US009335536B2

(12) **United States Patent**
Russ

(10) **Patent No.: US 9,335,536 B2**
(45) **Date of Patent: May 10, 2016**

(54) **VISUAL TARGET ACQUISITION SCOPE SYSTEM**

(71) Applicant: **Yoachim C. Russ**, Annapolis, MD (US)

(72) Inventor: **Yoachim C. Russ**, Annapolis, MD (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **14/155,044**

(22) Filed: **Jan. 14, 2014**

(65) **Prior Publication Data**

US 2014/0123532 A1 May 8, 2014

Related U.S. Application Data

(63) Continuation-in-part of application No. 13/134,918, filed on Jun. 20, 2011, now abandoned.

(60) Provisional application No. 61/752,406, filed on Jan. 14, 2013.

(51) **Int. Cl.**

G02B 23/00	(2006.01)
G02B 23/14	(2006.01)
F41G 1/38	(2006.01)
F41G 1/30	(2006.01)

(52) **U.S. Cl.**

CPC ***G02B 23/14*** (2013.01); ***F41G 1/38*** (2013.01); *F41G 1/30* (2013.01)

(58) **Field of Classification Search**

CPC F41G 1/387; F41G 1/00; F41G 1/473; F41G 1/04; F41G 1/35; F41G 1/425; F41G 1/30; F41G 1/40; F41G 1/38; F41G 1/383; F41G 1/345; F41G 1/08; F41G 1/54; F41G 1/16; F41G 1/28; F41G 1/26; F41G 1/18; F41G 1/17; F41G 1/02; F41G 1/32; F41G 11/001; F41G 11/003; F41G 11/008; G02B 13/00; G02B 23/00; G02B 23/12; G02B 23/14; G02B 23/145; G02B 23/16; G02B 23/18; G02B 23/2446; G02B 7/002; G02B 7/06; G02B 15/00

USPC 359/362, 399–405, 407, 411, 412, 414, 359/416, 417, 415, 419–424, 428–429, 432, 359/434–435; 396/429–431; 348/73, 75; 42/111, 113, 119–129, 135–141

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,669,833	A *	6/1987	Mise	359/420
2007/0103773	A1 *	5/2007	Schwartz, II	G02B 23/18 359/409
2007/0157502	A1 *	7/2007	Holmberg	F41G 11/003 42/124
2007/0235634	A1 *	10/2007	Ottney	G01J 5/02 250/214 VT

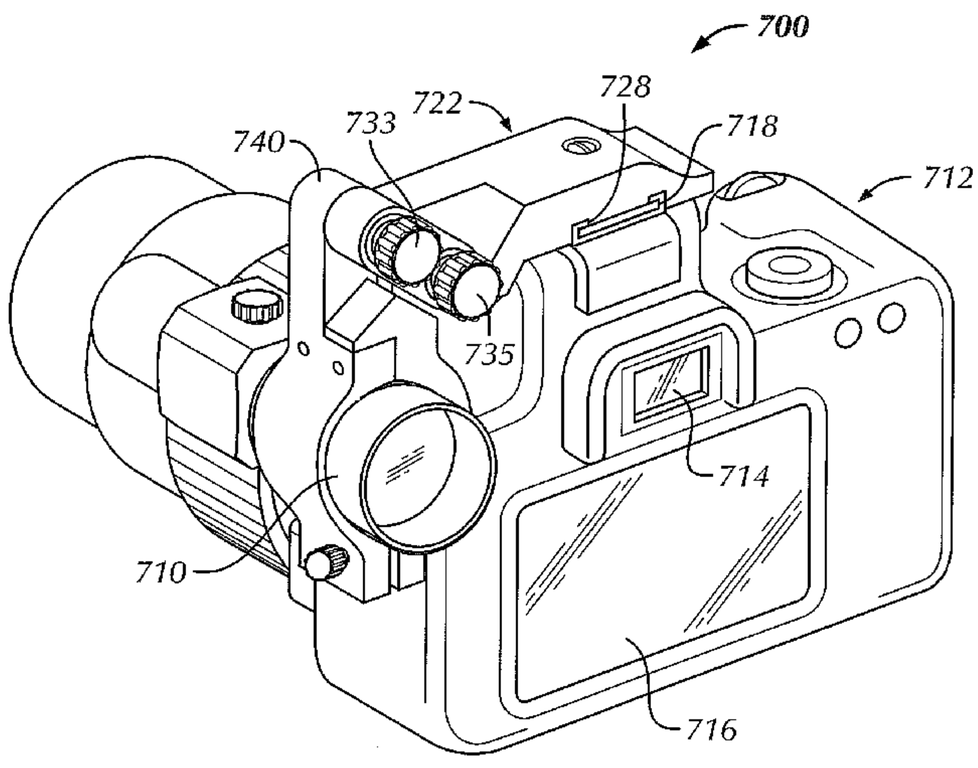
* cited by examiner

Primary Examiner — Thong Nguyen
Assistant Examiner — Jyotsna Dabbi
(74) *Attorney, Agent, or Firm* — Lawrence G. Fridman, Esq.

(57) **ABSTRACT**

In a visual target acquisition scope system for an adjustable connection is provided between a unity magnification scope producing 1× magnification image viewed by one eye of the user and a photographic lens/viewfinder of a photographic camera viewed by another eye of the user. According to the system, while the user is looking at an object through the unity magnification scope with one eye and looking at the object through the photographic camera lens with the second eye, the target visible with the first eye is also visible with the second eye.

12 Claims, 23 Drawing Sheets



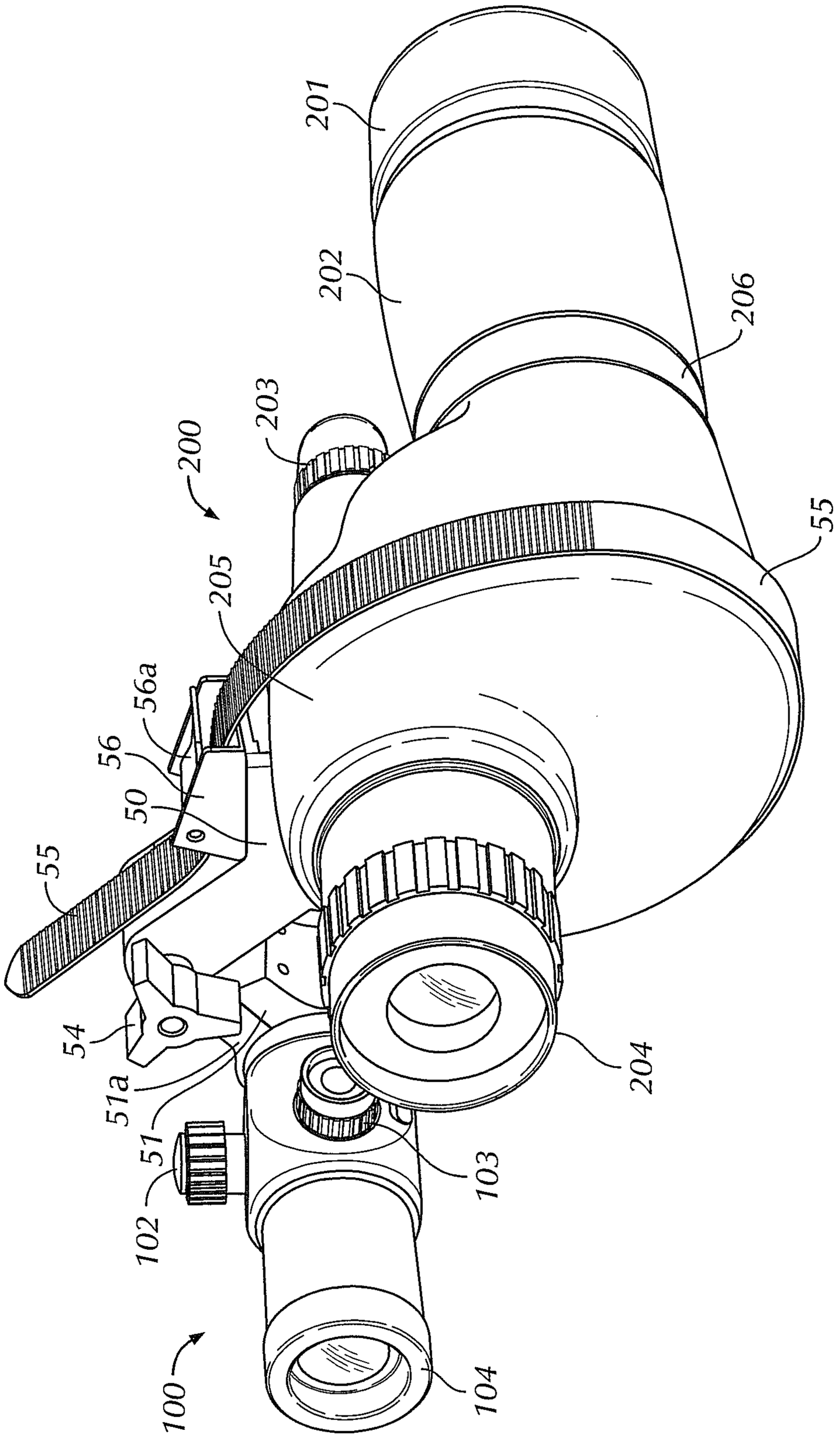

201
202
206
203
200
205
55
56a
56
50
55
54
51a
51
102
103
204
104
100

FIG. 1

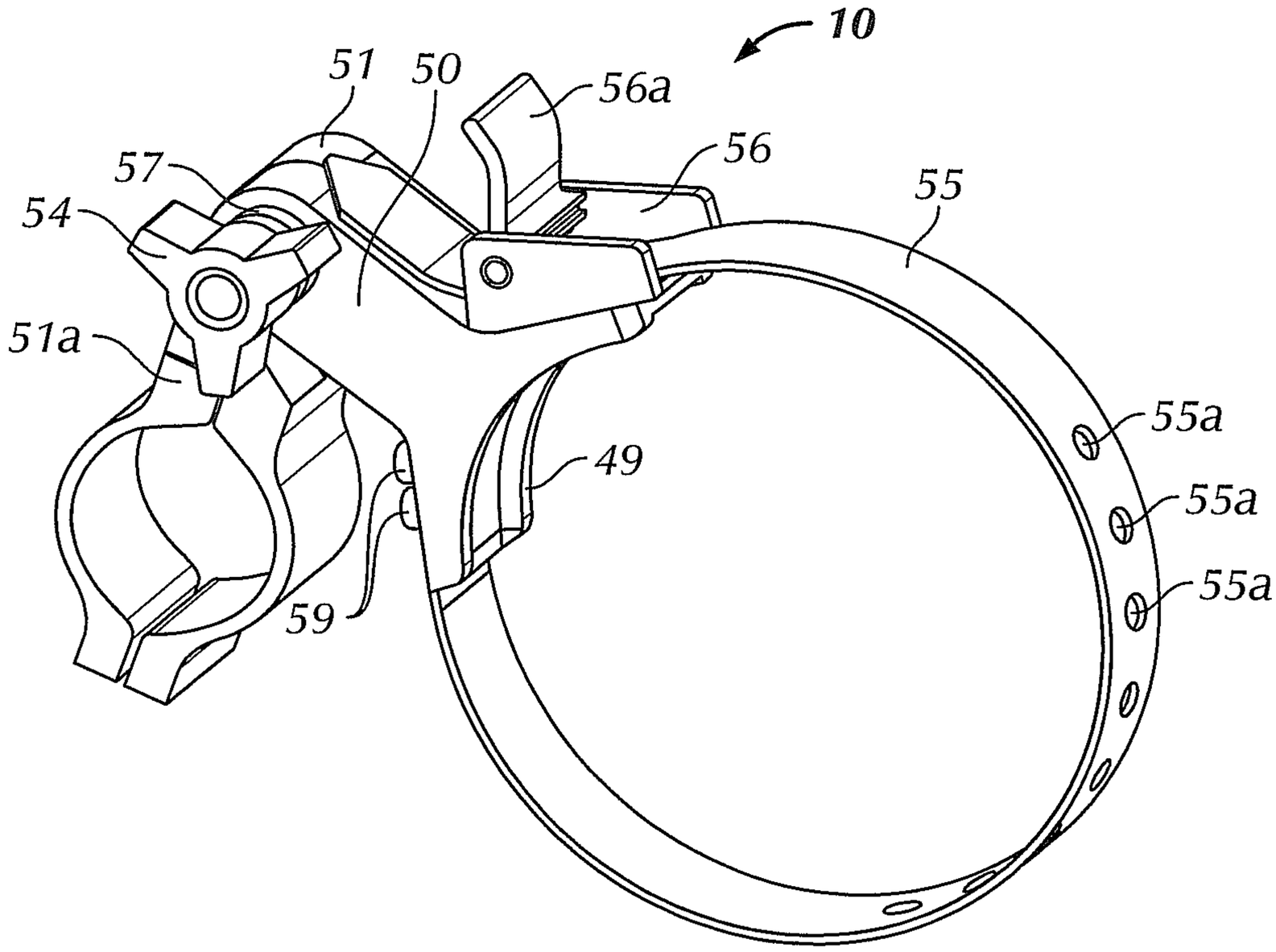


FIG. 2

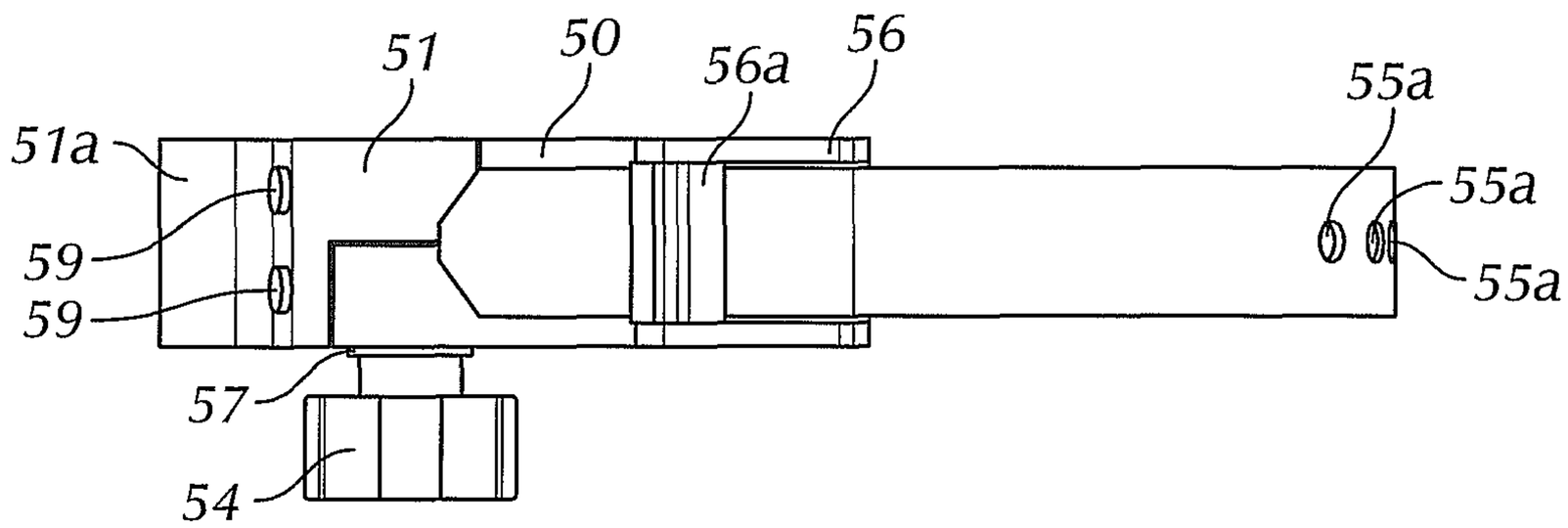

51
50
56a
56
55a
51a
55a
59
55a
59
57
54

FIG. 3

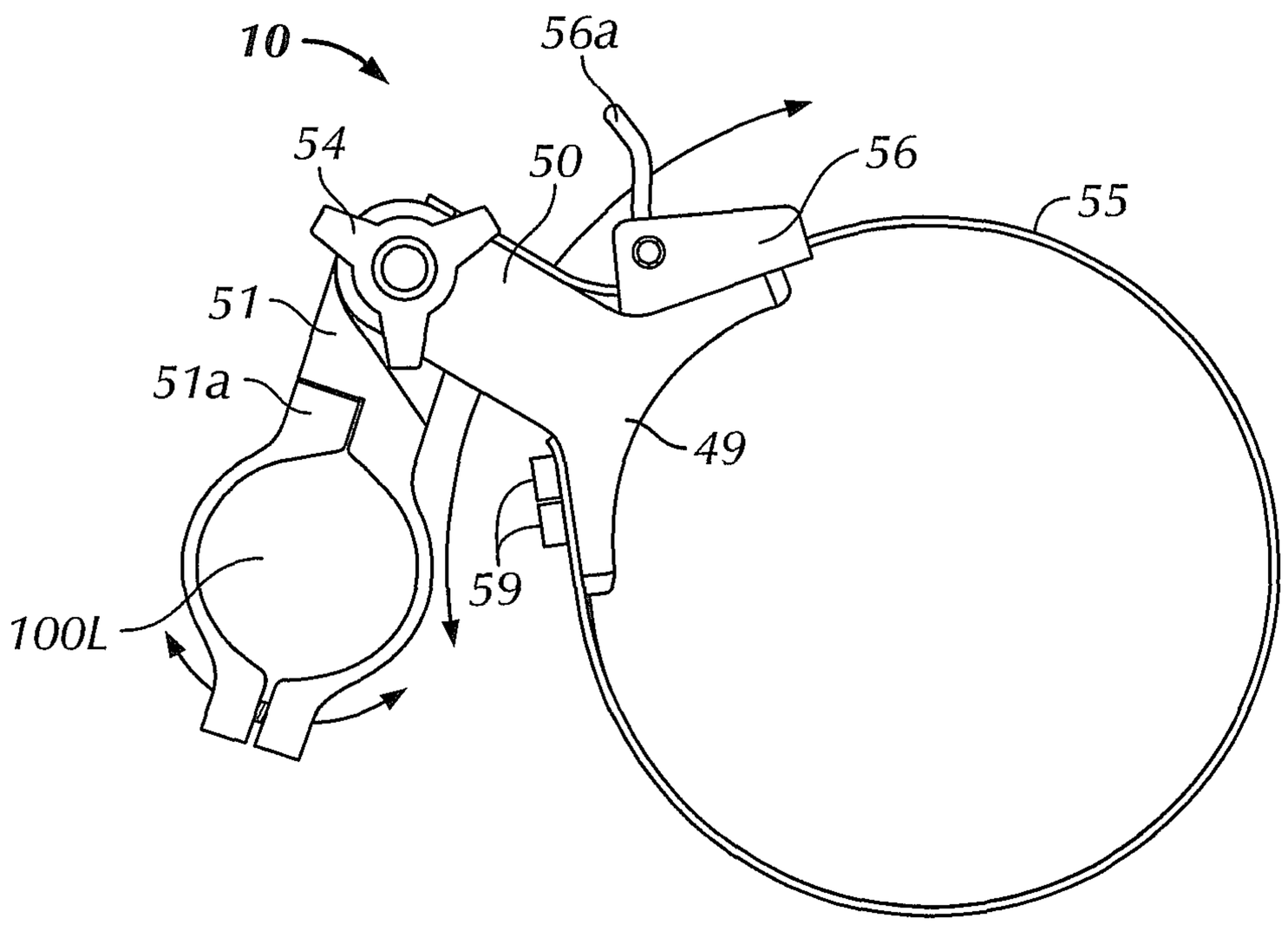

10
56a
54
50
56
55
51
51a
49
59
100L

FIG. 4

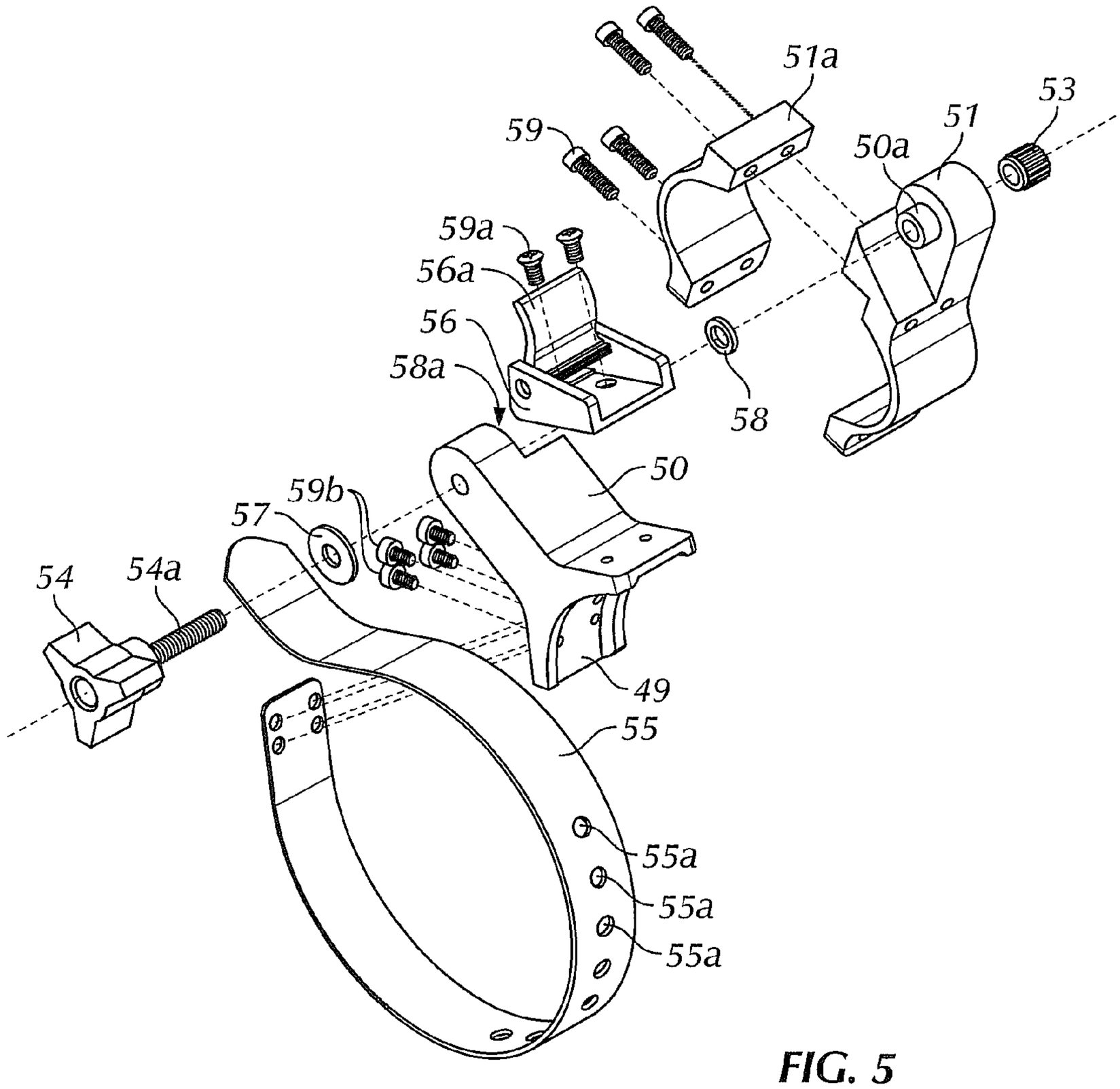

51a
53
59
51
50a
59a
56a
56
58a
58
50
59b
57
54
54a
49
55
55a
55a
55a

FIG. 5

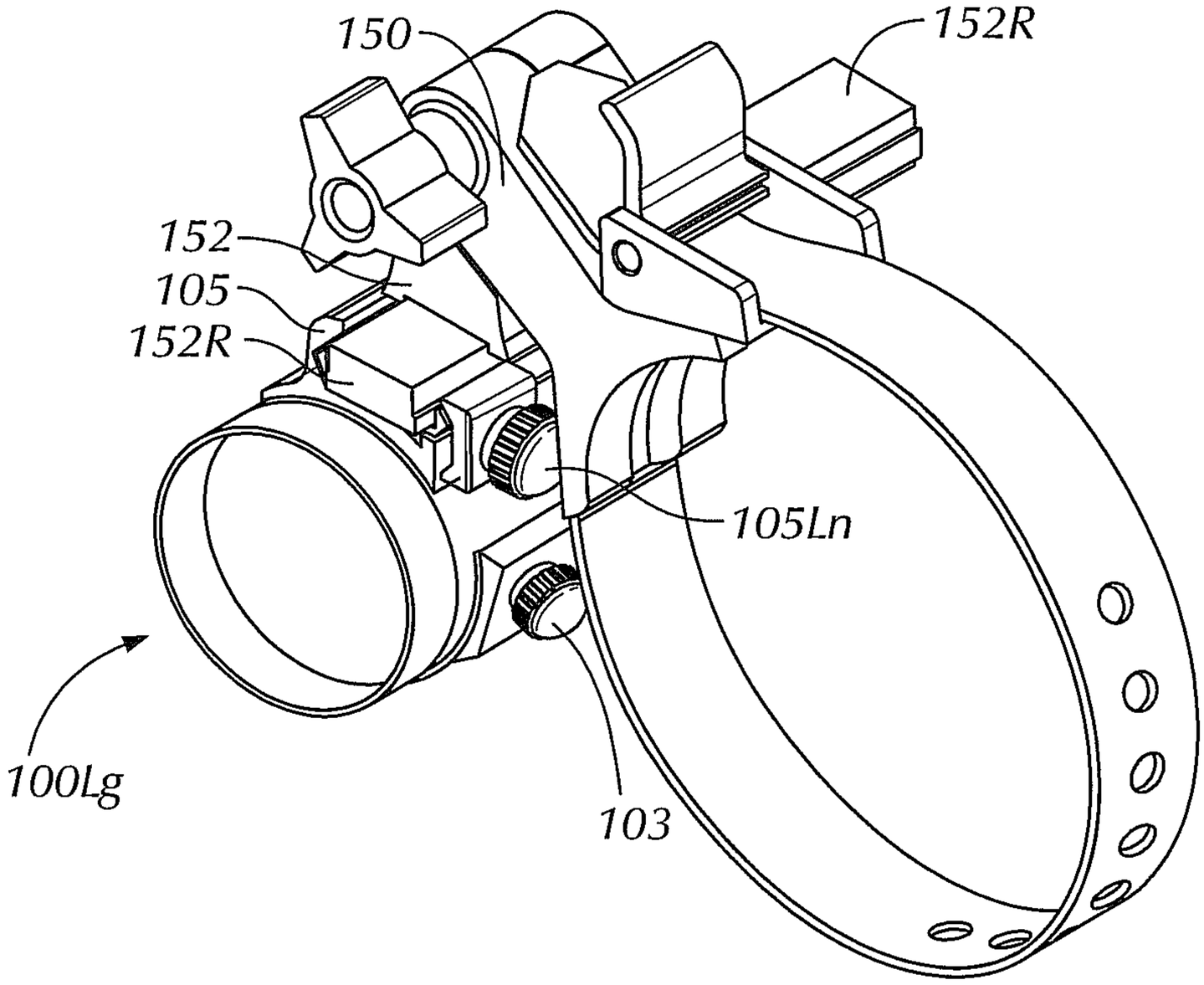


FIG. 6

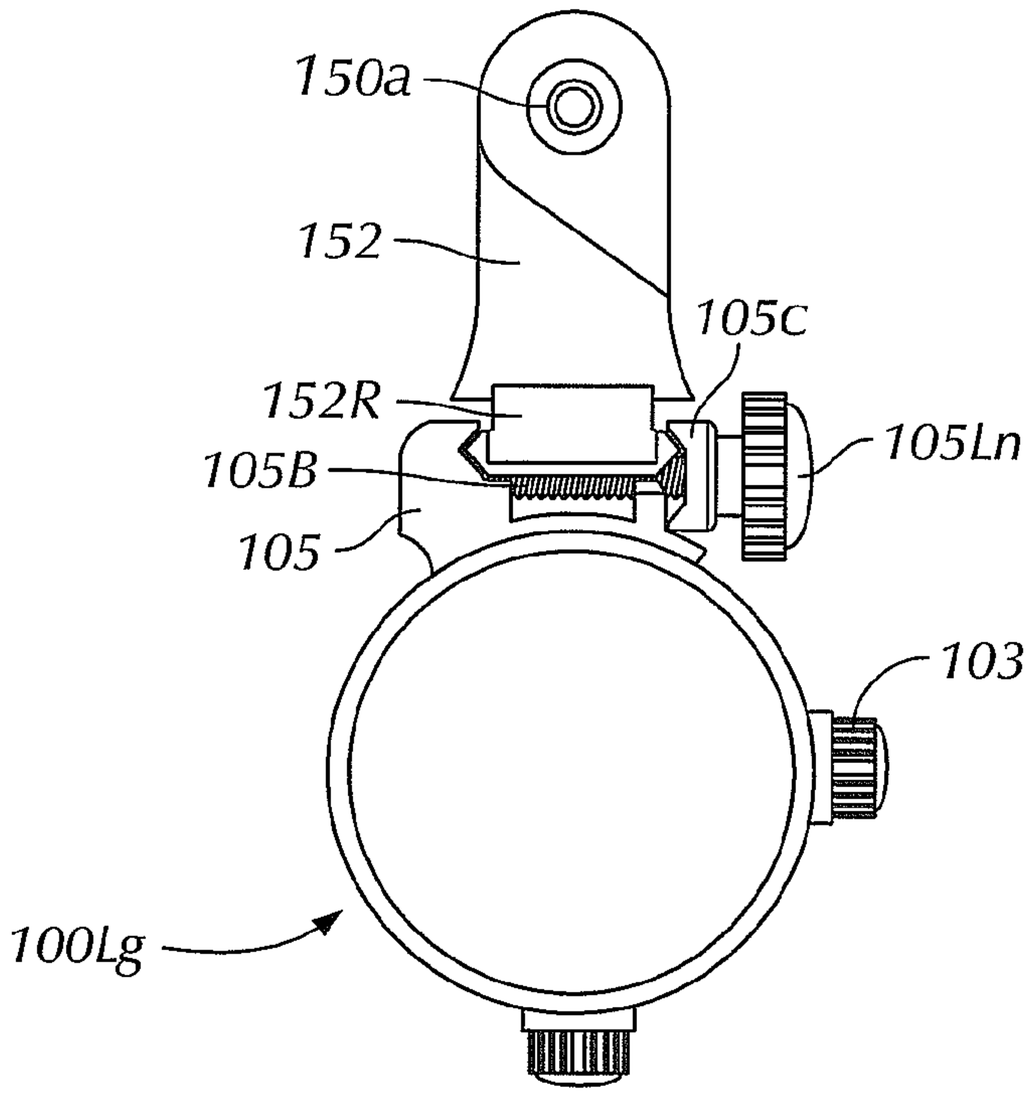

150a
152
105C
152R
105B
105Ln
105
103
100Lg

FIG. 7

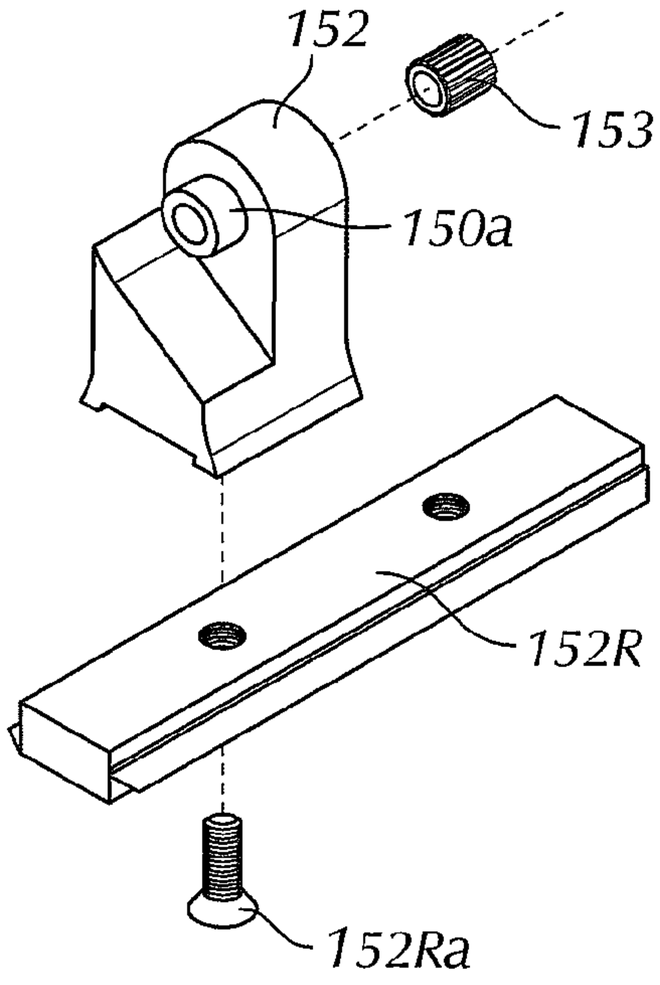

152
153
150a
152R
152Ra

FIG. 8

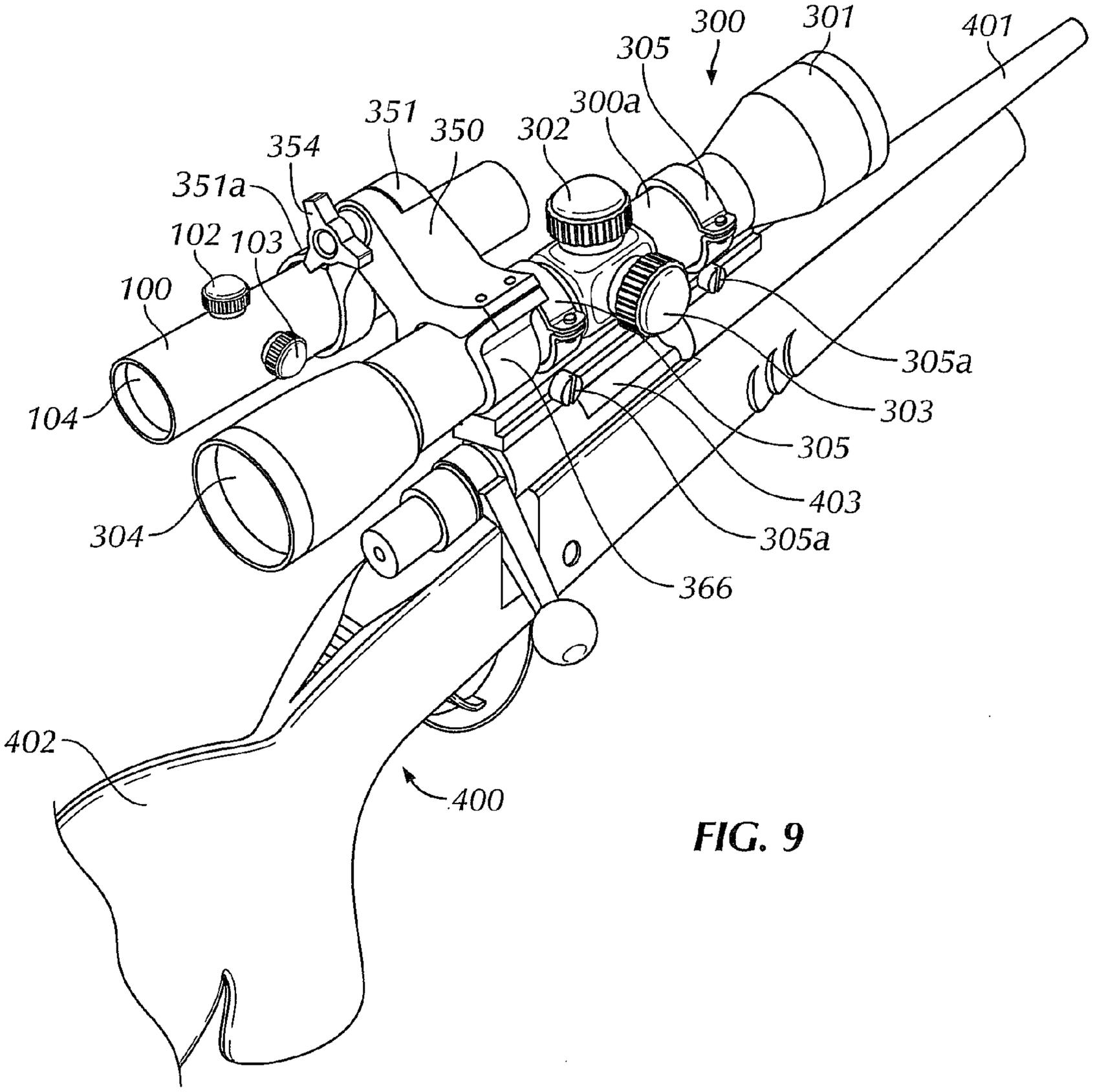

300
301
401
305
300a
351
350
302
354
351a
102
103
100
104
304
305a
303
305
403
305a
366
402
400

FIG. 9

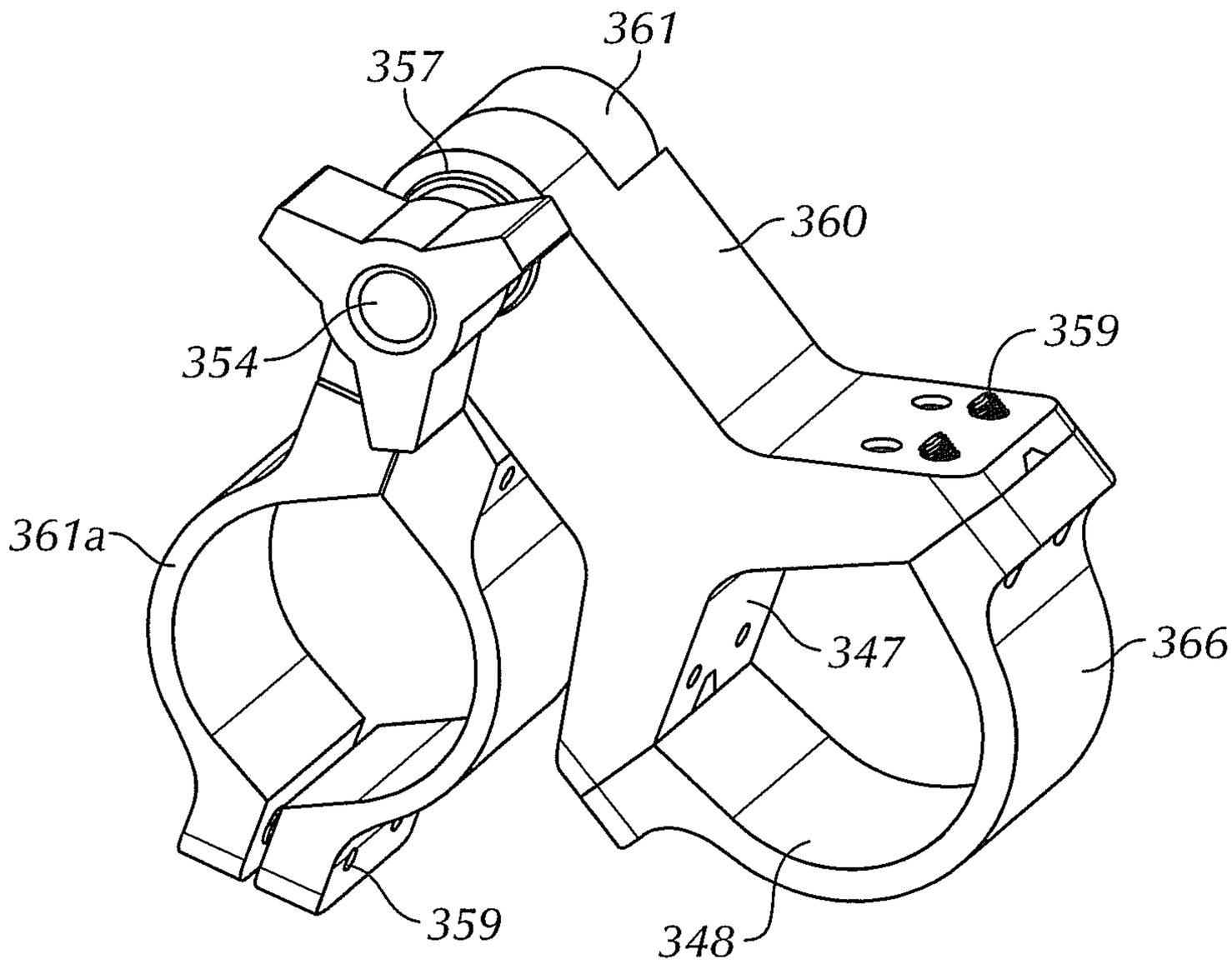


FIG. 10

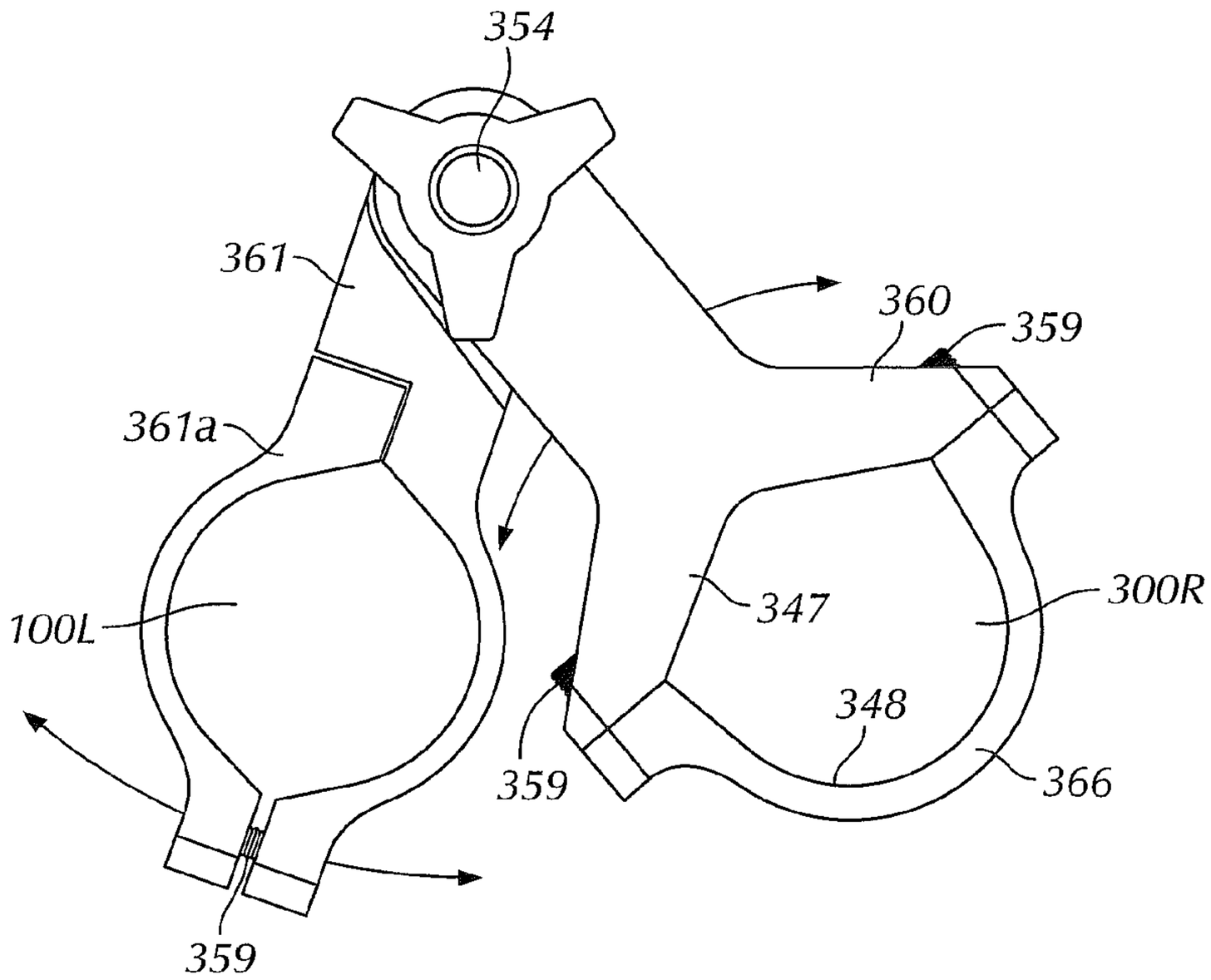

354
361
360
359
361a
347
300R
100L
348
359
366
359

FIG. 11

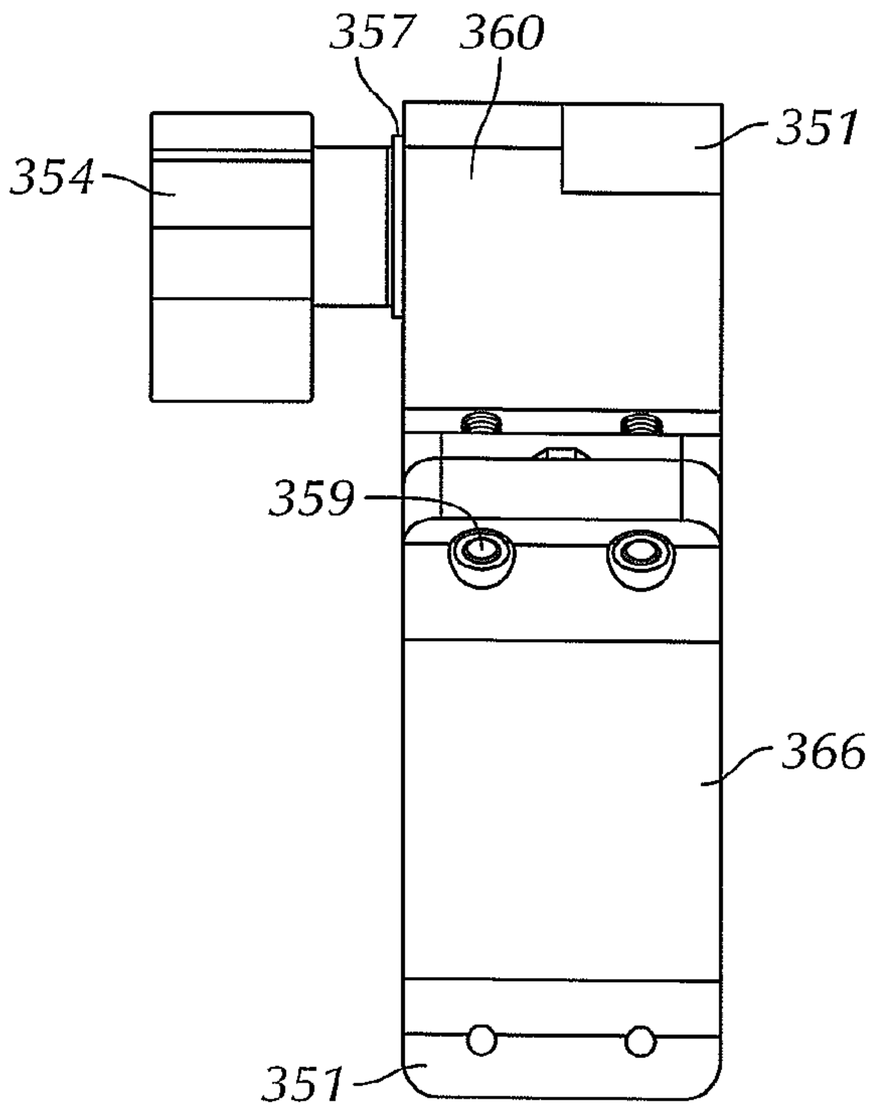

357
360
351
354
359
366
351

FIG. 12

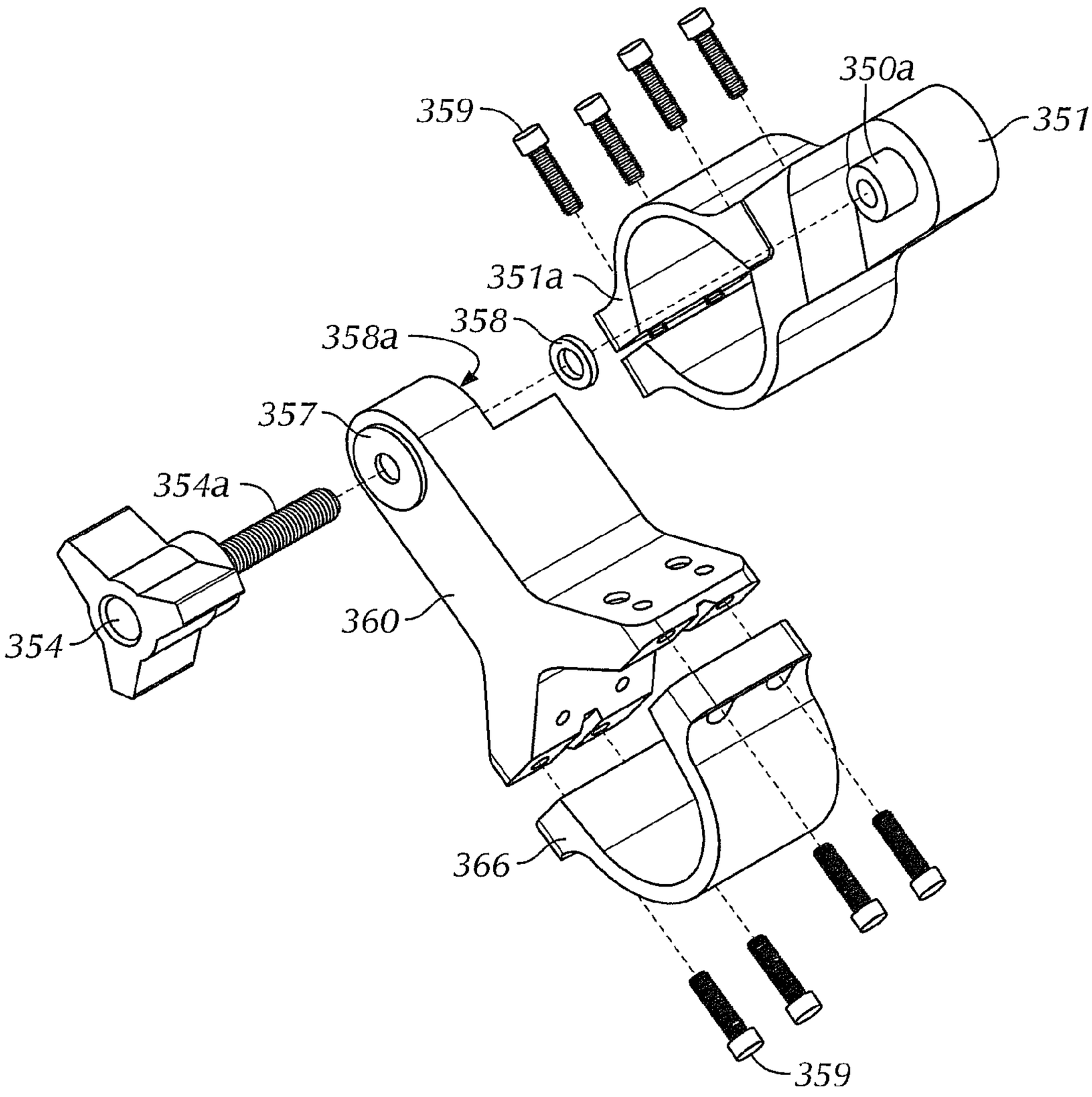


FIG. 13

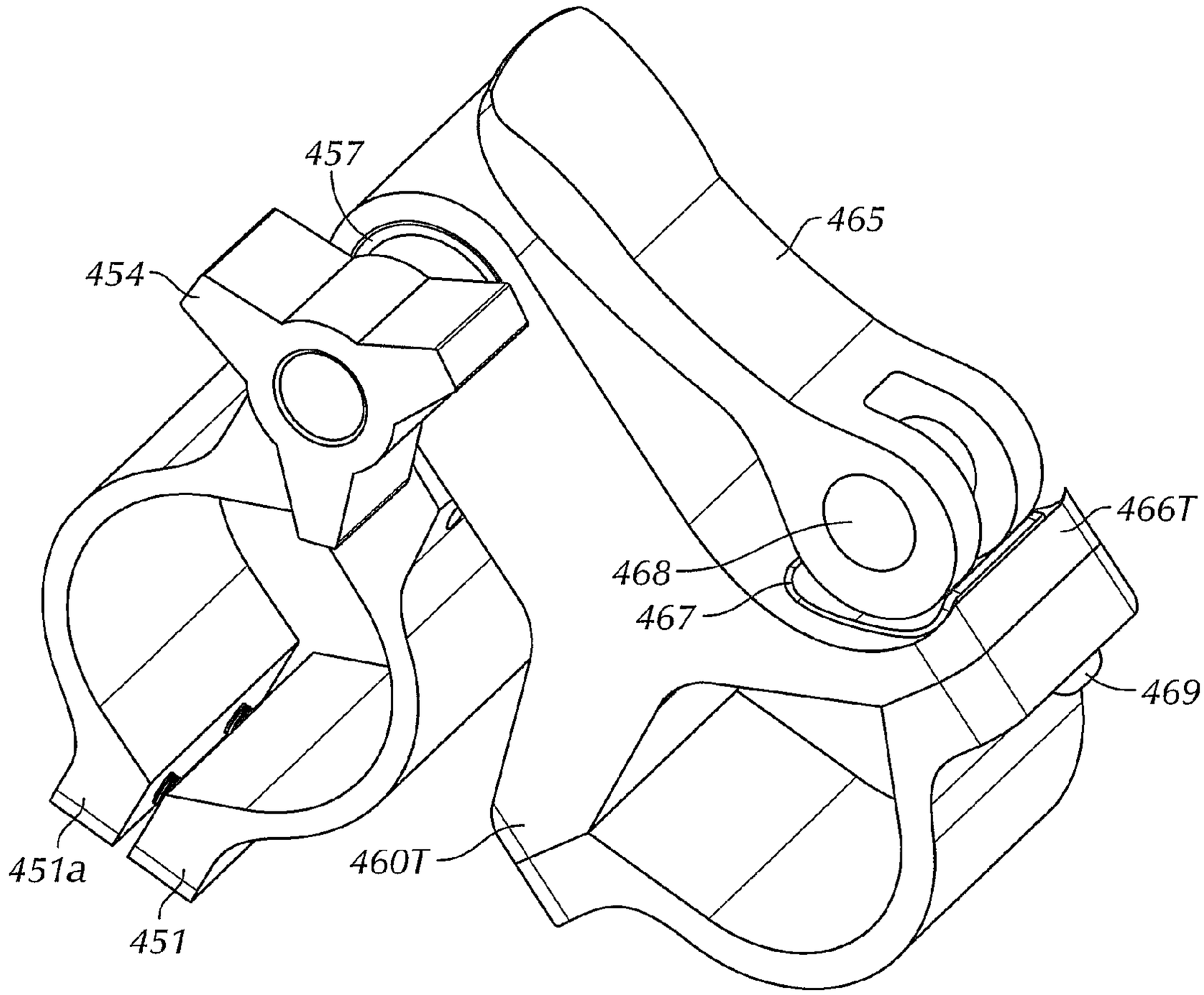


FIG. 14

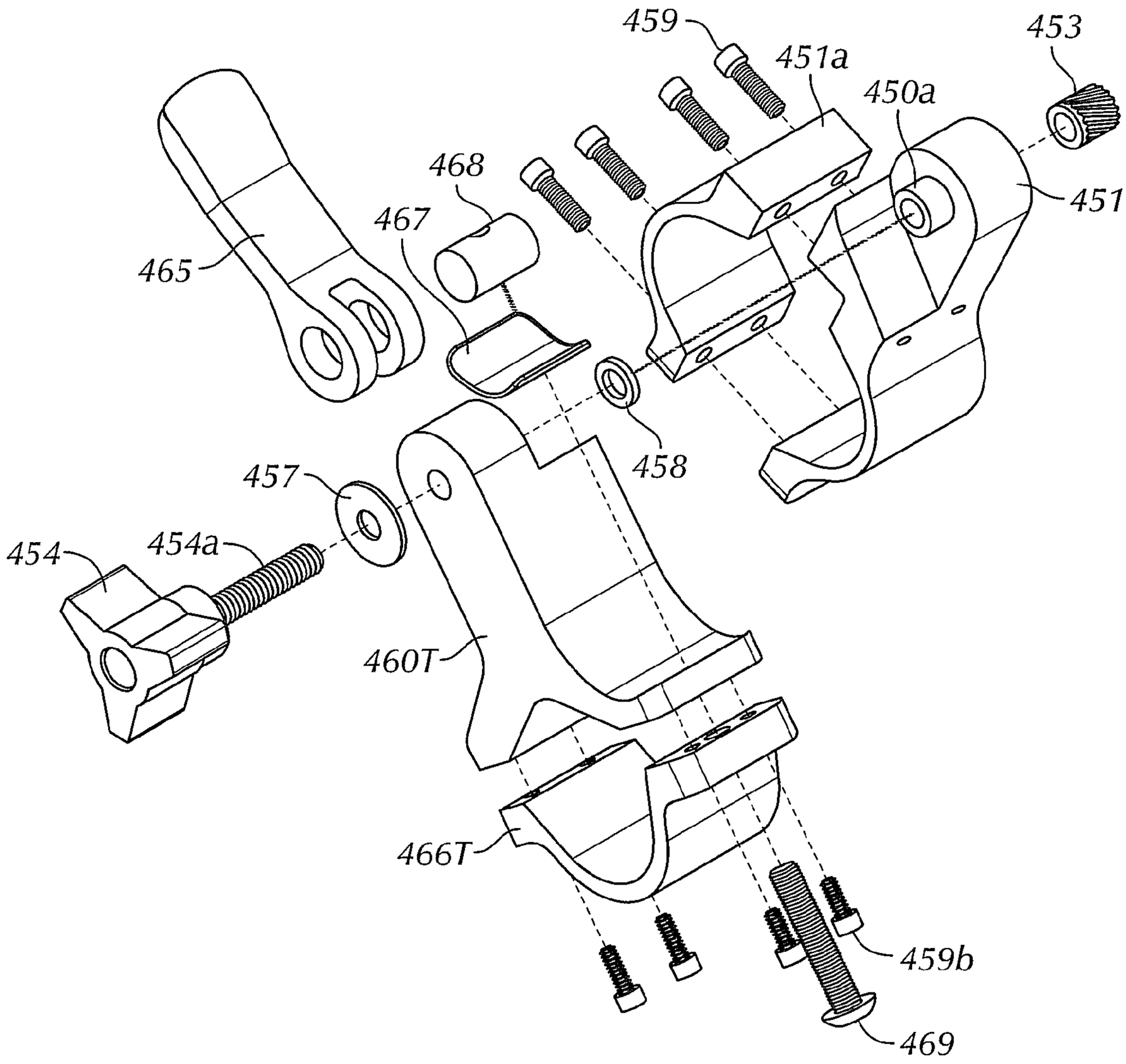

459
451a
453
450a
468
467
451
465
458
457
454
454a
460T
466T
459b
469

FIG. 15

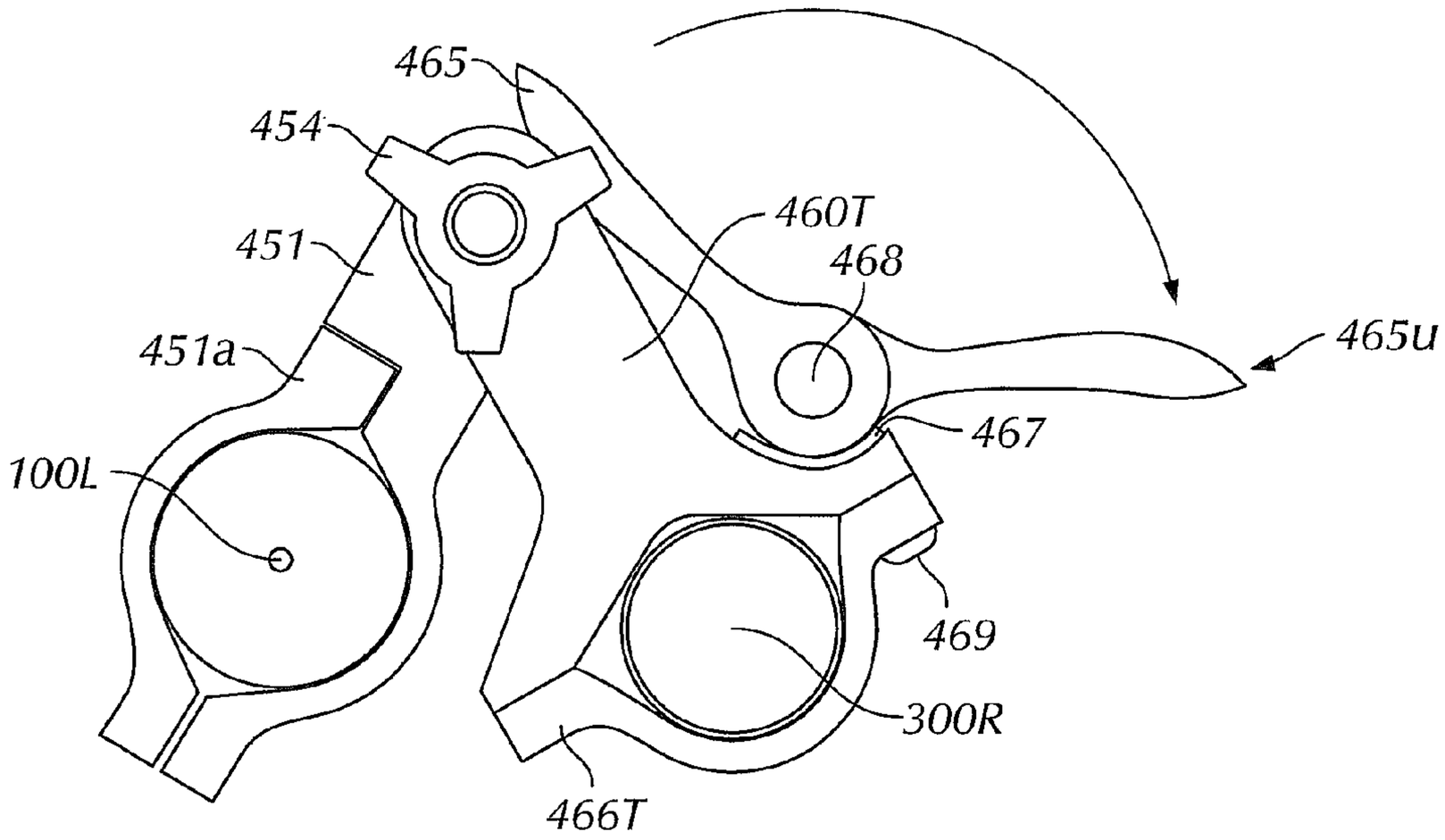

465
454
460T
451
468
451a
465u
467
100L
469
300R
466T

FIG. 16

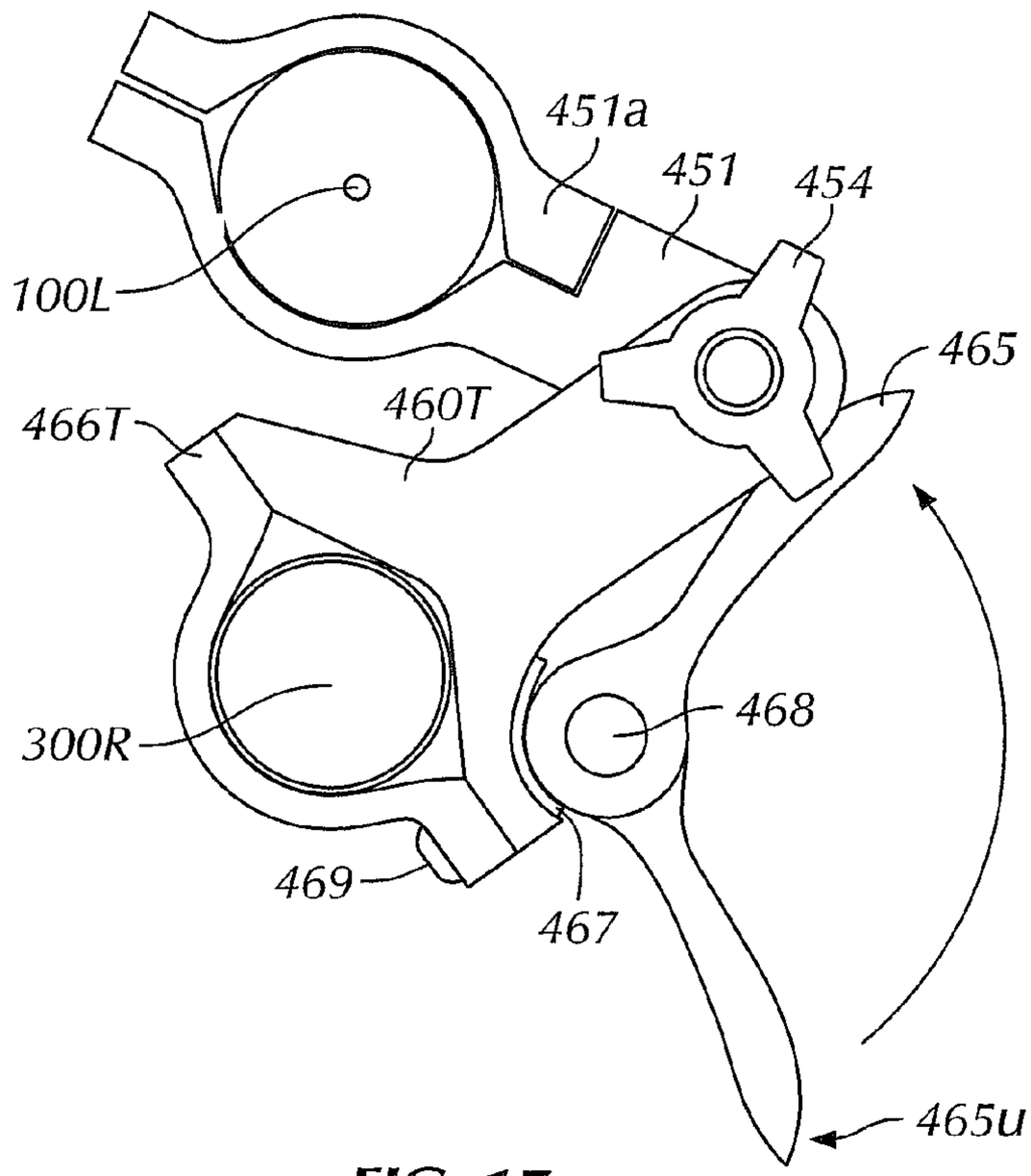

451a
451
454
100L
465
460T
466T
468
300R
469
467
465u

FIG. 17

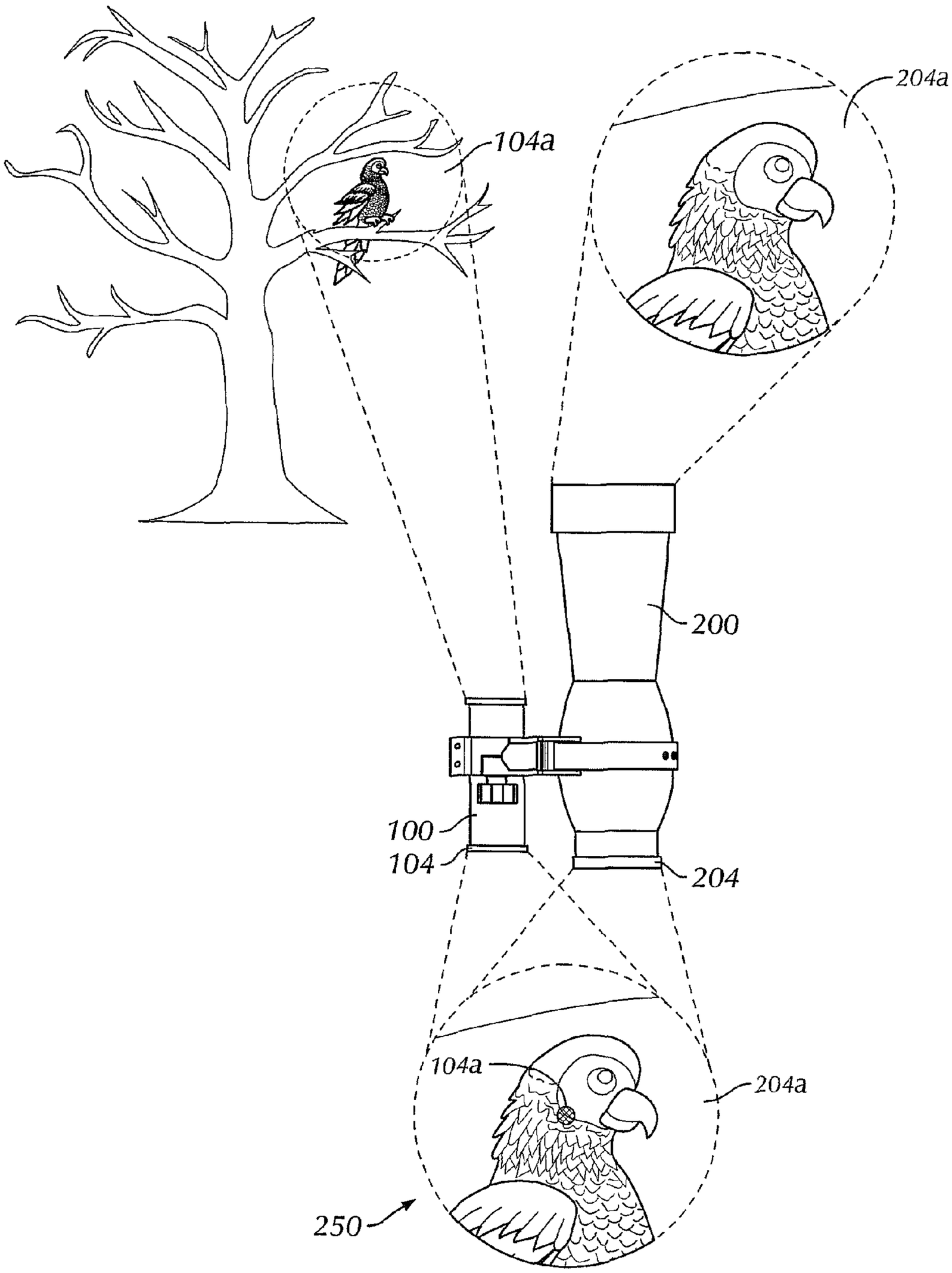


FIG. 18

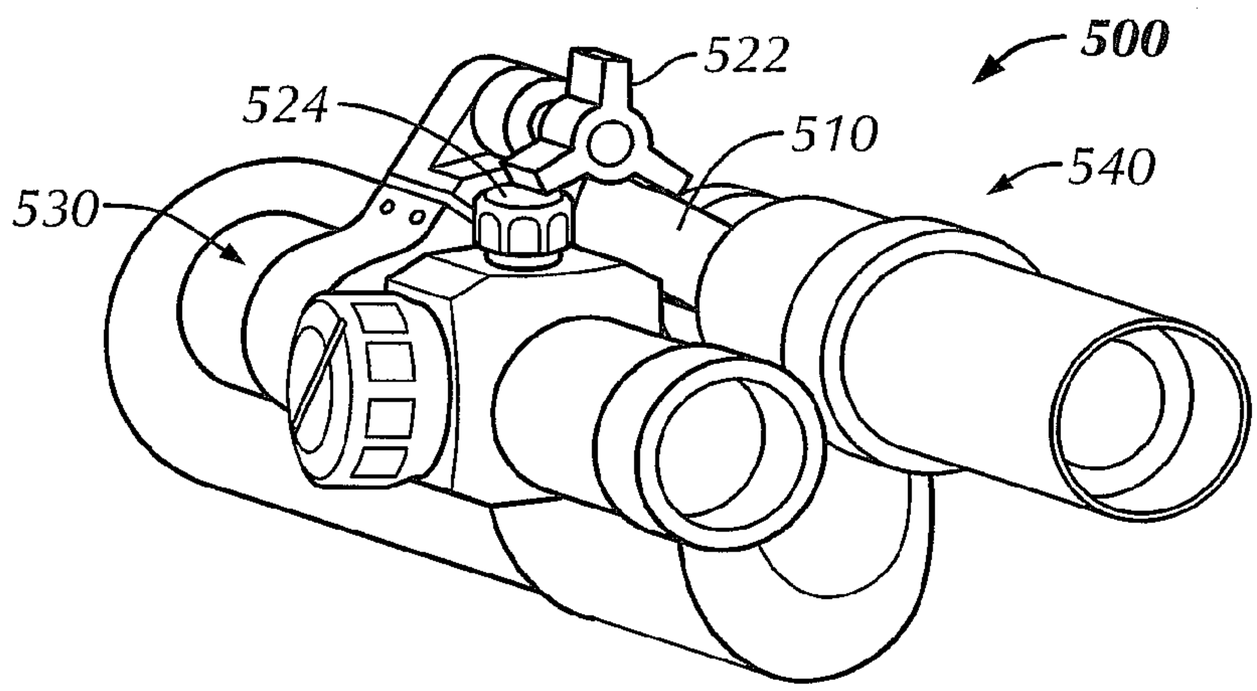


FIG. 19

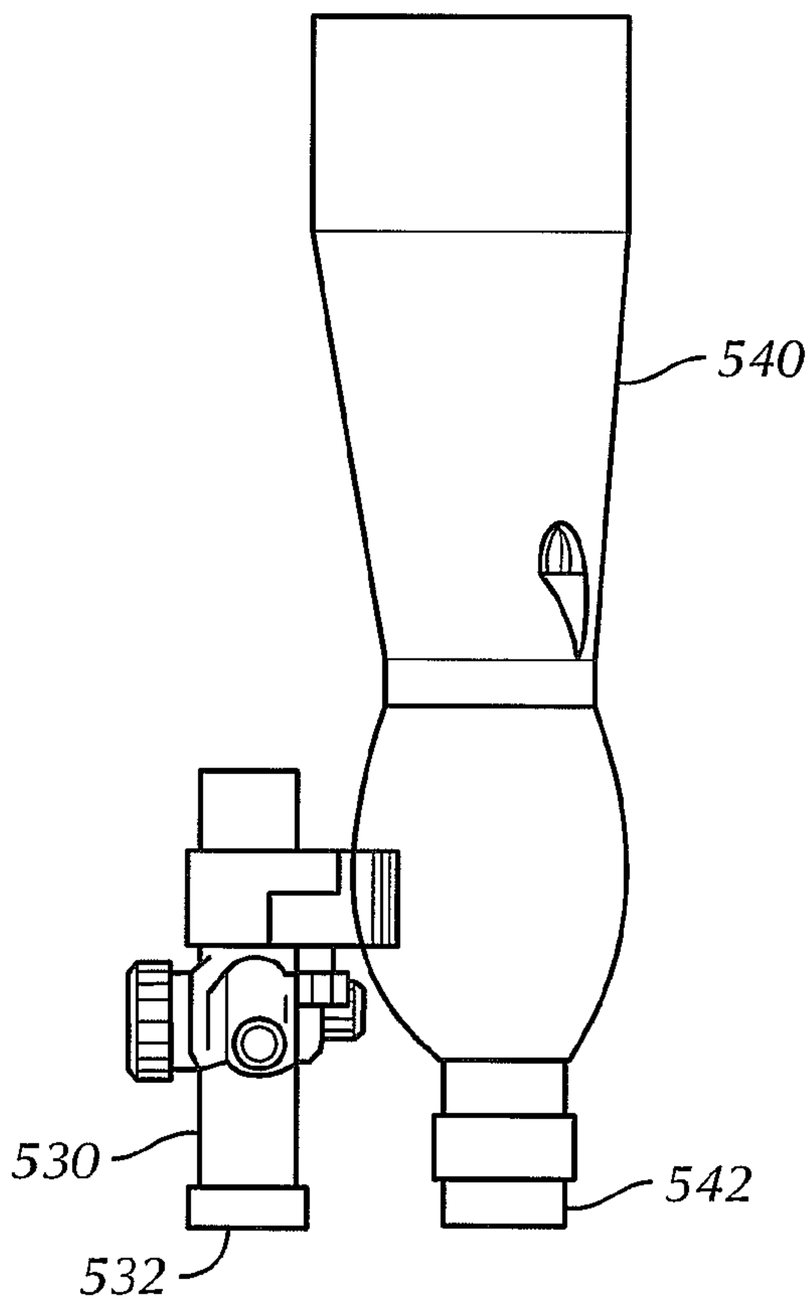


FIG. 20

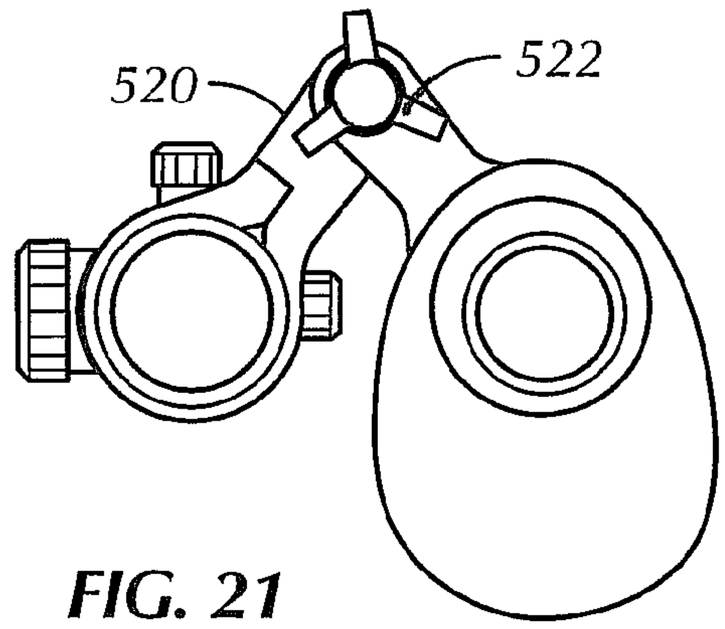


FIG. 21

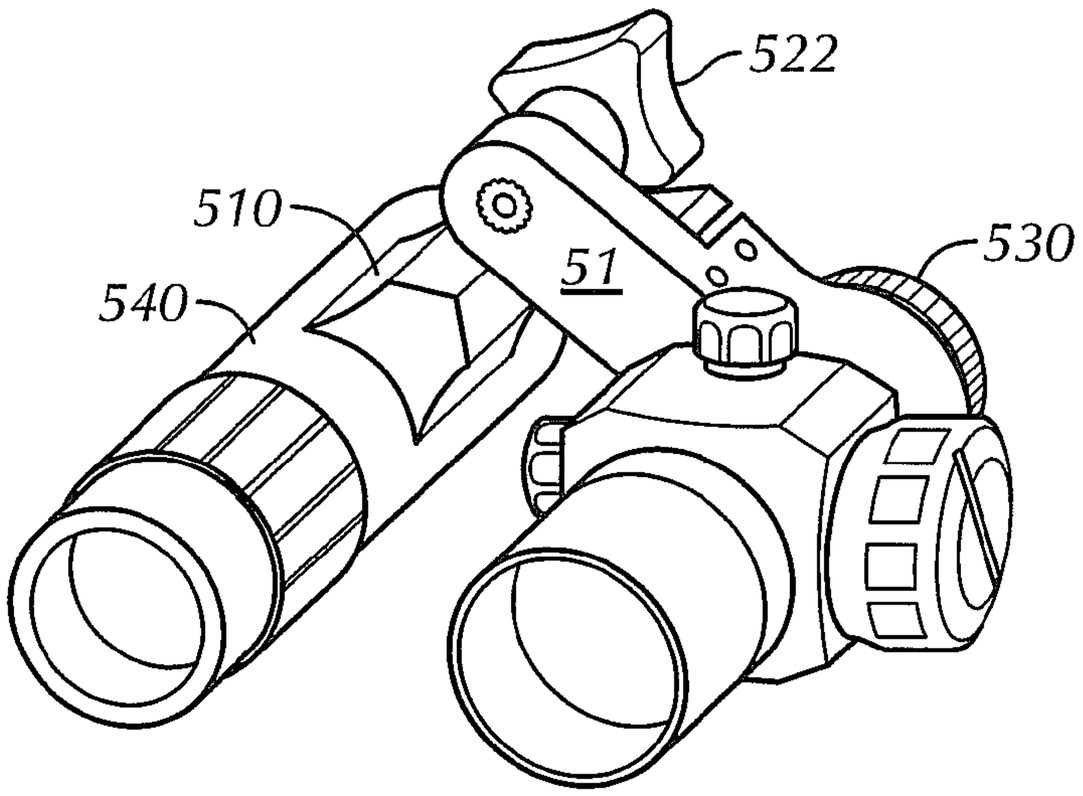


FIG. 22

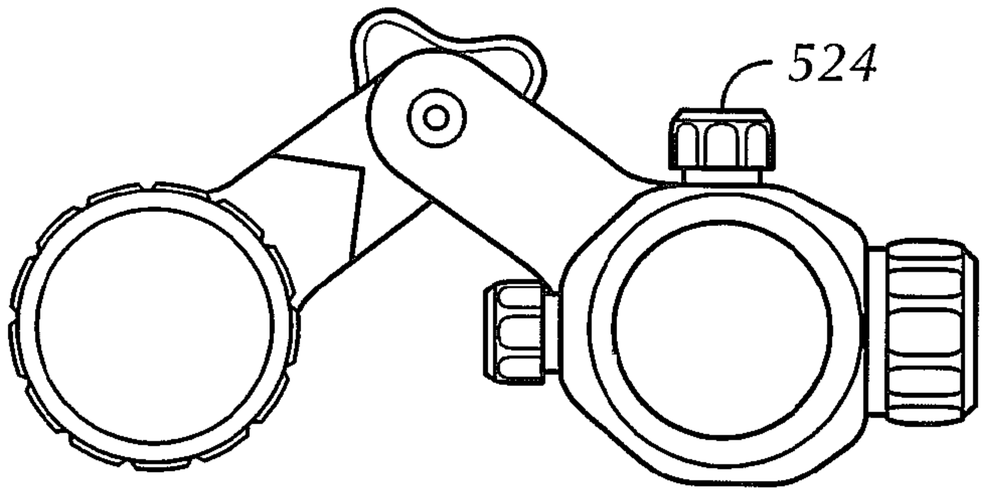


FIG. 23

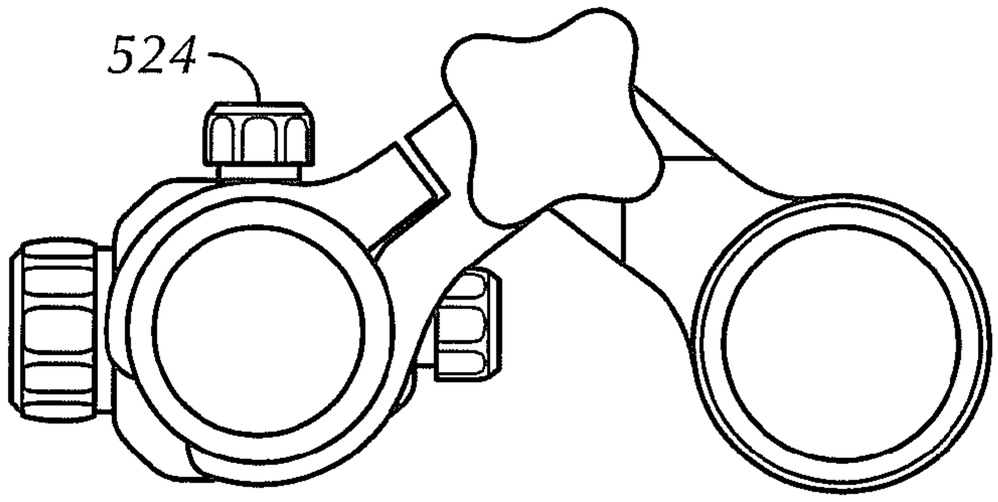


FIG. 24

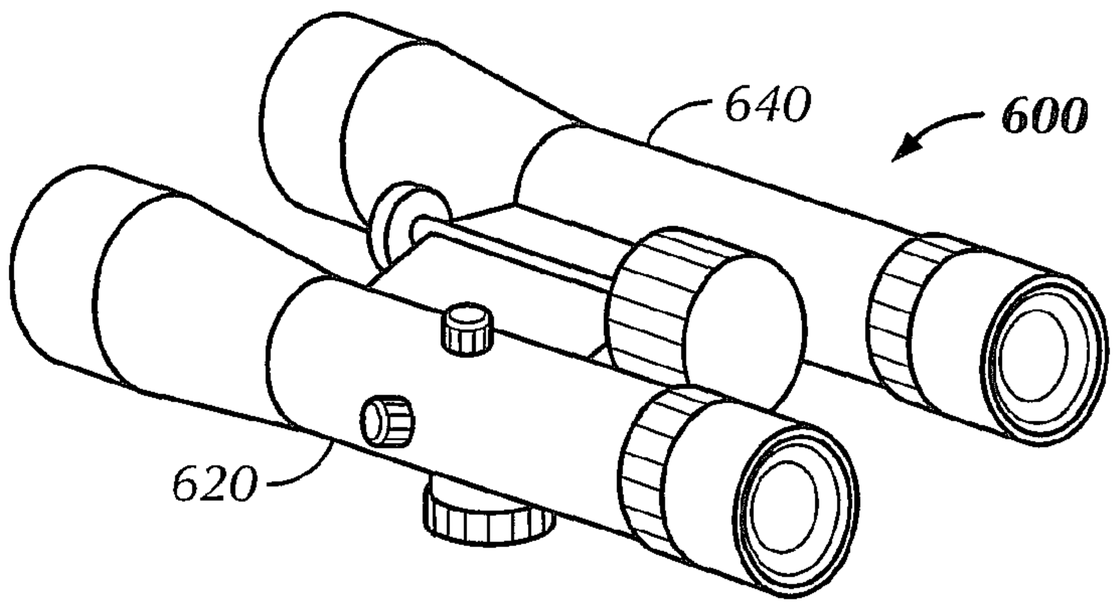


FIG. 25

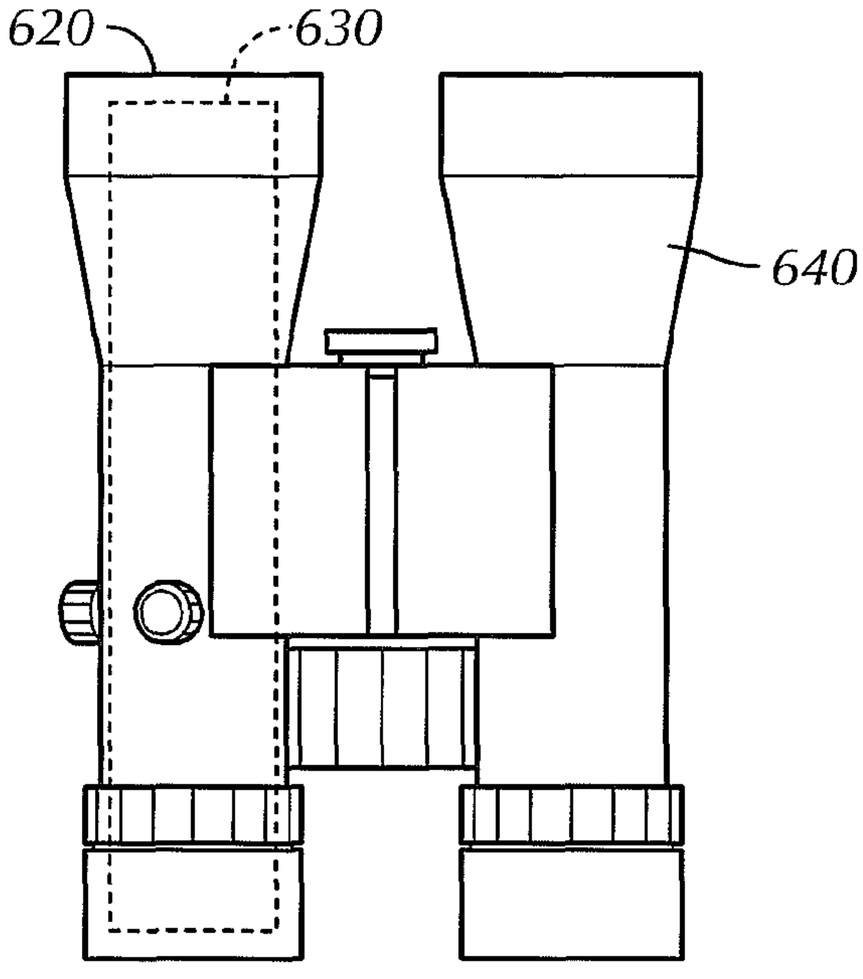


FIG. 26

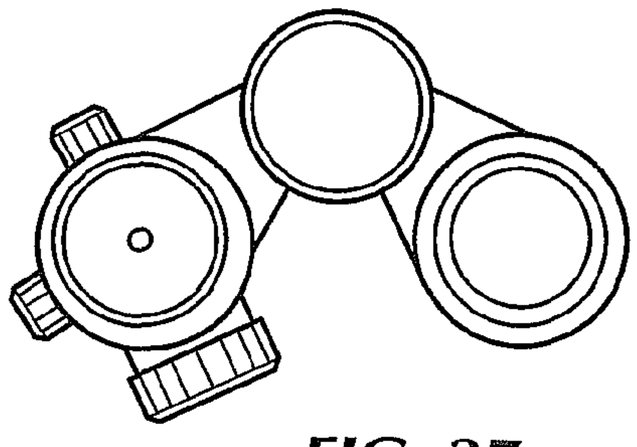


FIG. 27

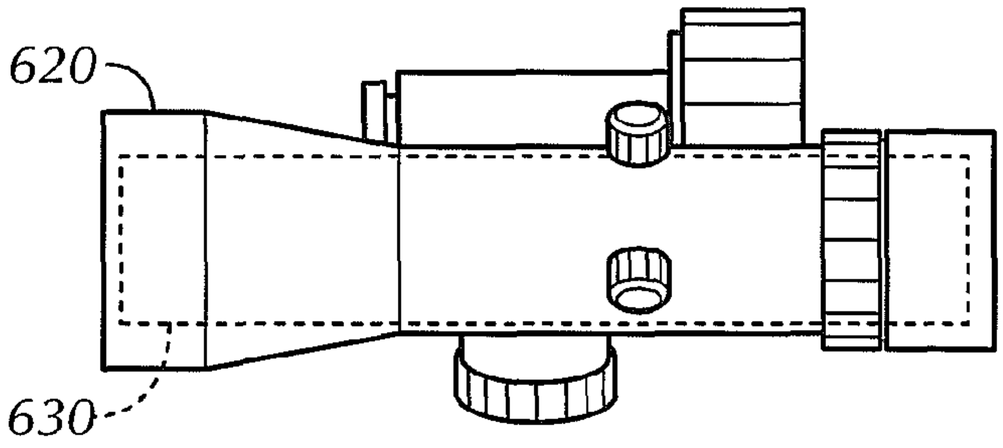


FIG. 28

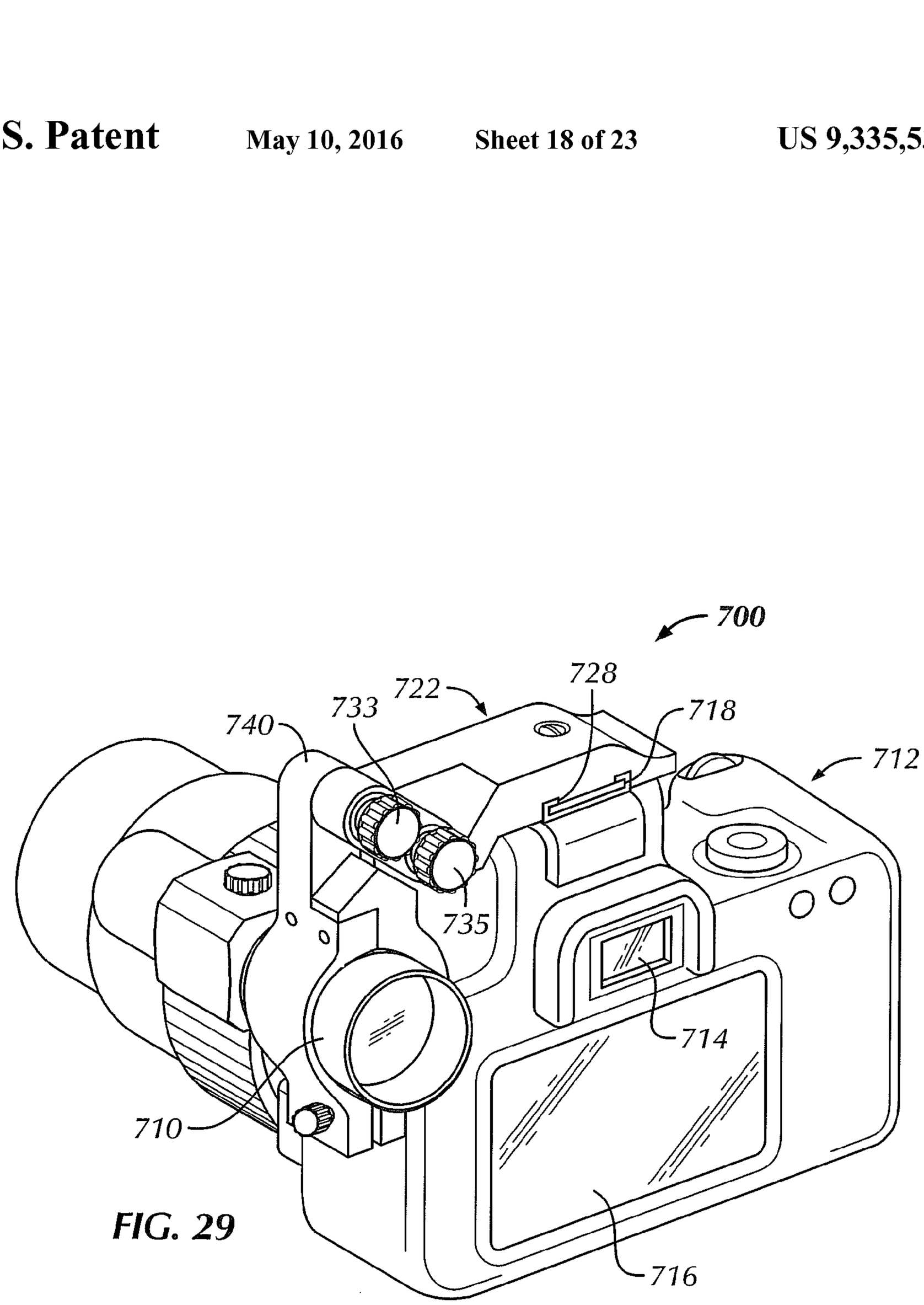


FIG. 29

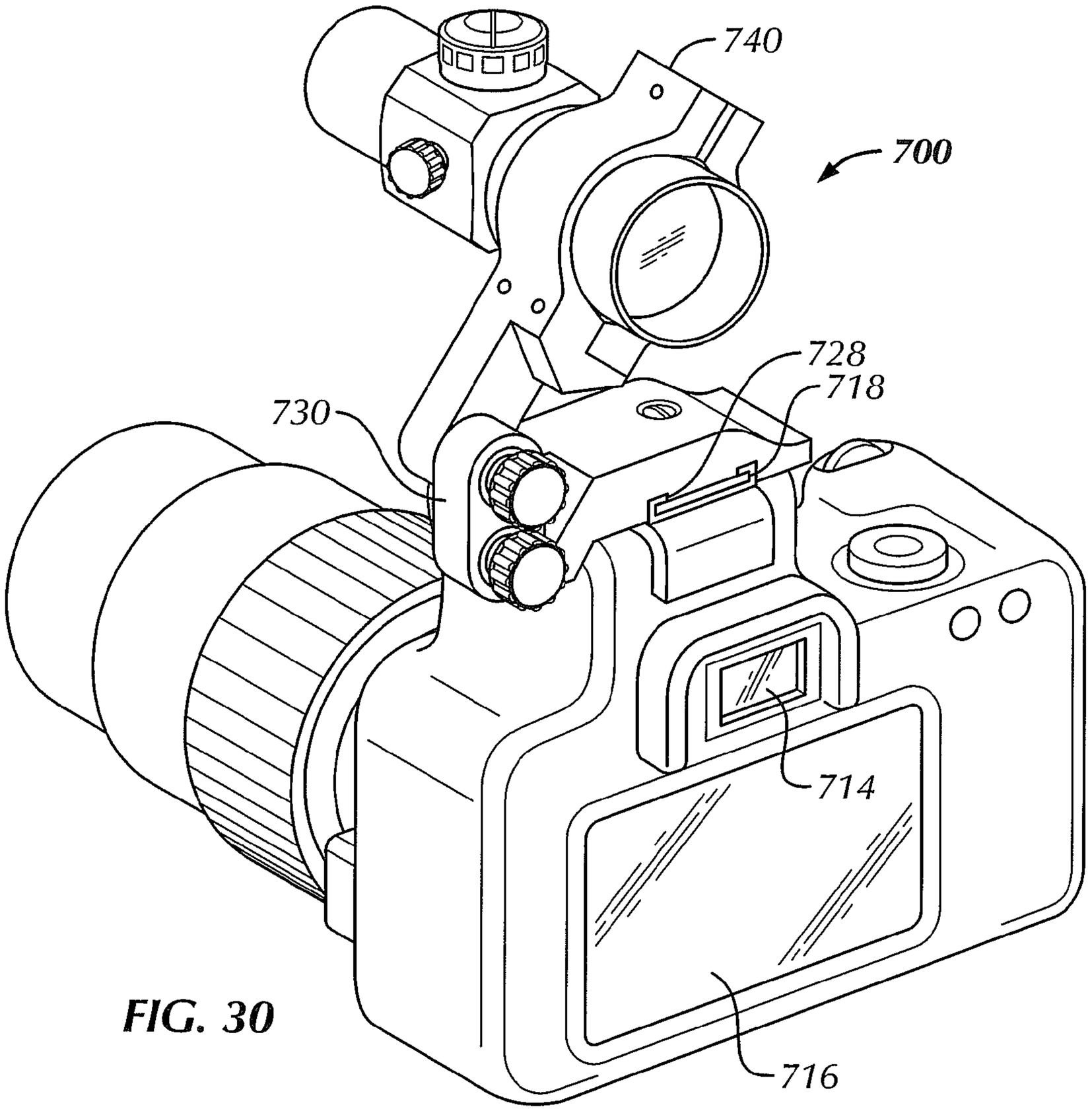


FIG. 30

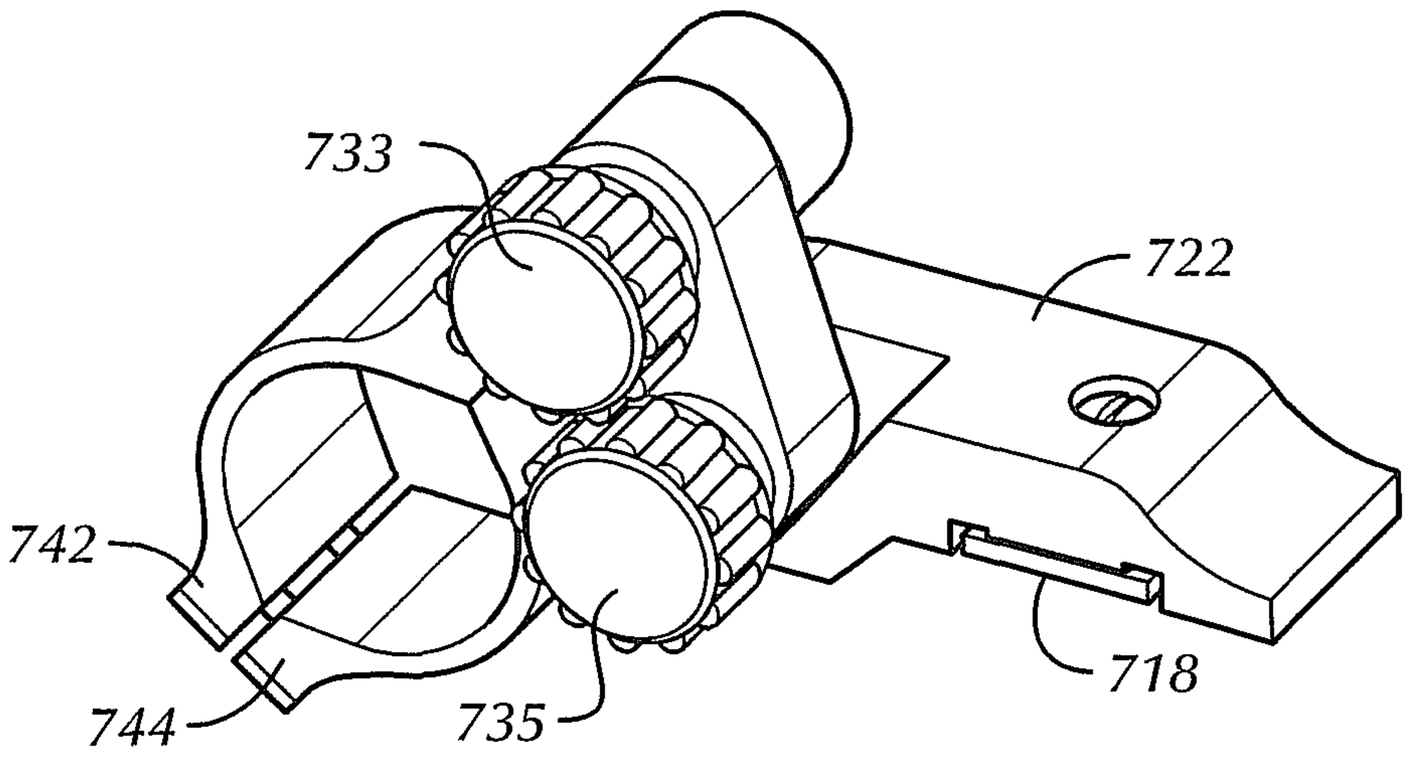


FIG. 31

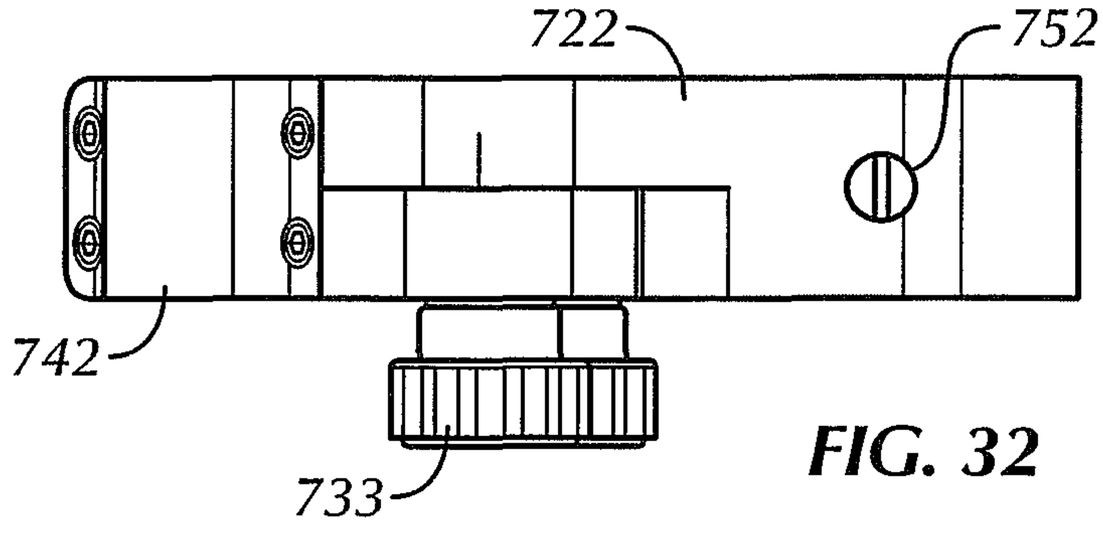


FIG. 32

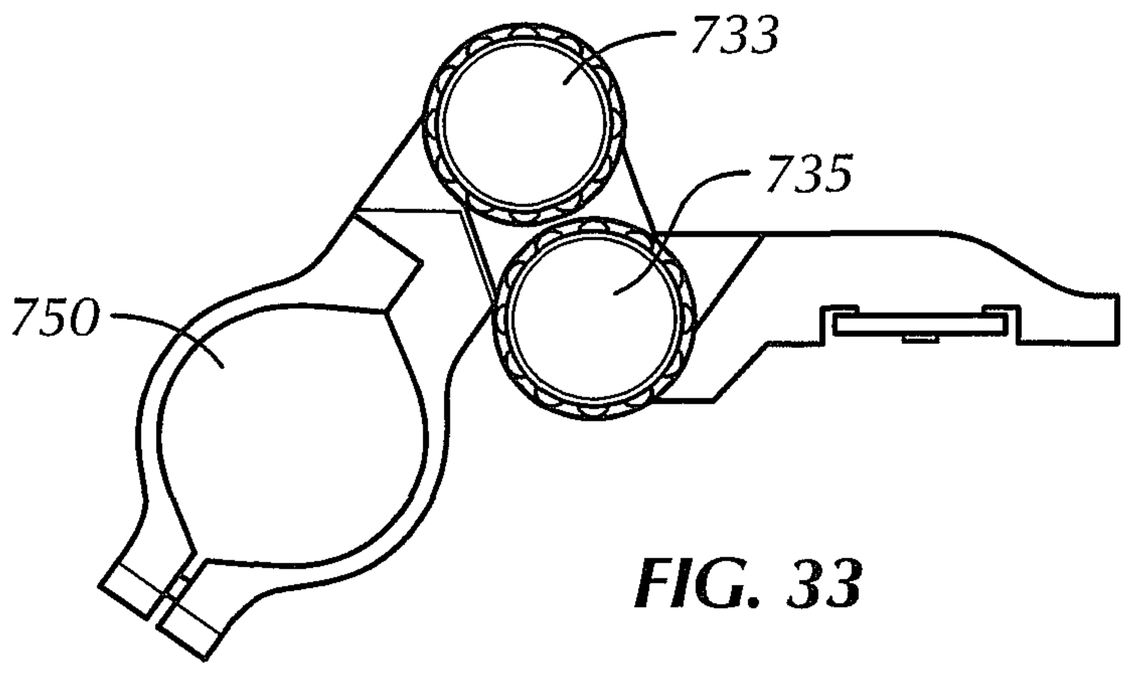


FIG. 33

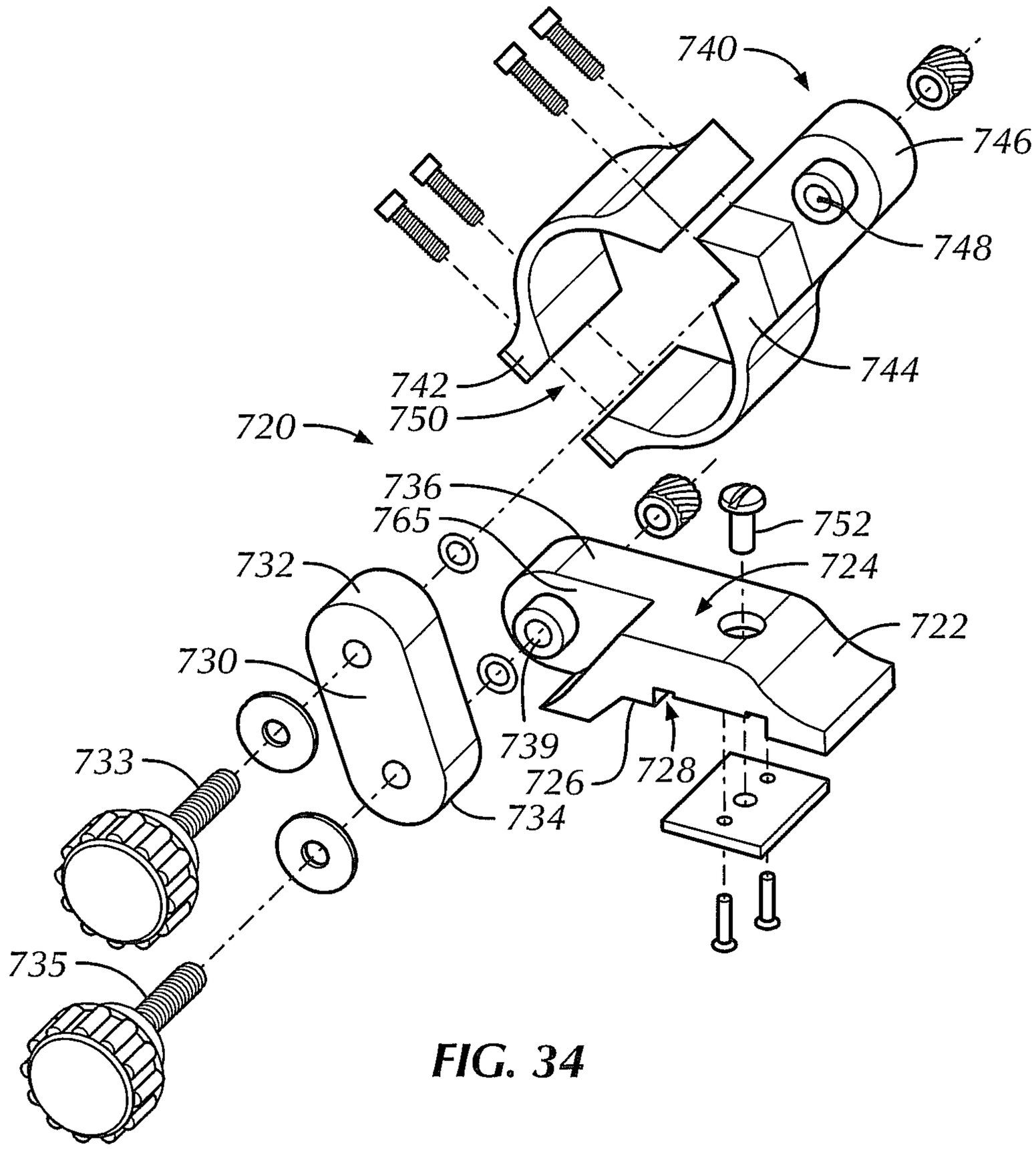

740
746
748
744
742
750
720
736
765
752
732
724
722
730
739
726
728
733
734
735

FIG. 34

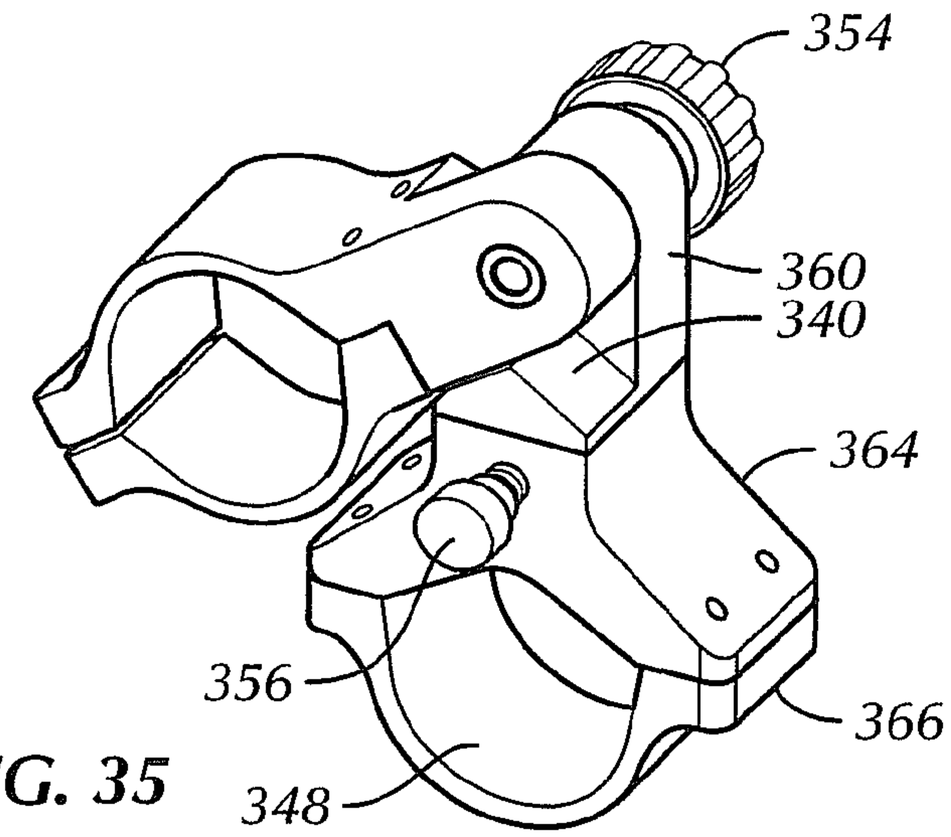


FIG. 35

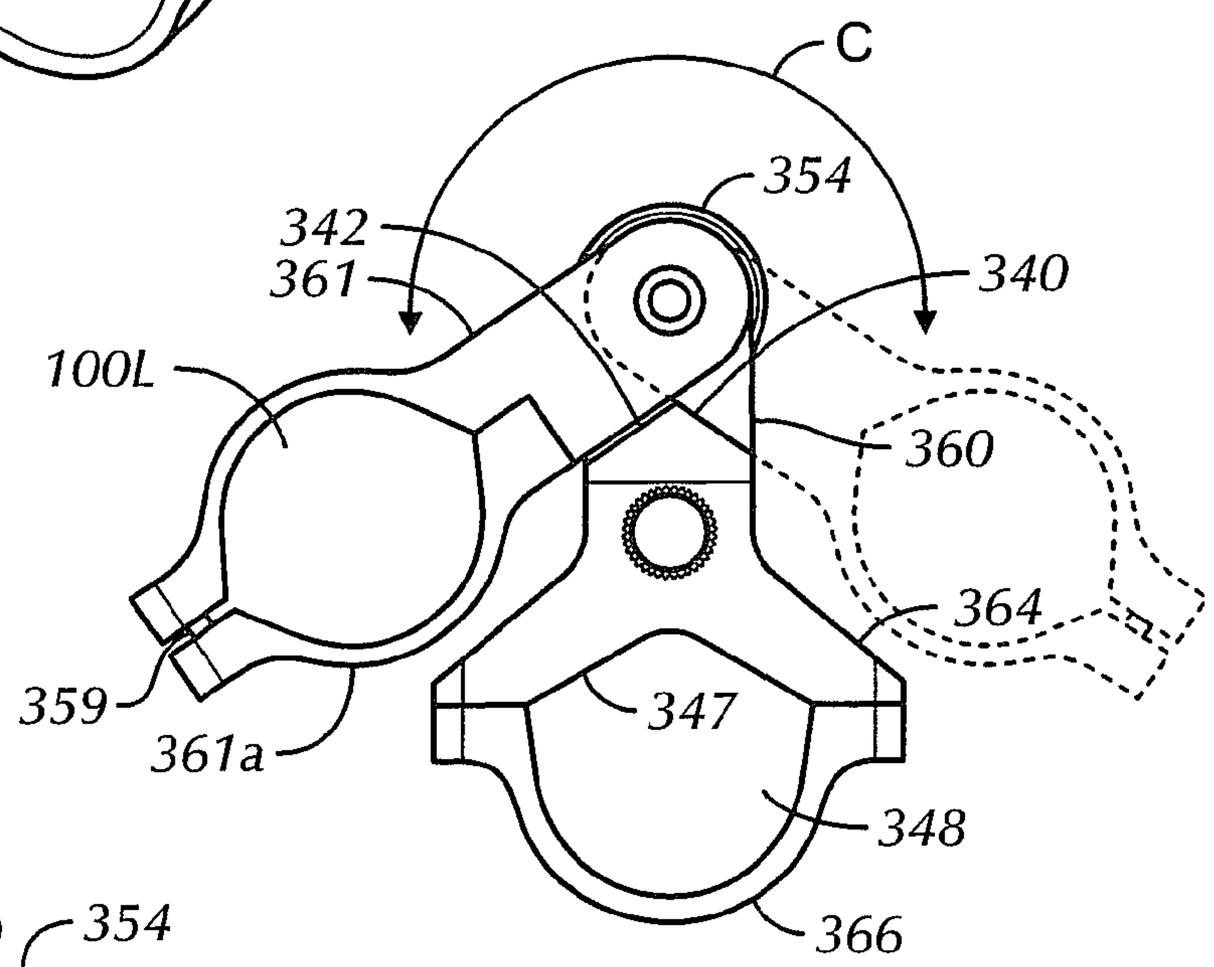


FIG. 36

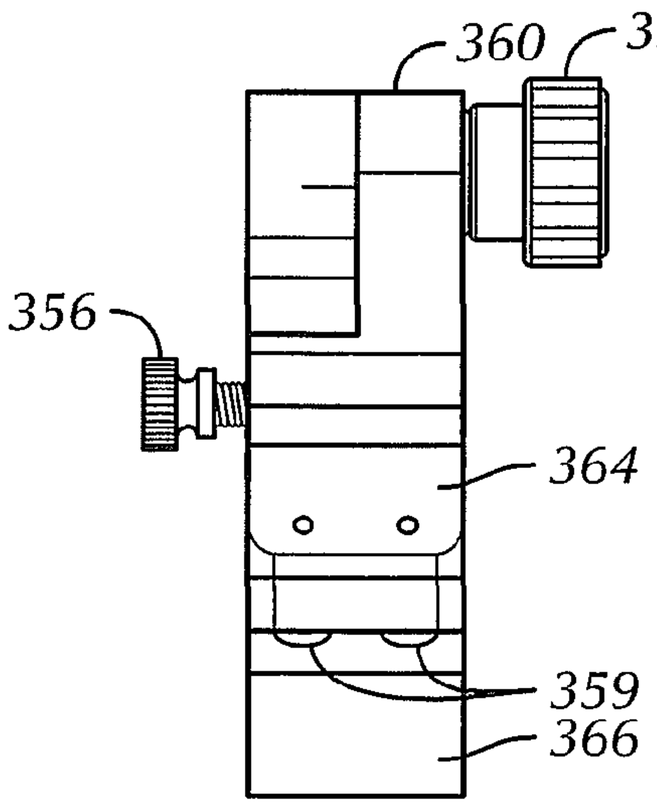


FIG. 37

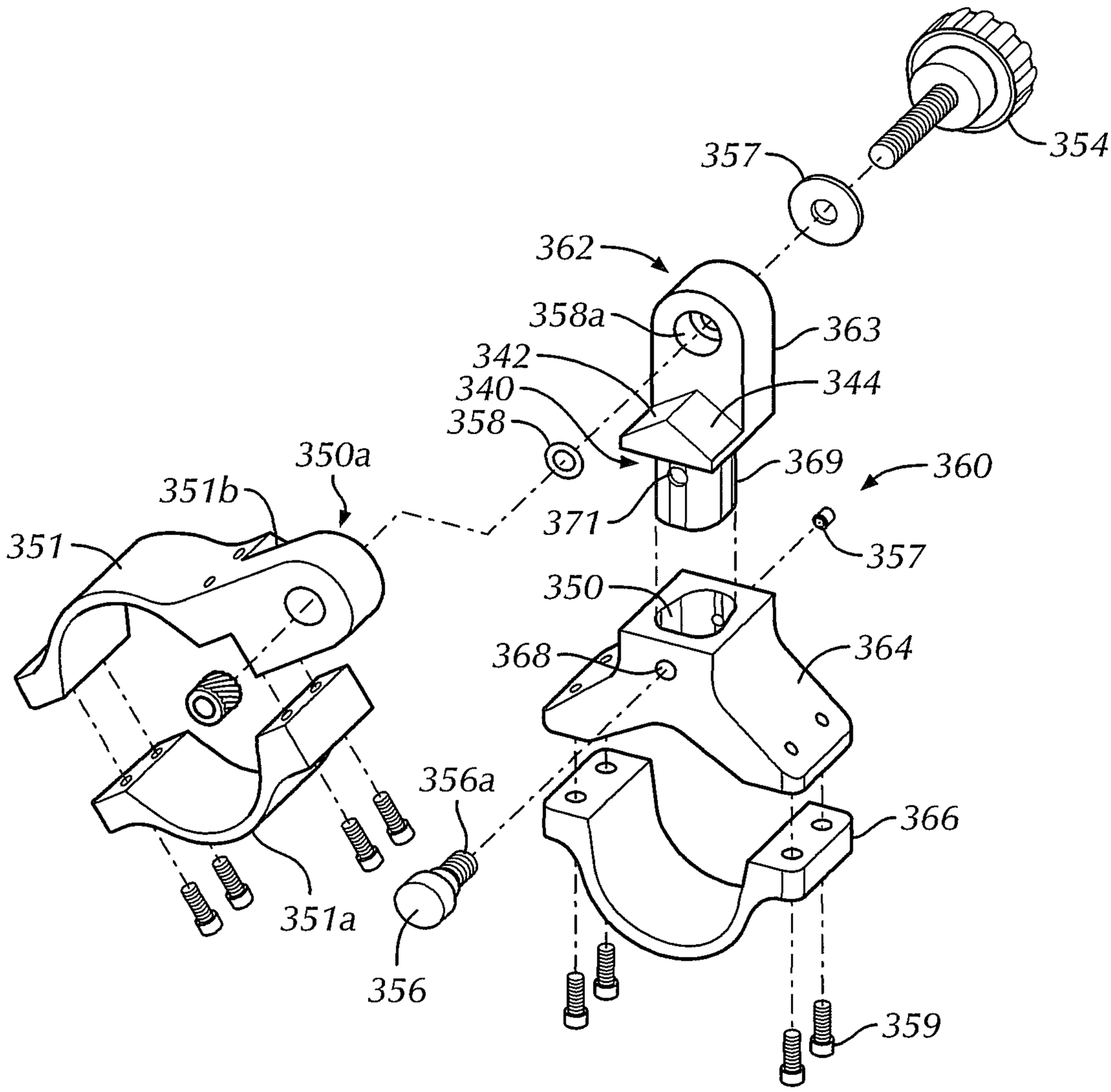

354
357
362
358a
363
342
344
340
358
350a
369
360
351b
371
351
357
350
368
364
356a
366
351a
356
359

FIG. 38

VISUAL TARGET ACQUISITION SCOPE SYSTEM

REFERENCE TO RELATED APPLICATION

This application is a Continuation-In-Part of currently pending U.S. application Ser. No. 13/134,918 filed Jun. 20, 2011, which claims priority of Provisional application Ser. No. 61/397,926 filed Jun. 18, 2010. The application also claims priority the Provisional application Ser. No. 61/752,406, filed Jan. 14, 2013. All above applications are incorporated herein by reference in their entirety.

FIELD OF THE INVENTION

The present invention relates to the field of optical devices in general, and more particularly it relates to visual target acquisition systems. The invention also relates to a visual target acquisition system for cameras and other optical devices having high power lenses or scopes.

BACKGROUND OF THE INVENTION

It is known that looking through a high power scope at an object often offers a narrow field of view. In fact, an increase in the power, or magnification, results in a decrease, or further narrowing of the field of view. In the field of optics, the power or magnification is the amount of enlargement one uses over what the naked eye sees naturally. This is typically expressed in numbers followed by an × sign. Zero magnification is expressed as 1×, double the magnification is 2×, and ten times is 10× and so on.

The difficulty of viewing any object through a camera with high power lenses or scopes comes in various forms. One difficulty is in finding the object and viewing it. This process is also known as "target acquisition". Another difficulty is in maintaining a target in the field of view for the duration of the viewing period or as long as needed by a photographer.

Most photographs are taken using regular lenses such as 35 mm to 70 mm, 50 mm being the lens that best copies what our eyes see. To find a visual target in the viewfinder of a camera, using those lenses, does not present a difficulty. Even going up to a 150 mm lens, considered the first level of telephoto lenses, might be easy enough for most people.

However, in using lens's focal lengths into the 400 mm, 600 mm, 1200 mm and higher, presents a serious problem in acquiring the visual target. The reason is that going up in focal length therefore magnification, reduced or narrows the field of view. The higher the power, the narrower the field of view or the part the photographer sees in the viewfinder or the window of a photographic camera.

The holographic scopes with zero magnification are gaining in popularity. Such scopes are similar to the red dot scopes in that they also have other marks or shape such a small circle or a small cross in addition to a dot. Many holographic scopes do not use batteries as a power source.

Thus, it has been a need for a definitive, simple, compact, economical and universal visual target acquisition system associated with photographic cameras. There is also a need for a system which facilitates a user in finding a visual target in a viewfinder/window of a camera equipped with a telephoto lens and utilizing holographic scopes with zero magnification.

SUMMARY OF THE INVENTION

The present invention provides a rapid visual target acquisition by means of a system which comprises a red dot or holographic type scope with zero (1×) magnification and a high power scope, such as for example, a scope of a photographic camera. The system of the invention brings together a 1× power scope with a high power scope in a particular novel way. Since a 1× scope provides the widest possible field of view, it allows for the rapid locating of any target with one eye. Combining with the scope of the camera simultaneously provides the other eye with a magnified view of a target which is being photographed.

Once both scopes are combined by the target acquisition arrangement of the invention and the distance between the scopes is set to accommodate the viewer's Interpupillary Distance (IPD), it is a simple matter of placing the red or holographic dot on a target and immediately viewing the target. After a few moments a human brain focuses on viewing through the camera side. If the target moves, the brain shifts some of its focus from the camera side to the red or holographic dot and the target is reacquired immediately and without conscious effort

The design and precise execution of the assembly of the invention results in the automatic optical plane alignment of the 1× red dot or holographic scope and the camera scope, thereby reducing the need for multiple adjustments. The red or holographic dot in the 1× scope superimposes a centered point of reference in the field of view. This not only aids in acquiring any target rapidly, it also eliminates the need for constant adjustments as the distance to a target changes.

The system of the invention is capable of adjusting the distance between the scopes to match the unique Interpupillary Distance (IPD) of any user. The viewer uses both eyes simultaneously, in a comfort, to find and view any target.

The present invention provides a rapid visual target acquisition by means of a system which comprises a red dot or holographic type scope with zero (1×) magnification and a photographic camera or a high power optical tube scope. The system of the invention brings together a 1× power scope with a high power scope in a particular novel way in parallel. Since a 1× scope provides the widest possible field of view, it allows for the rapid locating of any target with one eye. The holographic mark or the red dot provides for an artificial point of reference that aids in focusing on the target. Combining that with a photographic camera or a high power scope, simultaneously provides the other eye with a magnified view of that target

The idea is that one only needs to adjust the distance between the two sides to match the distance of the viewer's IPD. The way the two sides are bridged assures that the distance from the pivot point is exactly the same to the center of the, zero magnification and high magnification eyepieces.

According to one aspect of the invention a zero magnification having the widest possible field of view, holographic or red dot scope, for a point of reference, is attached to the camera so as to be used in combination with its lens system. There is only the need to adjust the distance from the zero magnification scope to the viewfinder to match the distance between the photographer's eyes. Since the eyes work in parallel, when the photographer keeps both eyes open, places the holographic mark or the red dot on the visual target, it simultaneously appears magnified in the view finder/window and the picture is taken.

The advantages of the system of the invention are even greater for photographers trying to make pictures of moving targets such as life in the wild, birds in the sky or sporting events. Because looking through the holographic or red dot scope, where the field of view is the same as the naked eye, it is easy to find and even follow a moving target. Placing the holographic mark or the red dot on the target viewing it with

one eye and keeping it on the target is easy and intuitive. The other eye gets to view the target magnified simultaneously effortlessly.

BRIEF DESCRIPTION OF THE DRAWINGS

Exemplary embodiments of the invention will be now described in greater detail herein below with reference to the accompanying drawings, in which:

FIG. **1** is a perspective view of the pivot embodiment of the system on the invention showing a spotting scope on a right side and a red dot scope on a left side;

FIG. **2** is a perspective view of the pivot assembly (without the spotting and red dot scopes);

FIG. **3** is a top plan view thereof;

FIG. **4** is a rear elevational view thereof;

FIG. **5** is an exploded perspective view thereof;

FIG. **6** is a perspective view of the pivot assembly having T-shaped configuration;

FIG. **7** is a rear elevational view of the T-shaped pivot arrangement;

FIG. **8** is an exploded view thereof;

FIG. **9** is a perspective view of the pivot assembly mounted on a Long Rifle scope with a red dot scope attached;

FIG. **10** is a perspective view of the pivot assembly with the riflescope and red dot scope removed;

FIG. **11** is a rear elevational view thereof;

FIG. **12** is a side elevational view thereof;

FIG. **13** is an exploded perspective view thereof;

FIG. **14** is a perspective view of a tactical rifle embodiment of the pivot assembly;

FIG. **15** is an exploded perspective view thereof;

FIGS. **16** and **17** are elevational rear views thereof;

FIG. **18** is a schematic depiction of the principles of the invention.

FIG. **19** is a perspective view of a system formed by a zero magnification, holographic or red dot scope attached to a large spotting scope;

FIG. **20** is a top view thereof;

FIG. **21'** is a rear or end view of thereof;

FIG. **22** is a perspective view of a small scope setup;

FIG. **23** is a front view of thereof;

FIG. **24** is a rear view thereof;

FIG. **25** is a perspective view of a binocular system according to another embodiment of the invention;

FIG. **26** is a top view of thereof;

FIG. **27** is a rear view thereof;

FIG. **28** is a left side view thereof;

FIG. **29** is a perspective view of a further embodiment of the invention, which is a system with a camera set up for horizontal photography;

FIG. **30** is a perspective view of the system with the camera set up for vertical photography;

FIG. **31** is a perspective view of the attachment forming a part of the system;

FIG. **32** is a top view thereof;

FIG. **33** is a front view thereof;

FIG. **34** is an exploded view of the attachment forming a part of the system;

FIG. **35** is a perspective view of a modified embodiment of a pivot assembly with the riflescope and red holographic dot scope removed;

FIG. **36** is a rear elevational view thereof;

FIG. **37** is a side elevational view thereof;

FIG. **38** is an exploded perspective view thereof;

It should be noted that in the drawings and description of the application, right eye dominance is assumed. However, the system of the invention can be easily reconfigured accommodate a person with left eye dominance.

DETAILED DESCRIPTION OF THE INVENTION

FIGS. **1-5**, illustrate one embodiment of the system of the invention having a pivot-type visual target acquisition scope arrangement. The arrangement comprises a target acquisition assembly **10** with the universal base **50** and the clamp pivot **51** adjustably combining/connecting a zero magnification scope or a red dot scope **100** to a power scope or a spotting scope **200**.

A universal base **50** is associated with a prism housing section **205** of the spotting scope **200**. The position of where the base is placed, fore or aft, determined according to configuration of the individual spotting scope and red dot scope. It is essential that both eyepieces **104** and **204** are disposed within the same plane and at an approximate even distance from the viewer's eyes when placed against the scopes in a face on position, not turned sideways.

The universal base **50** is secured to the spotting scope **200** by a flexible member or strap **55** and a strap lock **56**. The length of the flexible member **55** depends on an outer perimeter of the individual spotting scope at a respective area of prism section **205**. In one embodiment, the flexible member or strap **55** is secured with multiple fasteners **59***b* at one side of the universal base **50**. The lock **56** is secured by any conventional means including fasteners **59***a* to a side of the universal base **50** opposite to that receiving the strap. The flexible member or strap **55** surrounds and tightens the spotting scope **200** down, and enters the lock **56** with the strap lock lever **56***a* being in an unlocked position. In FIGS. **2**, **4** and **5** in the unlocked position the lever **56***a* points up. When strap **55** is tightened, so as to lock the spotting scope **200** and the strap lock level **56***a* is lowered within the assembly (see FIG. **1**). Thus, the universal base **50**, therefore the entire assembly is secured. In an alternate embodiment, upon the viewer/user concluding that the position of the universal base **50** is firmly established, the assembly can be made permanent. This eliminates the need for the strap **55** and the strap lock **56**. Such permanent structure can be formed by securing the universal base **50** to the spotting scope **200** in any conventional manner.

Formation of the system of the invention is illustrated in FIGS. **1**, **2**, **4** and **5** showing how the zero magnification or red dot scope **100** is inserted and secured within the pivot assembly, between a clamp pivot **51** and a clamp saddle **51***a*. In the preferred embodiment this can be accomplished by loosening fasteners **59** and inserting the red dot scope from behind into a space **100**L (see FIG. **4**, for example). When the red dot scope **100** is installed in the desired position, the clamp saddle **51***a* is then secured by tightening the fasteners **59**.

The embodiment of FIGS. **1-5** the universal base **50** is positioned on top of the high power or spotting scope **200**. The arc-shaped portion **49** formed at the bottom part of the base **50** receives and accommodates the exterior of a great variety of scopes. In this manner, the universal base **50** of this embodiment can be positioned in a very stable way on a great variety of individual scopes. The flexible element or band **55** cooperates with the universal base **50** and the locking mechanism **56**, so as to surround the spotting or high powered scope **200**. The combination of clamp pivot **51** and clamp saddle **51***a* defining the receiving space **100**L accommodates an exterior of practically any conventional red dot scope. The pivot arrangement allows adjustment of the system of the invention to practically any distance between human pupils. In this manner, the invention covers a great range of distances from the narrowest distance between eyes to the widest.

In the preferred embodiment, the universal base **50** and the clamp pivot **51** assembly are put together in the following manner. Initially, a spacer **57** is inserted over the adjustment locking knob's **54** engaging area **54***a*. Then the adjustment locking knob **54** is inserted into the hole at the top of the universal base **50**. After that, a lock spacer **58** is inserted over the engaging area **54***a* of the adjustment locking knob **54** and into a bore **58***a* in same universal base **50**. Finely, the clamp pivot **51** is brought together with universal base **50** when the boss **50***a*, at the top of the clamp pivot **51**, is inserted into the bore **58***a*, at the top of the universal base **50**. The process is finalized by the adjustment locking knob **54** being positioned into a tightening member **53**, and then tightened.

The tolerances of the inner wall and the depth of the counter bore **58***a* in the universal base **50** and the outer wall and the height of boss **50***a* are similar to that of the pivot design assembly having a very snug fit without fully tightening the adjustment locking knob **54**. When the adjustment-locking member **54** is fully tightened, the flat surface below and around the boss **50***a* comes into a contact with the flat outside surface around the counter bore **58***a*. In addition, the boss **50***a* simultaneously flattens the lock spacer **58** inside the counter bore **58***a* in the universal base **50** for a very positive lock.

When a slight adjustment in the pivot design assembly is needed, it takes only a limited adjustment of the adjustment-locking member **54**. This loosens the positive lock by springing the lock spacer **58** from its flat position, yet keeping the universal base **50** and the clamp pivot **51** very snug. In this manner there is no wobbling when adjustments are made. As soon as the desired adjustment IPD is achieved, the adjustment locking member **54** is turned and the assembly is secured in its new setting.

In operation of the system, initially the pivot assembly is loosely positioned on the spotting scope **200** (see FIG. **1**). Then, the adjustment-locking member **54** having an engaging section **54***a* can be slightly loosened. Adjustable connection between a zero magnification scope viewed by a first eye of a user and a power scope viewed by a second eye of the user, the system comprising:

If the two eyepieces, **104** and **204** are not on a horizontal plane or their optical axes are not parallel to each other, the universal base **50** will then be moved as illustrated by the arrows in FIG. **4**, until a horizontal plane is achieved. If, at that point, the distance between the eye pieces **104** and **204** changed, the clamp pivot **51** will also be moved up or down accordingly. Even if the IPD's exact measurement is not known, the same procedure will be followed by simply looking through the eyepieces **104** and **204**, as the universal base **50** and the clamp pivot **51** are being adjusted until the viewer gets a visual and/or mental indication that the optimal IPD has been achieved. At this point the adjustment locking knob **54** and the strap lock **56** are tightened. Index lines visible on top of the universal base **51** and a corresponding index line (1) FIGS. **2**, **3**, and **5**, can be provided so as to provide the viewer a reference for quick setting up in the future.

Although, the embodiment of FIGS. **1-5** have been described with reference to a particular design of the universal base **50** and the clamp pivot **51** including the clamp saddle **51***a*, it should be obvious that variations of this embodiment are within the scope of the invention. For example, the lock **56** can be secured to the universal base by any conventional manner, such as for example, gluing, welding, etc. In attaching, the clamp saddle **51***a* to the clamp pivot **51**, any conventional way of accomplishing this task also forms a part of the invention. As an example, the scope **100** can have a standard 25 mm-28 mm inside diameter (ID), 30 mm outside diameter (OD).

Referring now to FIGS. **6**, **7** and **8**, illustrating an embodiment of the system of the invention having a T-shaped pivot arrangement. The red dot scopes having larger inside diameter, and therefore even larger outside diameter, require a different way for attaching same to the universal base **50** of the previously discussed pivot design attachment. That is because many of such scopes are often provided with an integrated rail. Such rail **105** illustrated in FIGS. **6** and **7**, is formed as part of the zero magnification, red dot scope tube. This makes it very difficult to use the clamp pivot **51** and the clamp saddle **51***a* of the previously discussed pivot design assembly to mount such a scope. In the embodiment of FIGS. **6-8** a T-shaped pivot **152** and the T-shaped pivot rail **152**R are provided to accommodate the integrated rails **105**.

As depicted in FIG. **6**, the universal base **150** and the related parts, other than the T-shaped pivot **152** and pivot rail **152***a*, etc. are similar to those illustrated in FIG. **1-5**. Furthermore, since the way the universal base **150** is attached to the spotting scope and the adjustments thereof, have been previously covered in substantial detail, and will not be repeated here.

As illustrated in FIG. **6**, the T-shaped pivot **152** accommodates the large red dot scope **100**Lg. FIG. **8** shows how the T-shaped rail **152**R fits into the notch at the bottom of the T-shaped pivot **152** and is secured with a fastener **152**Ra. The bottom of the T-shaped pivot **52** has been formed to receive the T-shaped pivot rail **152**R. The two parts, **152** and **152**R, are at substantially right angles to each other and are in line with each other. As seen in FIG. **8**, the T-shaped pivot rail **152**R extends on either side of T-shaped pivot **152**. As seen in FIG. **8**, there are multiple openings formed in the rail **152**R. This allows enough flexibility in setting the rail **152**R fore and aft into the T-shaped pivot **152**. This allows the zero magnification or red dot scope with integrated mounting rails **105** to arrange its eyepiece **100**Lg to align with the power or spotting scopes eyepiece **204**.

FIG. **7**, illustrates how the large red dot scope **100**Lg is mounted on the T-shaped pivot rail **152**R. First, the locking fasteners **105**Ln are loosened. This allows the rail clamps **105**C to move away from the integrated rail **105** widening the space between them until the T-shaped pivot rail **152**R fits in between them. Then, by tightening the locking fasteners **105**Ln, the rail clamps **105**C squeeze the T-shaped pivot rail **152**R against the large red dot scope **100**Lg integrated rail **105**, thereby securely mounting the large red dot scope **100**Lg onto the pivot design attachment.

Since position of the rail **105** on the red dot scope is very specific, the arrangement of this embodiment is very precise. This embodiment does not allow a rotational motion of the red dot scope **100**Lg within the bracket. The embodiment assures a longitudinal motion of the red dot scope within the bracket of the T-shaped arrangement and the radial motion of the red dot scope through the pivotal connection. However, the rotational motion of the red dot scope is inhibited.

Because the T-shaped pivot **152** and the previously discussed clamp pivot **51** use the identical universal base, the mounting procedure onto the spotting scope **200** is very similar. In addition, the process of adjusting for the proper IPD is also identical for both. This process has been fully described before and is not repeated here.

Referring now to FIGS. **9-13** illustrating the embodiment of the pivot assembly of the invention adapted to accommodate a standard Long Rifle (LR) as it is mounted on a riflescope **300**. FIG. **9** shows the pivot assembly where the red dot

scope **100** is attached to the riflescope **300** associated with a rifle **400**. FIGS. **10**, **11**, **12** and **13** show the assembly with the rifle and scopes being removed for better clarity.

Referring now to FIG. **9** showing that the riflescope **300** is attached to the rifle via mounting rings **305**, attached to two mounting rings bases **305***a*, which are connected to the rifle **400** fore and aft of the breach area. In one embodiment, the universal base **360** is positioned over the riflescope tube **300** between the rear mounting ring **305** and the scope eyepiece **304**. The location of attaching the universal base **60** to the universal base clamp **366** is based substantially on the following two factors: (1) the availability of an open space on the tube **300***a*; and (2) the location on the tube **300***a* of an adjusting knob **302** controlling fore or aft of the elevation **302** and an adjusting knob **303** controlling the windage. It is essential for the invention that when the red dot scope **100** is mounted on the rifle scope **300**, the respective eyepiece **104** does not go aft of the rifle scope eye piece **304** and interfere with the shooter's preferred eye relief. For the purposes of the invention it is assumed that, the eye relief is the distance from the eye to the first lens in the eyepiece.

Referring now to FIGS. **10**, **11** and **13** illustrating systematic relationships between the scopes **100** and **300**. As the initial step, the bottom of the universal base **360** is first mounted on to the riflescope tube **300***a*. It is then matched with the universal base clamp **366** mounted at the bottom of the rifle scope main tube **300***a* and is secured by fasteners **359**, which enter through universal base clamp **366** into a universal base **360** (see FIG. **13**) and are only snugged in.

Then, the red dot scope **100** is mounted in between the clamp pivot **361** and the clamp saddle **361***a* with the fasteners **359** entering through clamp saddle **361***a* and snuggly engaging the clamp pivot **361** (see FIGS. **10** and **11**) and are only snugged in.

After that the adjustment-locking member **354** having an engaging section **354***a*, is slightly loosened and the spaces between the left space for the red dot scope **100**L and the right space for the riflescope **300**R are set for the IPD of a user. This is accomplished by tilting the clamp pivot **361** up or down as illustrated by the arrows shown in FIG. **11**. Such motion is achieved by using the boss **350***a*, the corresponding bore **358***a* and the engaging section **354***a* of the adjustment member **354** as the pivoting point (see FIG. **13**). When the center of the left space for the red dot scope **100**L, or the red dot scope eyepiece **104** and the center of the right space for the riflescope **300**R, or the riflescope eyepiece **304**, correspond to the individual viewers IPD, the adjustment member **354** is tightened to provide a positive lock.

In view of the interference of the rifle stock cheek rest **402**, in order for the shooter to look through the center of the rifle scope **300**, the head tilts at an angle towards the rifle. This puts the left eye above the right eye. To maintain the ability of the shooter to look through the centers of both scope eyepieces, the universal base **360** should be tilted from a horizontal position to one matching the angle of the head leaning. This is done by using the rifle scope **300** as the pivoting point, as shown by the arrows in FIG. **11**. The process should be accomplished by emanating to the left and right from the universal base **360** until the right eye is looking through the center of the rifle scope eye piece **304** and the left eye is looking through the center of the red dot scope eye piece **104**. When that is achieved, the fasteners **359** attaching the universal base clamp **366** into the universal base **360** can be finally tightened.

The embodiment of FIGS. **9-13**, illustrates installation of the target acquisition assembly of the invention on a rifle. This occurs in such a manner so as to provide a pivotal connection between the red dot scope and the high power scope of the rifle, and to accommodate various designs of the rifle scopes. As illustrated in FIGS. **10** and **11**, an inner area **348** of the base clamp **366** has a u-shaped configuration, whereas the bottom inner area **347** of the universal base **360** has a v-shaped configuration. The combination of the u-shape and v-shape areas in the receiving opening **300**R, enable the invention to accommodate a great variety of the rifle scopes. Since the u-shaped area **348** of the base clamp receives a cylindrical portion of the rifle scope housing, the v-shape area **347** locks the rifle scope housing within the u-shaped seat of the base clamp **366**.

It should be obvious that many variations and modifications of the above-discussed pivot assembly of FIGS. **9-13** are contemplated by the invention. For example, the adjustment member **354** can be substituted by other conventional arrangements controlling the motion between the left and right spaces of the assembly. Furthermore, the universal base clamp **366** can be attached to the universal base **360** by any conventional means. This is also applicable for the assembly of the clamp pivot **351**, etc.

The embodiment illustrated in FIGS. **14-17** is provided to facilitate carrying a rifle with the mounted target acquisition assembly for substantial distances, or when a user is running with the rifle. When the rifle is carried in front, at the side or shouldered, the pivot assembly, as it is mounted on the rifle, might interfere with such applications because of its side protrusion. In the embodiment of FIGS. **14-17** this drawback is minimized through a provision of a quick release mechanism disposed between the bottom of the universal base **60**T and the universal base clamp **66**T on the opposite side of the red dot scope **100** (right side shoulder of universal base **60**T). Certain elements of the present embodiment have been disclosed with reference to the previously discussed tactical pivot assembly and the long rifle pivot assembly and will not be repeated in this part of the application.

As depicted in FIGS. **14** and **15**, to bring the universal base unit together, the universal base clamp **466**T is connected to the universal base **460**T by any conventional means including the fasteners **469**. A spacer **467** is inserted over it and pressed against a shoulder of the universal base **460**T. As depicted in FIGS. **15-17**, the cross dowel **468** is inserted into the openings at a bifurcated bottom area of the cam lever **465** and secured. In one embodiment of the invention fasteners can be used for the securing purposes, so as to be placed into the cross dowel **468** and snugged, while the cam lever is in the down position **465***u*. The cam lever **465** releases and squeezes one side of the universal base **460**T. The securing members **469** are snugged into the bottom of the universal base **460**T. The fasteners **459***b* attaching the other side of the universal clamp **466**T to the universal base **460**T, remain tight during the entire process.

FIG. **16** illustrates how the cam lever **465** upon being lowered to position **465***u* allows the entire pivot assembly **640**T to be tilted. To accomplish this task, the rifle scope main tube **300***a*/**300**R is used as a fulcrum/pivot to where the red dot scope **100** is placed directly above the rifle scope **300**. That position is then secured by raising the cam lever **465** from the position **465***u* to the position where the cam lever **465** touches the top of the universal base **460**T, which tightens the universal base clap **466**T against the universal base **460**T. As depicted in FIG. **17**, if there is a need for close quarters quick shot, the red dot scope **100** can be used to take that shot because the scopes are still in parallel alignment. When the need to return to the sniper mode arises, the process is reversed from FIG. **17** to FIG. **16**. In this manner, the cam lever **465** is lowered, the universal base **460**T, and therefore the assembly, is pivoted back to the left to its optimal IPD

position. The lever is raised to lock it after the adjustment is complete. These adjustments are rather fast and take no more than a second or two.

As discussed above, when a user is walking or running with a rifle along his or her side, or when shouldering the rifle, the red dot arrangement often interfere with a body of the user. The arrangement of the embodiment of FIGS. **14-17** allows alignment of the scopes in a straight horizontal plain with the rifle. Thus, the scopes are positioned flat against the body or against the back when shouldered. The above-discussed quick release mechanism is provided to facilitate quick angle and/or radial adjustment of the entire target acquisition system, so that the red dot scope **100**L is adjusted with respect to the high power scope **300**R of the rifle. This mechanism provides fast adjustment to practically any desired position of the red dot scope **100**L with respect to the high power rifle scope **300**R. The adjustment includes a rotational motion of the assembly, including the red dot scope with respect to the longitudinal or optical axis of the rifle scope. Various radial positions of the red dot scope **100**L are achieved by simply releasing and locking the cam lever **65** and the respective cam mechanism.

Referring now to FIG. **18** illustrating principles of the invention. The left eye of a user is looking through the eyepiece **304** of the zero magnification or red dot or holographic scope **300** and finds an object such as a bird for example. The right eye is simultaneously looking through the eyepiece **404** of the high power scope **420**. The result is the immediate viewing of the magnified view **404**A of the bird object. The longer the viewer looks at the magnified view, the less he/she notices the red dot or holographic. At the moment the bird flies away, the brain of the user shifts some of its focus from the magnified view to the reemerging red dot or holographic in the wide field of view of the red dot or holographic eye piece **304**. The result is that the target does not disappear from the magnified view.

It is illustrated in FIG. **18** that looking with the left eye through the zero magnification or the red dot or holographic scope **300** the user acquires a wide field view **304**A and sees a large area around the bird object. On the other hand, the right eye looking through the high power scope **420** acquires an enlarged view **304**A of the bird object. The right eye has a much narrower field of view **404**A and only sees a part of the object, such as for example a head of the bird. The resulted view **350** is the combination of the zero magnification of the red dot or holographic view **304***a* and the magnified view **404***a* provided by the system of the invention.

Referring now to FIGS. **19-24**, which illustrate a further embodiment of the system of the invention having a pivot-type visual target acquisition scope arrangement. The arrangement comprises a target acquisition assembly **500** with the universal base **510** and the clamp pivot **520** adjustably combining/connecting a zero magnification, red dot or holographic scope **530** to a power scope or a spotting scope **540**.

A universal base **510** is associated with a prism housing the spotting scope **540**. The position of where the base is placed, fore or aft, determined according to configuration of the individual spotting scope and red dot or holographic scope. It is essential that both eyepieces **532** and **542** are disposed within the same plane and at an approximate even distance from the viewer's eyes when placed against the scopes in a face on position, not turned sideways. In FIG. **30**, which is a rear or end view of the assembly, the semicircle, centered on the pivot point of the assembly **10**, shows that the distance to the center of both eyepieces is very similar.

In the embodiment of FIGS. **19-24** the universal base **520** is positioned on top of the high power or spotting scope **540**. The arc-shaped portion formed at the bottom part of the base **510** receives and accommodates the exterior of a great variety of scopes. The pivot arrangement allows adjustment of the system of the invention to practically any distance between human pupils. In this manner, the invention covers a great range of distances from the narrowest distance between eyes to the widest.

In operation of the system, initially the pivot assembly is loosely positioned on the spotting scope **540**. Then, the adjustment-locking member **522** can be slightly loosened. Adjustable connection is between the zero magnification scope or holographic scope **530** viewed by a first eye of a user and the power scope **540** viewed by a second eye of the user.

If the two eyepieces, **532** and **542** are not on a horizontal plane or their optical axes are not parallel to each other, the universal base **510** will then be moved, until a horizontal plane is achieved. If, at that point, the distance between the eye pieces **532** and **542** changed, the clamp pivot **520** will also be moved up or down accordingly. Even if the IPD's exact measurement is not known, the same procedure will be followed by simply looking through the eyepieces **532** and **542**, as the universal base **510** and the clamp pivot **520** are being adjusted until the viewer gets a visual and/or mental indication that the optimal IPD has been achieved.

Referring now to FIGS. **25-28** illustrating a binocular system **600** according to another embodiment of the invention. This system is in many respects similar to the previously discussed system of FIGS. **19-24**. It is illustrated in FIGS. **25**, **26**, and **28** that zero magnification, holographic or red dot scope **630** is disposed inside a substantially hollow left tube **620** of the system which is movably connected to a power scope **640**. The binocular system **600** of the invention can be hand-held, mounted on the tripod or mounted on a helmet of a user.

Reference is made now to FIGS. **29-34** disclosing a further embodiment of the invention. FIG. **29** illustrates a system **700** of this embodiment with a camera setup **712**. In this embodiment, the camera **712** may be any type of camera, such as for example a 35 mm camera, Advanced Photo System (APS) camera, one-time-use camera, digital photo camera, digital video camera, etc. The connecting arrangement **720** is adapted for connection with standardized flash accessory shoe **718** of the camera. A zero magnification, red dot or holographic scope **710** is inserted in the clamp setup of the arrangement **720**. The camera includes a viewfinder **714** and/or a camera window **716** through which a photographer can view an image to be photographed. The photographer's view through the viewfinder is essentially a preview of the image that will be captured by the camera. The photographer should be able to discern by looking through the viewfinder which objects will fall within those boundaries and which objects will fall without. FIG. **29** shows the system **700** with the camera adapted for horizontal photography. On the other hand, FIG. **30** illustrates the system **700** with the camera adapted for vertical or portrait photography. The connecting arrangement **720** is adapted for association with a standardized flash accessory shoe **718** of the camera.

There are known two standardized flash accessory shoe standards. One is applicable for the Nikon-type cameras and the other for the Cannon-type cameras. Such accessories are slightly different from each other.

As illustrated in FIGS. **29-34**, the system **700** is provided for movable connection between the camera **712** and the zero magnification or the red dot scope **710**. The system consists of a connecting arrangement **720** movably integrated with the

zero magnification assembly **740**. The connecting arrangement consists of a connecting base **722** having an upper portion **724** and a lower portion **726**. An engaging recess **728** is provided at the lower portion **726** for slidable engagement with a shoe **718** of the camera. A connecting part **736** extends outwardly from the connecting base **722**, forming a part of the recess **728** adapted to movably accommodate a swivel arm **730**.

As best illustrated in at least FIG. **34**, the swivel arm **730** extends between the top part **732** and a bottom part **734**. A top swivel member **733** is movably received within the top part **732**, whereas a bottom swivel part **735** is rotatably accommodated at the bottom part **734**. An aperture **739** formed at a vertical wall of the engaging recess **765** is adapted for rotatable/threadable cooperation with an engaging portion of the bottom swivel member **735**.

As also illustrated in at least FIG. **34**, a zero magnification scope assembly **740**, consists a saddle part **742** adapted for connected with a pivot part **744**. The combination of the pivot and clamp parts define a receiving space **750** which can accommodate an exterior of practically any conventional zero magnification or red dot scopes. A receiving portion **746** extending outwardly from the pivot part **744** is formed with an aperture **748** which is adapted to movably/threadably accommodate an engaging portion of the top swivel member **733**.

In operation of the photographic camera system **700** illustrated in FIGS. **29-34**, initially the swivel members **733**, **735** are slightly loosened, and the red dot or holographic scope **710** is positioned to be within the same horizontal plane as the plane of the view finder **714**/window **716** of the camera **712**. The distance from the center of the viewfinder **714** to the center of the holographic or red dot scope **710** is set to match Interpupillary distance (IPD) of the user/photographer. Both pivot members **733**, **735** are now tightened.

It is essential to match position of the mark or the red dot or the holographic mark to rest on the target and for the same image appear in the center of the camera's viewfinder. It is recommended to arrange the holographic mark or the red dot to overlap or almost overlap the center of the viewfinder at infinity.

With the camera set on a tripod, fine adjustments begin by finding a stationary visual target, such as the top of a tower or a chimney, at ½ to 1 mile away and placing it in the center of the viewfinder or window.

Assuming the IPD is set, fine adjustments can be accomplished using the horizontal adjustment knob **735** and the vertical adjustment knob **733** associated with the holographic or red dot scope. In use optional adjusting knobs covers are removed and by turning the set-screw (slotted) clockwise, the mark will move towards the adjusting knob. Conversely, turning it counter clockwise will move the mark away from the adjusting knob.

From this point on, whether looking for a star, a bird in the sky or in the bush, if the red dot is placed on the visual target, it will appear in the photographer's magnified view, even if slightly of center.

The photographic camera system of the invention involves aligning the connecting arrangement **720** with the standardized flash accessory shoe **718** of the camera. Thus, the connecting base **722**, the swing arm **730** and the assembly **740** with the red dot scope **710** are movably accommodated at the top of the camera. The fastener **752** associated with the connecting base **722**, is then tightened to secure the arrangement to the camera shoe **718**.

With the swivel members **733**, **735** and clamp saddle knobs slightly loosened, the zero magnification, red dot or holographic scope **710** can be positioned at the same horizontal level/plane as a view finder/window **714**, **716** of the camera. The photographic system of the invention is capable of arranging vertical and horizontal shots. The distance from the center of the viewfinder to the center of the zero magnification, red dot or holographic scope is set to match the user's/photographers IPD.

To achieve better results, it is recommended to position the red dot or holographic scope **710** in the receiving space **750**, so the elevation adjusting knob or the top swivel member **733** to be oriented upwardly (see FIG. **30**). Fine adjustment can be made using a horizontal or bottom swivel member **735** and top **7333** red dot or holographic scope swivel member **733** to match the position of the red dot and the image in the center of the camera's viewfinder.

It is essential for the method of the invention to keep both eyes open. Let's assume the photographer sets the red or holographic dot to appear in the center of the viewfinder's image on the visual target 100 yards away. If the photographer is then looking for a visual target at a distance less than 100 yards, it will appear ever so slightly to the right of center of viewfinder. If further than 100 yards, it will appear to the left of center.

It recommended arranging the red or holographic dot to overlap the center of the viewfinder at infinity and to find a stationary visual target ½ to 1 mile away. When the camera **712** is set on a tripod, the IPD should be set and fine adjustments arranged. From this point on, whether looking for a star, a bird in sky or in the bush, if the red dot is placed on the visual target, it will appear in the photographer's magnified view, even if slightly of center.

It has been discussed above that according to embodiment of the invention illustrated in FIGS. **29-34** a zero magnification having the widest possible field of view, holographic or red dot scope **710**, for a point of reference, is combined to the camera **712** in parallel to the lens system. There is only the need to adjust the distance from the zero magnification scope to the viewfinder to match the distance between the photographer's eyes. Since the eyes work in parallel, when the photographer keeps both eyes open, places the holographic mark or the red dot **710** on the visual target, it simultaneously appears magnified in the view finder/window **714/716** and the picture is taken.

Referring now to FIGS. **35-38** illustrating a modified embodiment of a pivot assembly adapted to accommodate a standard Long Rifle (LR) as it is mounted on a riflescope discussed above with respect to FIGS. **9-13**. The modified embodiment of the assembly in many respects is similar to the previously discussed arrangement. Specifically, the universal base **360** is connected to the universal base clamp **366** by the respective fasteners. A combination of a camp pivot **351** and a clamp saddle **351***a* which define the receiving space **100**L accommodating an exterior of the red dot scope. The universal base sub-assembly and the clamp pivot sub-assembly are pivotably movable with respect to each other.

As best illustrated in FIG. **38** in the modified embodiment, the universal base **360** is formed with an independent top portion **362**, which is adapted for engagement with an independent bottom portion **364**. The top portion is provided with a male part **369** which extends outwardly from an engaging upper part **363**. The male part **369** is formed having a substantially cylindrical configuration. However, any conventional configuration of the male part is within the scope of the invention. The body of the male part and can be formed with an aperture **371** adapted for receiving an engaging section **356***a* of the locking fastener **356**. An opening **350** is defined at the upper part of the bottom portion **464** and is adapted to

movably receive the male part **369**. A substantially horizontal aperture **368** can be formed within the bottom portion **364**.

A shoulder region **340** is formed at the junction between the engaging upper part **363** and the male part **369** of the top portion **362** of the universal base. As illustrated in at least FIGS. **35**, **36** and **38**, the shoulder region **340** is defined by two substantially flat surfaces **340**, **344** positioned at an angle to each other.

The shoulder region **340** with the angle shaped surfaces **342** and **344** allow for a simple pivoting motion of the clamp pivot unit without removing the assembly from the riflescope. Arrow C (see FIG. **36**) illustrates the pivot action of the clamp pivot unit. The broken lines illustrate an alternate position of the clamp unit after completion of the pivotal motion in one direction.

The above-discussed split design of the universal base with the top **362** and bottom **364** portions, enables the sniper to initially and expeditiously adjust his set up. In this manner, when he or she approaches a target, alerting the target or prey to his presence can be avoided. By disengaging the male part **369** and the opening **350**, the sniper can remove the holographic or red dot scope with the top part **362** of the universal base. When the sniper/hunter is in the shooting position, he/she places the top part **362** into the bottom part **364**. To provide this connection, the male part **369** is inserted into the corresponding the opening **350**. Then, the fastener **356** is tightened, to fit into the indentation **358** on the male part **369**. A supplemental indentation is formed on the back of the male part **369** that corresponds to the position of the ball spring insert **357**. When the male part **369** is completely inserted into the opening **350** and the fastener **356** is fully tightened, the assembly is positively positioned, so the sniper can proceed without the necessity to adjust the original settings.

What is claimed is:

1. A photographic camera and a visual target acquisition scope system in combination, comprising:

a photographic camera comprising a body having at least top, front and rear portions, a receiving accessory at said top portion, a view finder and a photographic lens with an optical axis thereof is associated with the front portion and viewed with a first eye of the user;

a visual target acquisition scope system for adjustable connection between a unity magnification scope producing 1× magnification image viewed with a second eye of the user, the system comprising:

a lower swivel assembly adjustably connected to the camera receiving accessory and an upper swivel assembly adjustably receiving the unity magnification scope, at least one swivel member disposed substantially parallel to the optical axis of the photographic lens and movably/rotationally connecting the lower swivel assembly to the upper swivel assembly, the upper swivel assembly adjustably receiving the unity magnification scope;

wherein the upper swivel assembly and the unity magnification scope are rotatable about said at least one swivel member and about the axis which is substantially parallel to the optical axis of the photographic lens.

2. The combination of claim **1**, wherein the lower swivel assembly is formed by a swivel arm and a base connectable to the receiving accessory, said at least one swivel member comprises bottom and top swivel members associated with the swivel arm, the bottom swivel member is substantially parallel to the optical axis of the photographic lens and movably or rotationally connects the swivel arm to the base; the top swivel member is substantially parallel to the optical axis of the photographic lens and movably or rotationally connects the lower swivel assembly to the upper swivel assembly,

wherein the upper swivel assembly and the unity magnification scope are rotatable about the top swivel member, so that the unity magnification scope is rotatable about the top swivel member and about the axis which is substantially parallel to the optical axis of the photographic lens.

3. The combination of claim **2**, wherein an optical axis of the unity power scope is constantly maintained to be parallel to the optical axis of the photographic lens.

4. The combination of claim **2**, wherein the visual target acquisition scope system including the unity magnification scope can be simultaneously adjusted linearly within the receiving accessory in the direction substantially parallel to the optical axis of the photographic lens, and can be rotationally adjusted an axis which is substantially parallel to the optical axis of the photographic lens.

5. The combination of claim **4**, wherein the visual target acquisition scope system including the unity magnification scope can be further adjusted by means of rotation of the upper swivel assembly through rotation of the swivel arm about the bottom swivel member which is spaced from the first swivel member and is also parallel to the optical axis of the photographic lens.

6. The combination of claim **2**, wherein the top swivel member and the bottom swivel member are spaced from each other; the upper swivel assembly is rotatable about the top swivel member in the direction substantially parallel to the optical axis of the photographic lens.

7. The combination of claim **1**, wherein in use of said unity magnification scope and said photographic camera a user simultaneously finds a view of a target and maintain the target at an enlarged field of view, so that while the user is looking at the object through said unity magnification scope with the second eye and looking at the object through the lens of the camera with the first eye, the target visible to the second eye is simultaneously visible to the first eye, so as to provide acquisition and viewing of the object through the photographic lens by the first eye.

8. The combination of claim **1**, wherein said unity magnification scope is a red dot scope providing a red dot point of reference at the optical axis thereof, so that when the object is viewed simultaneously by said first and second eyes, while the red dot is placed on the object, said object simultaneously is visible within said photographic lens by the first eye and remains to be visible by the first eye as long as it remains visible to the second eye through said red dot scope.

9. A photographic camera and a visual target acquisition scope system in combination, comprising:

a photographic camera comprising a body having at least top, front and rear portions, a receiving accessory at said top portion, a view finder and a photographic lens with an optical axis thereof is associated with the front portion and viewed with a first eye of the user;

a visual target acquisition scope system for adjustable connection between a unity magnification scope producing 1× magnification image viewed with a second eye of the user, the system comprising:

a lower swivel assembly adjustably connected to the camera receiving accessory and an upper swivel assembly adjustably receiving the unity magnification scope, at least one swivel member disposed substantially parallel to the optical axis of the photographic lens and rotationally connecting the lower swivel assembly to the upper swivel assembly, the upper swivel assembly adjustably receiving the unity magnification scope; and

the upper swivel assembly and the unity magnification scope are rotatable about said at least one swivel mem-

ber and about the axis which is substantially parallel to the optical axis of the photographic lens;

wherein in use of said unity magnification scope and said photographic camera a user simultaneously finds a view of a target and maintain the target at an enlarged field of view, so that while the user is looking at the object through said unity magnification scope with the second eye and looking at the object through the lens of the camera with the first eye, the target visible to the second eye is simultaneously visible to the first eye, so as to provide acquisition and viewing of the object through the photographic lens by the first eye.

10. The combination of claim **9**, wherein the lower swivel assembly is formed by a swivel arm and a base connectable to the receiving accessory, said at least one swivel member comprises bottom and top swivel members associated with the swivel arm, the bottom swivel member is substantially parallel to the optical axis of the photographic lens and movably or rotationally connects the swivel arm to the base; the top swivel member is substantially parallel to the optical axis of the photographic lens and movably or rotationally connects the lower swivel assembly to the upper swivel assembly,

wherein the upper swivel assembly and the unity magnification scope are rotatable about the top swivel member, so that the unity magnification scope is rotatable about the top swivel member and about the axis which is substantially parallel to the optical axis of the photographic lens.

11. The combination of claim **10**, wherein the visual target acquisition scope system including the unity magnification scope can be simultaneously adjusted linearly within the receiving accessory in the direction substantially parallel to the optical axis of the photographic lens, and can be rotationally adjusted about the top swivel member which is substantially parallel to the optical axis of the photographic lens.

12. The combination of claim **11**, wherein the visual target acquisition scope system including the unity magnification scope can be further adjusted by means of rotation of the upper swivel assembly through rotation of the swivel arm about the bottom swivel member which is spaced from the first swivel member and is also parallel to the optical axis of the photographic lens.

* * * * *