



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
19.08.2015 Bulletin 2015/34

(51) Int Cl.:
F41G 1/467 (2006.01)

(21) Application number: **15154260.2**

(22) Date of filing: **09.02.2015**

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

(71) Applicant: **Brolis, Angelo**
20069 Vaprio d'Adda (Milan) (IT)

(72) Inventor: **Brolis, Angelo**
20069 Vaprio d'Adda (Milan) (IT)

(74) Representative: **Lunati & Mazzoni S.r.L.**
Via Carlo Pisacane, 36
20129 Milano (IT)

(30) Priority: **14.02.2014 IT MI20140218**

(54) **SIGHT DEVICE FOR A BOW**

(57) A sight device (1) for a bow (10) is provided defining a longitudinal axis (10a) and a transversal plane (10b) perpendicular to the longitudinal axis (10a); the sight device (1) comprising a coupling (2) suitable to connect said sight device (1) to the bow (10); a sight (3); a first adjustment system (4) suitable to define a first sliding axis (4a) for the sight (3), with respect to the coupling (2); the first sliding axis (4a) being inclined in use with respect to the longitudinal axis (10a) by an angle of less than 30°, a second adjustment system (5) suitable to define a second sliding axis (5a) of the sight (3) with respect to the coupling (2) distinct from the first sliding axis (4a); the second adjustment system (5), in use, is substantially oblique with respect to the transversal plane (10b) and defines with the transversal plane (10b) an angle of inclination (α) of less than 30°, the first adjustment system (4) allows a discrete adjustment of the position of the sight (3).

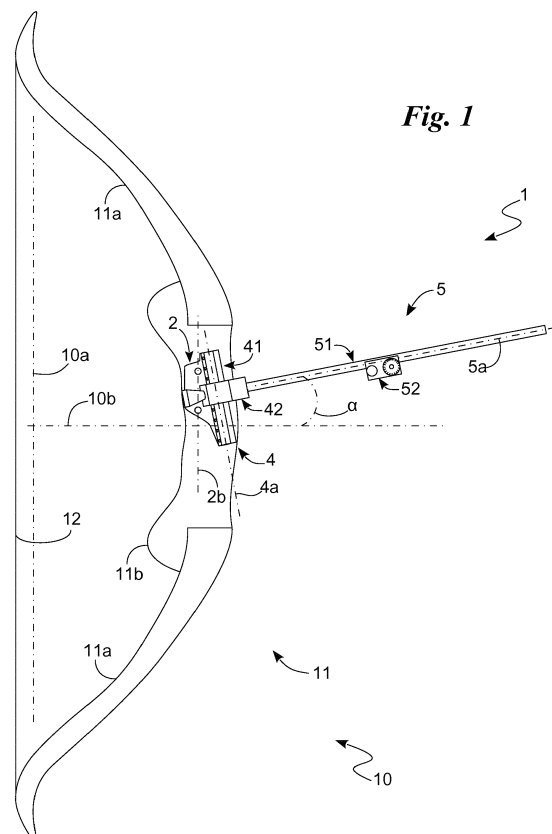


Fig. 1

Description

[0001] The present invention relates to a sight device for a bow of the type as recited in the preamble of the first claim.

[0002] In detail, the invention relates to a sight device designed to determine the line of sight through a sight having a hole and one or more reference pins.

[0003] As known, sight devices for bows on the market comprise a sight through which the line of fire is determined, a coupling suitable to connect the sight device near the grip and two adjustment systems, one vertical and one horizontal, suitable to move the sight in relation to the bow in two different directions, one vertical and one horizontal.

[0004] The vertical adjustment system, which by varying the distance of the sight relative to the ground, adjusts its height to the stature and the firing stance of the archer, is of particular importance.

[0005] It allows a continuous adjustment and includes a cursor suitable to slide along a slideway, for example a rack or a worm screw, integral with the coupling. The continuous adjustment system is required to have high accuracy and a substantially unlimited possibility of adjustment.

[0006] Similar devices are described in the patent applications US-A-4,875,290, US-A-5,414,936, US-A-5,676,122 and US-A-3,271,863.

[0007] The prior art described above has several significant drawbacks.

[0008] A first significant drawback is represented by the fact that sight devices for bows known so far are unable to stably maintain the position and, therefore, require frequent adjustments.

[0009] This drawback is very significant in continuous vertical adjustment systems where the cursor and thus the sight tend to move relative to the adjustment position due to the yieldingness of the constraint of said cursor to the guide.

[0010] This drawback is further increased by the fact that the sight, being arranged so to project from the bow, exerts a force and momentum on the cursor such as to cause an undesirable sliding along the slideway and, thus, the loss of adjustment. On account of these drawbacks, the user of the sight finds himself shooting, unknowingly, with the sight not perfectly adjusted.

[0011] It is also to be noted how, as a result of the aforesaid drawbacks, the adjustment operations of the known sight devices are complex and laborious.

[0012] In addition, the sights of the prior art are often bent by the wind.

[0013] In this situation the technical purpose of the present invention is to devise a sight device for bows able to substantially overcome the drawbacks mentioned above. Within the sphere of said technical purpose one important aim of the invention is to provide a sight device for bows which makes it possible to have a stable and accurate adjustment.

[0014] Another important aim of the invention is to make a sight device for bows that does not need frequent, complex and laborious adjustments of the position of the sight. The technical purpose and specified aims are achieved by a sight device for bows as claimed in the appended Claim 1.

[0015] Preferred embodiments are evident from the dependent claims.

[0016] The characteristics and advantages of the invention are clearly evident from the following detailed description of a preferred embodiment thereof, with reference to the accompanying drawings, in which:

Fig. 1 shows the sight device according to the invention connected to a bow;

Fig. 2 shows a side view of the sight device;

Fig. 3 shows a view from above of the sight device for bows; and

Fig. 4 shows a front view of the sight device according to the invention.

[0017] With reference to said figures, reference numeral **1** globally denotes the sight device for bows according to the invention.

[0018] The sight device **1** is suitable to be applied to a bow **10**, preferably of the Olympic type, known per se.

[0019] Said bow **10** (Fig. 1) comprises an arched portion **11**; and a string **12** suitable to connect the ends of the arched portion **11** and defining a rest configuration in which the string **12** is substantially straight and a configuration of use in which the string **12** is stretched and flexed elastically so as to allow the archer to shoot an arrow releasing said string **12**.

[0020] In particular, the arched portion **11** comprises two arms **11 a** defining the elastically flexible parts of the arched portion **11**; and a riser **11 b** placed between the arms **11 a** and defining the grip of the bow **10**.

[0021] Lastly, the bow **10** defines a longitudinal axis **10a**, i.e. an axis substantially parallel to the string **12** in a rest configuration. The bow **10** further defines a transversal plane **10b**, perpendicular to the longitudinal axis **10a**. In use, generally, the longitudinal axis **10a** is close to or coincides with the vertical axis, i.e. the axis of the gravitational gradient, and the transversal plane **10b** is close to or coincides with the horizontal plane, perpendicular to the vertical axis.

[0022] The sight device **1** comprises a coupling **2** suitable to integrally connect the sight device **1** to the bow **10**; a sight **3** suitably having a hole **3a** (Fig. 4) and, in some cases, at least one reference pin; a first adjustment system **4** defining a first sliding axis **4a** of the sight **3** in relation to the coupling; and a second adjustment system **5** suitable to define a second sliding axis **5a** of the sight **3** in relation to the coupling **2** distinct from the sliding axis **4a**.

[0023] Conveniently, the first adjustment system **4** permits a discrete regulation of the position of the sight **3**, as further explained below.

[0024] Advantageously, the second sliding axis 5a is substantially oblique with respect to the transversal plane 10b and defines therewith an angle of inclination α . It may vary in length, even considerably.

[0025] The term "substantially", often used, means that the values indicated are the result of approximate measurements which may vary as a result of inaccuracies of any kind, such as instrumental.

[0026] The inclination angle α is not zero, because the second sliding axis 5a is substantially oblique, and is preferably less than 30°.

[0027] More preferably the angle of inclination α is between 4° and 15°.

[0028] The first sliding axis 4a is parallel or oblique to the longitudinal axis 10a (Fig. 1) and inclined in use with respect to said longitudinal axis 10a by an angle of less than 30°. It is also preferably perpendicular to the second sliding axis 5a (Fig. 2). The coupling 2 is suitable to constrain the sight device 1 to the arched portion 11 and, more precisely, to the riser 11 b.

[0029] It comprises a plate, suitably of steel, and coupling means 2a, in particular comprising holes for screws and the like, suitable to integrally constrain the plate and, thus, the coupling 2 to the riser 11 b. The riser 11 b usually has in fact threaded connection holes for sights, preferably vertically aligned. The arrangement of the coupling means 2a and in particular of the holes, thus defines the angular position of the sight and said inclinations of the axes 4a and 5a. In particular, at least two holes define an axis of conjunction 2b between the two holes which is inclined by said angle of inclination α with the first sliding axis 4a.

[0030] Integral with the coupling 2 the sight device 1 has the adjustment system 4.

[0031] This first adjustment system 4 includes a slideway 41 defining the first sliding axis 4a, a cursor 42 suitable to slide along the slideway 41; and a discretisation device suitable to define distinct stop positions between the cursor 42 and slideway 41.

[0032] The discretisation device comprises holes 43 made on the slideway 41; and a stop 44 designed to protrude from the cursor 42 and engage the holes 43 constraining the cursor 42 to the slideway 41.

[0033] The holes 43 have axes aligned along a direction substantially parallel to the sliding axis 4a and are equally distanced from each other along the sliding axis 4a so as to define a step between substantially constant adjacent stop positions.

[0034] The stop 44 comprises an engagement pin joined to the cursor 42 by threading so as to rotate and, thus, translate engaging the holes 43; and a grip by means of which the archer is able to rotate the engagement pin commanding its insertion in the holes 43.

[0035] Integral with the cursor 42, the sight device 1 has the adjustment system 5.

[0036] The adjustment system 5 comprises a sliding rod 51 integral with the cursor 42 and defining the sliding axis 5a; a carrier 52 suitable to slide along the rod 51 and

to support the sight 3; and a stop member 53, such as a screw, integral with the carrier 52 and suitable to constrain the carrier 52 to the rod 51, preferably by means of clamping (Fig. 3).

[0037] The sliding rod 51, in order to avoid a rotation of the carrier 52 around the axis 5a, has a polygonal cross section and, in particular, a triangular one as illustrated in Fig. 4.

[0038] It is made of aluminium or carbon fibre and, in particular, in one piece with the cursor 42.

[0039] The rod 51 also has a strip of writable material, in particular of a light colour, having an extension almost equal to the rod 51 and on which the archer can mark one or more positions of the carrier 52 and, thus, the sight 3.

[0040] Lastly, interposed between the carrier 52 and the sight 3 (Figs. 3 and 4), the sight device 1 has an adjustment member 6 suitable to translate the sight 3 with respect to the carrier 52 along an axis of movement 6a almost perpendicular to the sliding axes 4a and 5a; and a hinge 7 suitable to rotate the sight 3 with respect to the carrier 52 and, in particular, to the adjustment member 6.

[0041] The adjustment member 6 is substantially identifiable in a screw nut system 61 suitable to reciprocally rotate around the axis of movement 6a by varying the extension of the member 6 and, thus, by moving the sight 3 along the axis of movement 6a. It also comprises a knob 62 suitable to command the relative rotation between the screw and nut and appropriately graduated so that the archer can measure the deviation of the sight 3 along the axis of movement 6a according to the rotation of the knob 62.

[0042] The invention comprises a new method for adjusting a sight device for a bow suitable to preferably be performed using the sight device 1 described above structurally.

[0043] The adjustment method requires that the archer constrains the sight device 1 to the bow joining the coupling 2 to the riser 11 b, grasping the bow 10 simulating the firing position and, in particular, arranging the longitudinal axis 10a vertically, i.e. substantially perpendicular to the gravitational gradient.

[0044] At this point, the archer adjusts the sight device 1 and, in particular, the height from the ground of the sight 3 moving it along two sliding axes 4a and 5a of which at least one and, preferably, at least the axis 5a is oblique to the transversal plane 10b. More preferably, the sliding axes 4a and 5a are almost perpendicular to each other and are both inclined with respect to the plane 10b of the angle of inclination α .

[0045] In particular, the archer calibrates the height from the ground of the sight 3 by first performing a coarse adjustment of the sight device 1 with the first sliding system 4 and, subsequently, a fine adjustment of the sight device 1 with the sliding system 5.

[0046] During the coarse adjustment the archer moves the cursor 42 and the sight 3 along the slideway 41, i.e.

along the first sliding axis 4a, defining a sliding having a greater vertical than horizontal component, i.e. parallel to the axis 10a.

[0047] Once the height of the sight 3 from the ground is close to that wished, the archer inserts the stop 44 in the hole 43 proximal to this position finishing the coarse adjustment of the sight device 1.

[0048] Subsequently the fine adjustment takes place in which the archer moves the carrier 52 and the sight 3 along the sliding rod 51, i.e. along the second sliding axis 5a, defining a sliding component having a non-zero vertical component and lesser than the horizontal component.

[0049] Once the height of the sight 3 from the ground is close to that wished, the archer, thanks to the stop member 53, clamps the carrier 52 to the sliding rod 51 completing the fine adjustment.

[0050] Lastly, if the position of the sight 3 and, in particular, of the hole 3a or the pin are not optimal, the archer performs a final adjustment.

[0051] In this final adjustment, the archer actuates the adjustment member 6 by translating the sight 3 along the axis of movement 6a and thus varying the distance of the sight 3 from the carrier 52 and, thanks to the hinge 7, rotates the sight 3 making the hole 3a face the eye of the archer.

[0052] The invention achieves important advantages.

[0053] A first advantage is the ease and speed of adjustment of the sight device 1.

[0054] In fact, the coarse adjustment, using a discrete translation of the sight 3 along the first sliding axis 4a with respect to the longitudinal axis 10a, has a predominantly vertical component, and thus permits quick achievement of the position of the sight 3 close to the desired point.

[0055] At the same time, the fine adjustment, by exploiting a continuous translation of the sight 3 along a sliding axis 5a inclined by 4°-15° with respect to the longitudinal axis 10a, has a much greater horizontal component than vertical component. It therefore allows a precise adjustment of the height of the sight 3 thanks to vertical deviations of reduced breadth compared to those of the cursor 42 along the slideway 41.

[0056] Another advantage is the fact that the sight device 1 is able to stably maintain its position and does not therefore require frequent adjustments.

[0057] In fact, the adoption of a discrete adjustment system 4 makes it possible to stably secure the cursor 42 to the slideway 41 avoiding unwanted vertical deviations.

[0058] In addition, the continuous adjustment system 5, being inclined by 4°-15° with respect to the transversal plane 10b, is substantially vertical so that the sight 3 exerts on the carrier 52 only a force and momentum of almost negligible intensity and thus unable to determine unwanted large deviations.

[0059] Another advantage given by the possibility of using a discrete adjustment system 4 and a continuous

movement system 5 to adjust the height from the ground of the sight 3 is identifiable in the extreme precision of adjustment of the sight device 1. Furthermore, the possibility of varying the height precisely by acting on the movement system 5 only makes it possible to adapt, in a simple and fast manner, the sight device 1 to targets located at different distances.

[0060] Furthermore, the increased surface area of the sight 1 i.e. that of the first adjustment system 4 is alongside the riser 11 b, and thus not exposed to the wind. The sight 1 is thus not flexed by the wind.

[0061] Variations may be made to the invention without departing from the scope of the inventive concept expressed in the independent claims and by their technical equivalents. In such scope, all the elements as described and claimed herein may be replaced with equivalent elements and the scope of the invention includes all other details, materials, shapes and dimensions.

Claims

1. A sight device (1) for a bow (10) defining a longitudinal axis (10a), i.e. an axis substantially parallel to the string 12 in a rest configuration, and a transversal plane (10b) perpendicular to said longitudinal axis (10a); said sight device (1) comprising a coupling (2) suitable to connect said sight device (1) to said bow (10); a sight (3); a first adjustment system (4) suitable to define a first sliding axis (4a) for said sight (3), with respect to said coupling (2); said first sliding axis (4a) being inclined, in use, with respect to said longitudinal axis (10a) at an angle of less than 30°, a second adjustment system (5) suitable to define a second sliding axis (5a) of said sight (3) with respect to said coupling (2) separate from said first sliding axis (4a); **characterised in that** said second adjustment system (5), in use, is arranged substantially obliquely with respect to said transversal plane (10b) and defines with said transversal plane (10b) an angle of inclination (α) of less than 30°, and **in that** said first adjustment system (4) permits a discrete adjustment of the position of said sight (3).
2. The sight device (1) as claimed in the preceding claim, wherein said angle of inclination (α) is substantially comprised between 4° and 15°.
3. The sight device (1) as claimed in one or more of the preceding claims, wherein said sliding axes (4a, 5a) are substantially reciprocally perpendicular.
4. The sight device (1) as claimed in one or more of the preceding claims, wherein said first adjustment system (4) includes a slideway (41) defining said first sliding axis (4a), a cursor (42) suitable to slide along said slideway (41) and a discretisation device suitable to define distinct stop positions between said cur-

sor (42) and said slideway (41).

5. The sight device (1) as claimed in the preceding claim, wherein said first discretisation device comprises holes (43) obtained in said slideway (41); and a retainer (44) protruding from said cursor (42) which engages with said holes (43) to block said cursor (42) on said slideway (41). 5
6. The sight device (1) as claimed in one or more of the preceding claims, comprising an adjustment member (6) suitable to translate said sight (3) along an axis of movement (6a) practically perpendicular to said sliding axes (4a and 5a). 10
7. A method for adjusting a sight device (1) for a bow (10) defining a longitudinal axis (10a), i.e. an axis substantially parallel to the string 12 in a rest configuration; said adjustment method being **characterised in that** it comprises a discrete and a coarse adjustment in which a first adjustment system (4) moves a sight (3) in relation to said bow (10) along a first sliding axis (4a) inclined, in use, with respect to said longitudinal axis (10a) by an angle of less than 30°; a fine adjustment in which a sliding system (5) moves said sight (3) with respect to said bow (10) along a second sliding axis (5a) distinct from said first sliding axis (4a) and defining with said transversal plane (10b) an angle of inclination (α) of less than 30°. 15 20 25 30

35

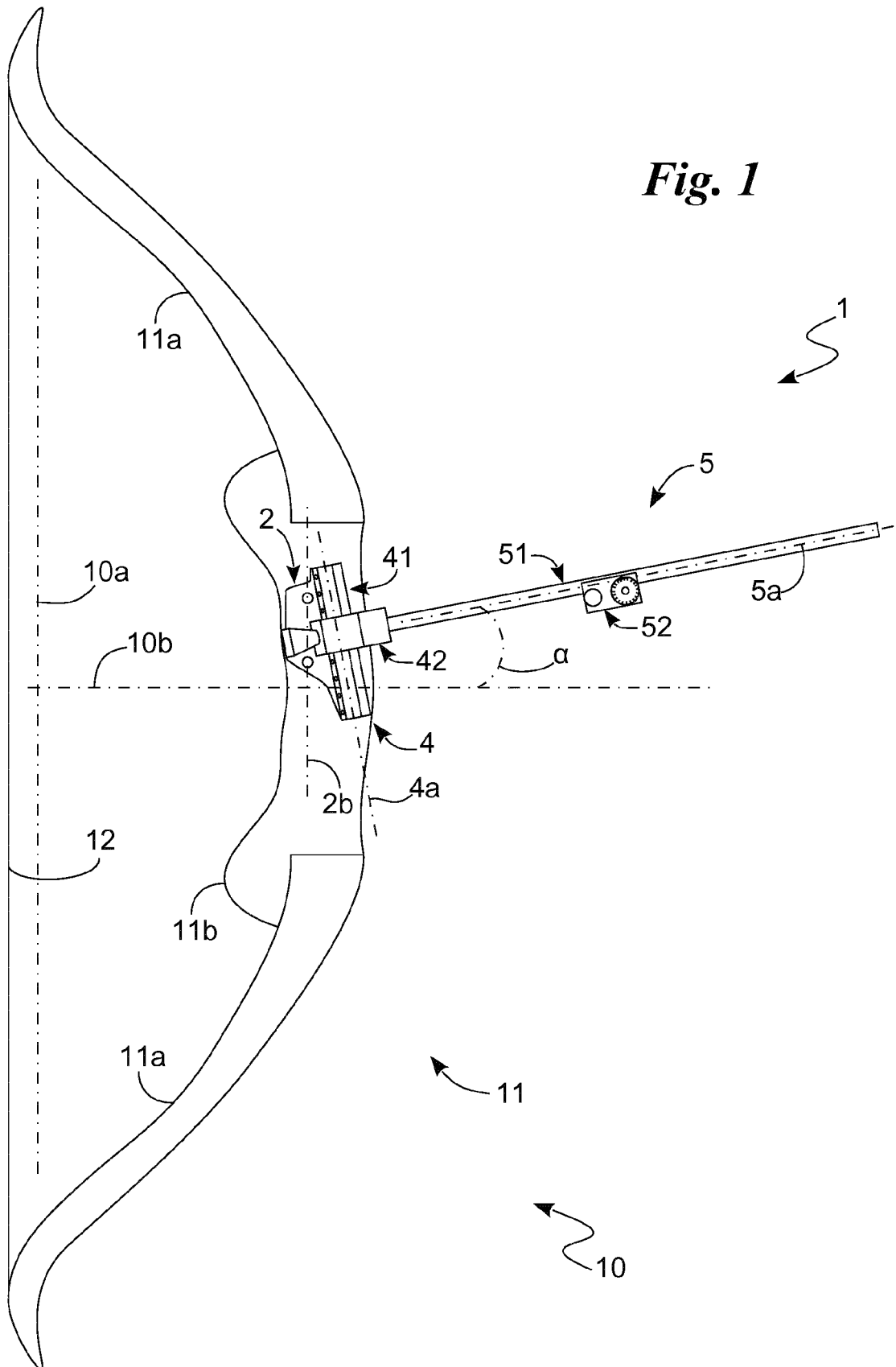
40

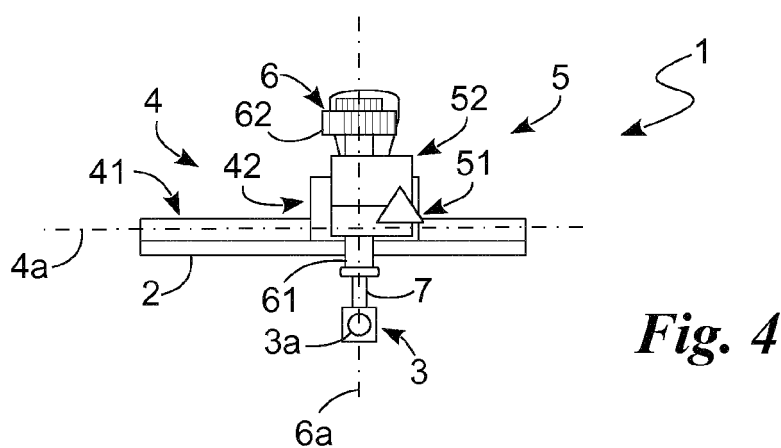
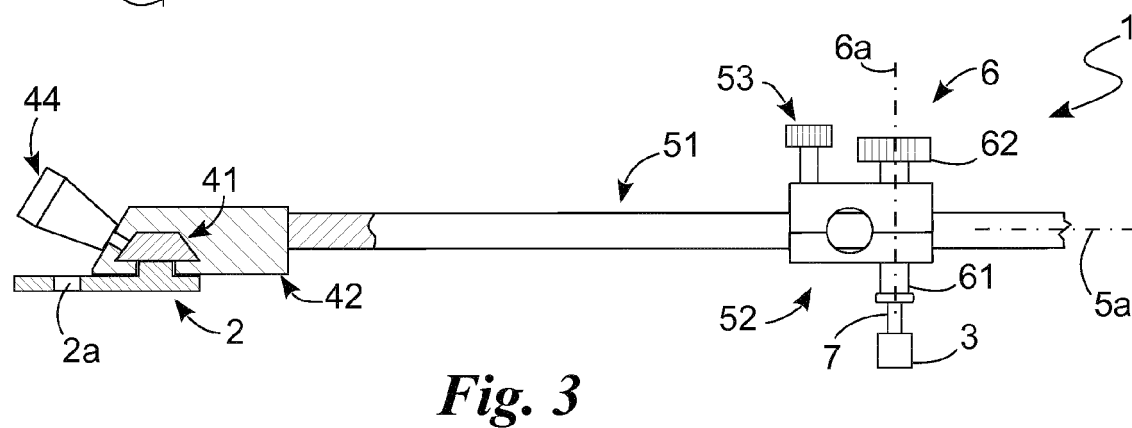
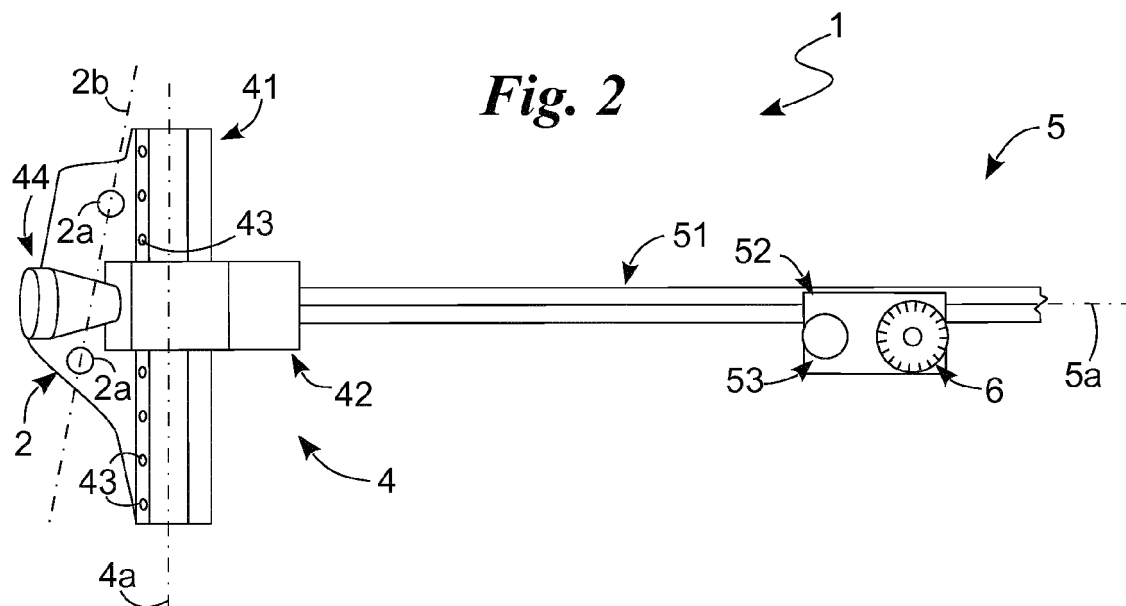
45

50

55

Fig. 1







EUROPEAN SEARCH REPORT

Application Number
EP 15 15 4260

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X,D	US 4 875 290 A (FINCH JACK A [US]) 24 October 1989 (1989-10-24) * column 3, lines 2-13 * * figures 1, 13, 14 *	1-7	INV. F41G1/467
A,D	US 5 414 936 A (SAPPINGTON DONALD R [US]) 16 May 1995 (1995-05-16) * column 3, lines 37-49 * * figures 1, 2, 4 *	1-7	
A,D	US 5 676 122 A (WISEBY TONY [SE] ET AL) 14 October 1997 (1997-10-14) * column 4, lines 64-65 * * figures 1-3 *	1-7	
A,D	US 3 271 863 A (HARRINGTON CHARLES M) 13 September 1966 (1966-09-13) * column 1, line 51 - column 2, line 11 * * figures 3-5 *	1-7	
A	US 5 507 272 A (SCANTLEN JAYSON R [US]) 16 April 1996 (1996-04-16) * figure 1 *	1,7	TECHNICAL FIELDS SEARCHED (IPC) F41G
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 25 June 2015	Examiner Van Leeuwen, Erik
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	

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 15 15 4260

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.

25-06-2015

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4875290 A	24-10-1989	NONE	
US 5414936 A	16-05-1995	NONE	
US 5676122 A	14-10-1997	SE 503154 C2 US 5676122 A	01-04-1996 14-10-1997
US 3271863 A	13-09-1966	NONE	
US 5507272 A	16-04-1996	NONE	

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 4875290 A [0006]
- US 5414936 A [0006]
- US 5676122 A [0006]
- US 3271863 A [0006]