, dans laquelle les orifices (19) sont formés dans plusieurs rails (16), les orifices (19) dans les différents rails (16) étant alignés. 45
7. Combinaison d'échelle et d'accessoire selon l'une des revendications précédentes, dans laquelle la structure d'entretoise (20) est dotée d'extensions latérales parallèles (62) pour contacter avec la paroi au niveau d'endroits plus distants que la largeur de l'échelle. 50
8. Combinaison d'échelle et d'accessoire selon la revendication 7, dans laquelle les extensions latérales parallèles (62) sont élastiquement rappelées à l'écart l'une de l'autre et vers leur position étendue, et sont maintenues dans leur position rétractée au moyen de goupilles (64) qui sont automatiquement libérées lorsque la structure d'entretoise (20) pivote par rapport à sa position horizontale. 55
9. Combinaison d'échelle et d'accessoire selon l'une des revendications précédentes, dans laquelle des mécanismes de verrouillage sont fournis dans les rails de l'extension pour verrouiller les sections des montants l'une à l'autre dans leur position étendue. 60
10. Combinaison d'échelle et d'accessoire selon la revendication 9, dans laquelle les mécanismes de verrouillage sont conçus de telle sorte que, au fur et à mesure du pliage descendant de chaque rail sur le prochain rail inférieur, les mécanismes de verrouillage pour les sections de montants connectées au prochain rail supérieur soient automatiquement libérés. 65



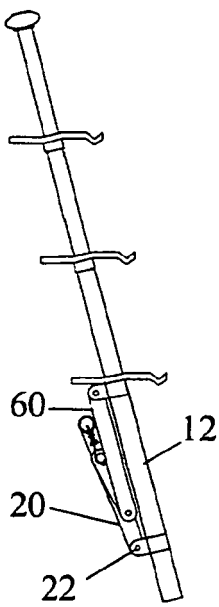


Fig. 5

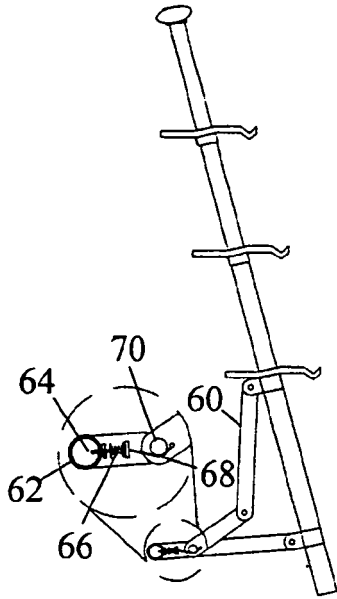


Fig. 6

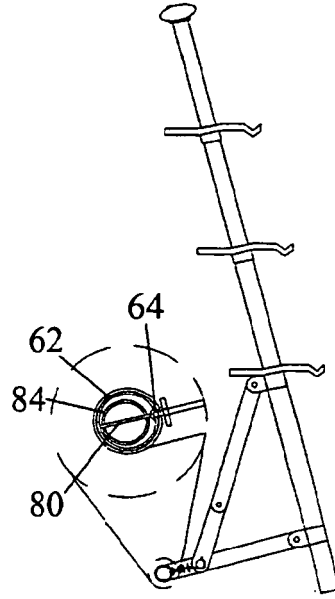


Fig. 7

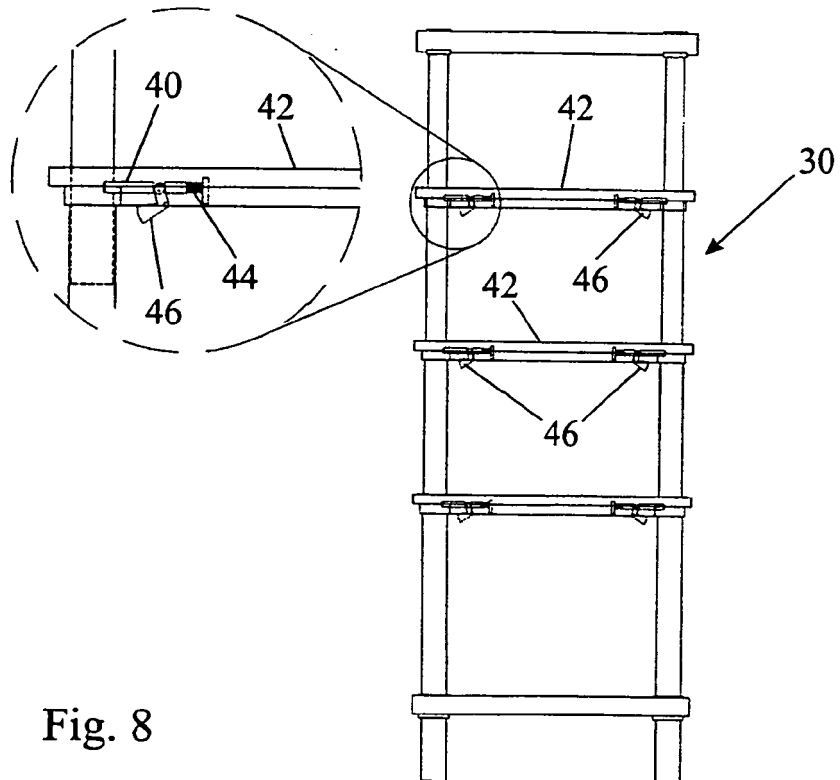


Fig. 8

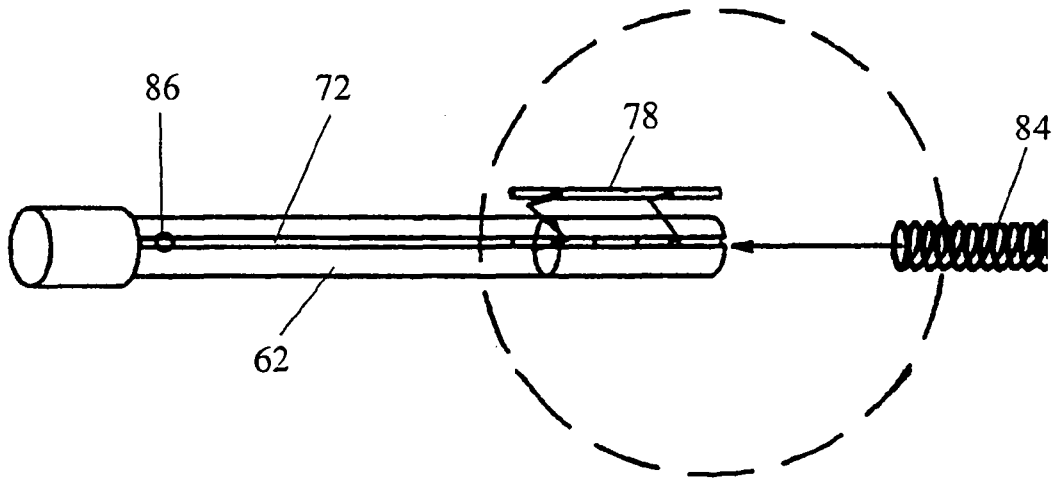


Fig. 9

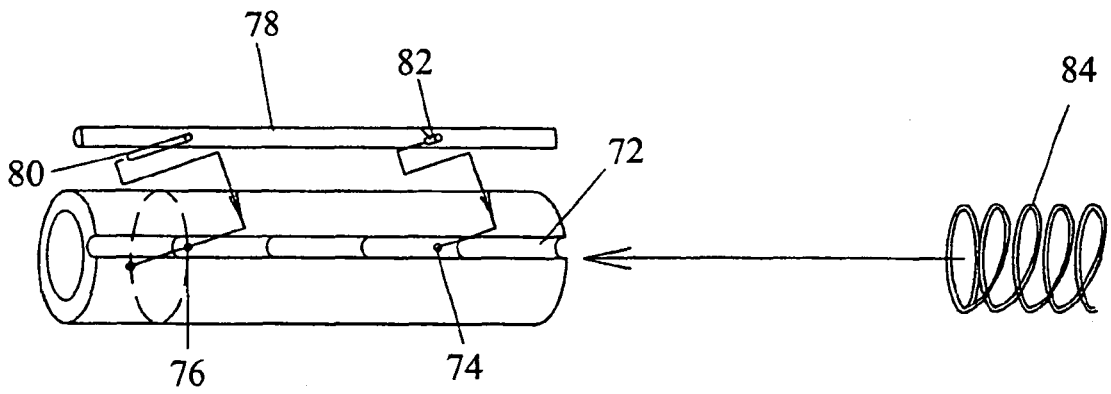


Fig. 10

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 0527766 A [0002]
- US 2881028 A [0004]
- US 5645140 A [0009]