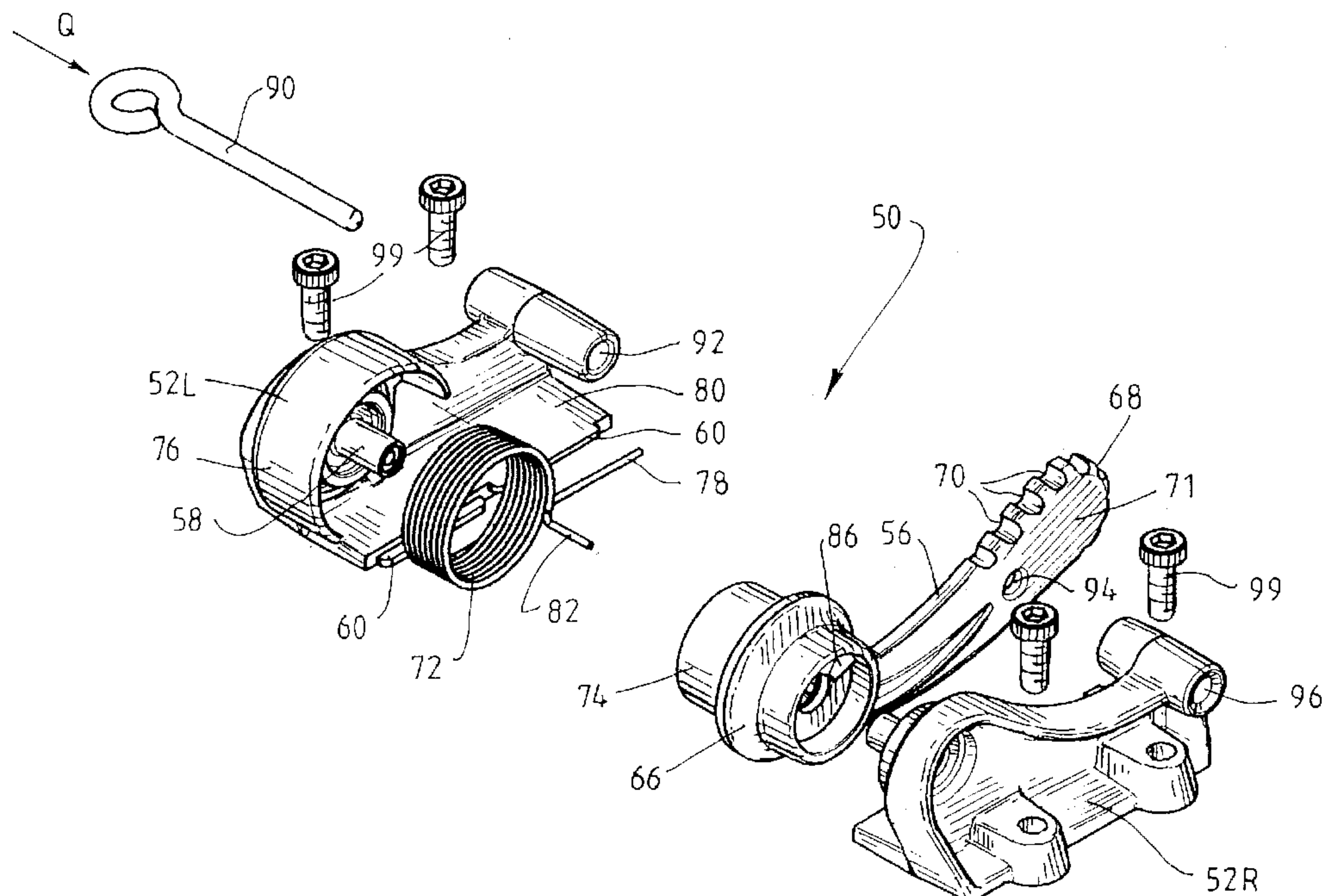




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(54) Title: SNOWBOARD BRAKE



(57) **Abrégé/Abstract:**

A braking device (10, 50, 203) for a board includes a brake base (16,52) and a braking arm (56) which is mountable to the base and movable relative thereto between a retracted position and a braking position. The device further includes a biasing spring (72) to bias the braking arm into its braking position, and a locking mechanism (13,90,206) operative to releasably lock the braking arm in its retracted position.



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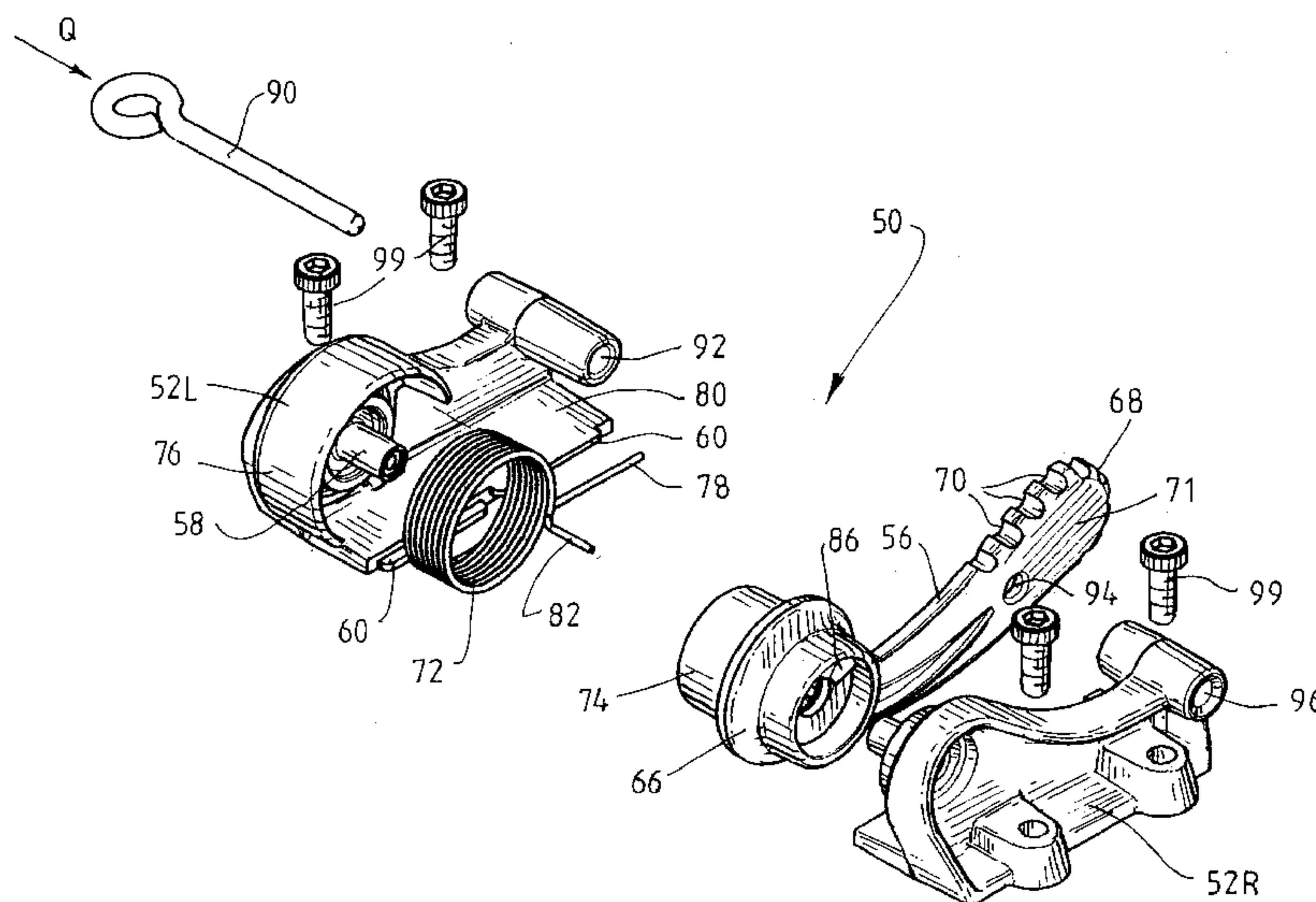
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(54) Title: SNOWBOARD BRAKE



(57) Abstract: A braking device (10, 50, 203) for a board includes a brake base (16, 52) and a braking arm (56) which is mountable to the base and movable relative thereto between a retracted position and a braking position. The device further includes a biasing spring (72) to bias the braking arm into its braking position, and a locking mechanism (13, 90, 206) operative to releasably lock the braking arm in its retracted position.

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

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SNOWBOARD BRAKE**Cross References**

5 The present application claims the benefit of United States Provisional Application Number 60/501,299 filed 8 September 2003.

Technical Field

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The present invention relates to a braking device that has been developed especially, but not exclusively, for use with snowboards, and the invention is herein described in that context. However, it is to be appreciated that the invention has broader application and may be used in other craft, boards or the like.

Background of Invention

20

In recent years the popularity of snowboarding has increased dramatically and it is now a major recreational activity in the ski fields. Conventional skis are fitted with bindings that are configured to release under an impact force. As such, braking devices have been incorporated in ski bindings to assist in arresting a released ski. Snowboards are usually not fitted with bindings that are designed to release under impact, and to date, snowboards have not been fitted with standard braking devices. Nevertheless, runaway snowboards still pose a significant hazard in the ski resorts.

Summary of Invention

35 In the first aspect, the present invention relates to a braking device for a board, the device comprising a brake base incorporating a mounting surface which is operative to be mounted to the board, and a braking arm which is mounted to the base and movable relative thereto

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between a retracted position and a braking position where the braking arm extends below the mounting surface; biasing means operative to move the arm to its braking position; and a locking mechanism operative to releasably
5 lock the braking arm in its retracted position.

In one embodiment, the locking mechanism is operative to release the braking arm from its retracted position in response to the application of a force to the locking mechanism in a predetermined direction. In one form, the
10 locking mechanism incorporates a locking pin which is moveable between an engaged position where it locks the braking arm in the retracted position to a disengaged position where it releases the braking arm from the brake base.

15 The braking device according to the above form has substantive practical benefit. In particular the device can be simply mounted to a snowboard either as a separate item or alternatively forming part of the snowboard binding. The braking arm is designed so that when in the
20 braking position it moves to a position where it projects below the board so as to be engagable with the underlying surface so as to anchor the board to the underlying surface. Further, the use of a locking mechanism which is able to be released on the application of a directional
25 force provides a simple system of release which is well suited to snow conditions and which may be activated by a snowboarder's boot or gloved hand.

In one form, the braking device incorporates a coupling point to couple a leash to the braking system.
30 In one form, the leash is arranged to be connected to the rider's boot or leg. In one form, the device is configured so that the locking mechanism is able to be released on applying tension to the leash. In a further form, on the application of that tension, the leash is
35 also designed to be disconnected from the base of the braking device. This may be achieved in one form by connecting the leash to the locking pin and removing the pin entirely from the brake base on release of the braking

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arm.

A leash is often used to connect the snowboarder to the snowboard. This is primarily a safety precaution to prevent injury as a result of a snowboard coming loose, particularly on a ski lift or tow where the rider generally has one foot free to improve manoeuvrability. The advantage of the above form of the present invention is that the snowboarder is able to both release the locking mechanism to unlock the brake and to disconnect the leash from the snowboard in a single action by applying tension to the leash.

In one form, the locking mechanism may only be designed to be released and the leash disconnected from the brake base when the leash is in a predetermined orientation. This orientation aligns with the directional force required to release the locking mechanism in accordance with one form of the invention. The advantage of this arrangement is that it inhibits inadvertent release of the brake or disconnection of the leash from the snowboard.

In an alternate form, the locking mechanism is operative to release the braking arm from its retracted position in response to the release of one of the bindings. In a particular alternate form, the device is configured such that the locking mechanism is operative to be released on release of the strap on the binding.

The braking device according to the alternate form has the practical benefit of eliminating the need to attach the leash that is often used to connect the snowboarder to the snowboard. The attaching of the leash to the boot or the leg can be difficult in cold conditions and whilst wearing gloves. With the braking device configured so that the locking mechanism is operative to be released on release of the binding removes the requirement to separately connect the leash to the rider's boot or leg as well as engaging the boot in the binding.

In one form the braking device is provided as a separate device to the binding. Alternatively, the

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braking device can be incorporated into the binding assembly.

The provision of a separate braking device enables the device to be added to current snowboard configurations without the need to purchase a new binding. However, the braking device could be incorporated into the design of the binding, this incorporation providing a further marketable feature to the binding. The braking device can be added to binding configurations such as strap-in and step-in bindings.

In a one form, the braking arm is pivotally mounted to the brake base. In that application, a biasing element such as a coil spring is used to cause the braking arm to pivot about its pivot point between the retracted and the braking position. The advantage of this arrangement is that it is a simple mechanism which is still likely to function in ice and snow conditions. In one form, the spring type may be adjustable so as to vary the tension in the spring, or be non adjustable. However, it is to be appreciated that the braking arm may move other than by a pivoting action. For example, the braking arm may move solely by a linear movement, where the arm is designed to move through an aperture in the board, or by a combination of a linear, and pivoting movement.

In one form, the base is shaped as a channel and includes a base portion which incorporates the mounting surface and upstanding flanges. When in the retracted position, the braking arm may nest within the flanges. In one form, apertures are provided in the flanges and in the braking lever to receive a locking pin to releasably lock the braking arm in its retracted position.

In one form, the base has an engagement surface that limits the travel of the braking arm from its retracted to its braking position. In one form, the braking arm is biased to remain in its braking position under the biasing element. In another form, the braking device includes a separate locking arrangement to lock the braking arm in its braking position.

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In one form, when used in conjunction with a snowboard, the braking device is arranged adjacent the toe edge of the snowboard and when activated, the braking arm protrudes over the toe edge and downwardly below a lower
5 surface of the board. In another form, the braking device may incorporate a pair of braking arms which are operative to protrude over both the toe edge and the opposite heel edge of the board.

In a further aspect, the invention relates to a
10 combined brake and leash arrangement for use in a snowboard or the like.

In yet a further aspect, the invention relates to a snowboard when incorporating a braking device according to any of the forms described above.

15

Brief Description of the Drawings

It is convenient to hereinafter describe embodiments of the present invention with reference to the
20 accompanying drawings. It is to be understood that the particularity of the drawings and the related description does not supersede the preceding broad description of the invention.

In the drawings:

25 Fig. 1 is a perspective view of a snowboard incorporating a braking device;

Fig. 2 is a side elevation of braking device mounted to the snowboard of Fig. 1 in a retracted position;

30 Fig. 3 is the braking device of Fig. 2 in a braking position;

Fig. 4 is a plan view of the braking device of Fig. 2;

Fig. 5(a) is a plan view of a second spring configuration of the device of Fig. 2;

35 Fig. 5(b) and 5(c) are side and top views respectively of the spring in a second braking device configuration;

Fig. 6 is a perspective view of a braking device

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integrated into a strap-in binding;

Fig. 7 is a perspective view of a braking device integrated into a step-in binding;

Fig. 8 is a top view of a further embodiment of a
5 brake device;

Fig. 9 is a side view of the brake device of Fig. 8;

Fig. 10 is a bottom view of the brake device of
Fig. 8;

Fig. 11 is a perspective view of the brake device of
10 Fig. 8;

Fig. 12 is an alternate perspective view of the exploded brake device of Fig. 8;

Fig. 13 is a perspective view of the braking device of Fig. 8 mounted to a binding with the device in a
15 retracted position;

Fig. 14 is a perspective view of the device of Fig. 13 in a braking position.

Fig. 15 is a top view of the brake device of Fig. 13 in a braking position;

Fig. 16 is a side view of the device of Fig. 13 and illustrates the actuation between the retracted position and the braking position;

Fig. 17 is an exploded perspective view of an alternate embodiment of a brake device incorporating a
25 snow clearing serrations;

Fig. 18 is a top view of a brake actuator incorporated into a binding; and

Fig 19. is a top view of a variation of the brake actuator of Fig. 18.

30

Detailed Description of the Drawings

Fig. 1 illustrates a snowboard 100 that incorporates upper and lower surfaces (101, 102 respectively) and
35 opposite edges 103 and 104 which interconnect the upper and lower surfaces. Mounted on the upper surface 101, are front and rear bindings 105, 106. In the illustrated form, the bindings, which extend generally transversely to

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the longitudinally direction of the board are of a standard form and include a plurality of straps 107 which are each individually releasable. In use, a rider is secured to the board by strapping their boots into the
5 respective bindings 105, 106.

In the illustrated form, the snowboard 100 also includes a braking device 10 that is located on the upper surface 101 adjacent and rearward of the front binding 105 and forward of the back binding 106. The device 10 is
10 located adjacent one edge 103 which in use is the toe edge of the board 100. As discussed in more detail below, the braking device 10 has the dual function of inhibiting runaway of the board if it is detached from the rider and also provides an anchor point for a leash which in use is
15 attached to the snowboard rider.

Figs. 2 to 4 illustrate the braking device 10 in more detail. The device 10 includes a base 11 and a braking arm 12 which is pivotally mounted to the base 11 through a pivot axle 13 so as to be movable from a retracted
20 position as illustrated in Fig. 2 to a braking position as illustrated in Fig. 3.

The base 11 is formed as a channel and has a web 14 and a pair of flanges 15 and 16 upstanding from the base. The web 14 includes a lower mounting surface 17 which
25 locates on the upper surface 101 of the snowboard 100. In the illustrated form, the web 14 incorporates preformed apertures 18, 19 which are operative to receive mechanical fasteners 20 (which in the illustrated embodiment are self tapping screws) so as to secure the brake device 10 to the
30 snowboard 100.

The flanges 15 and 16 of the base 11 also includes a pair of aligned apertures 21, 22 which in use align with an aperture 23 formed in the braking arm 12 when the arm is in its retracted position. In the retracted position,
35 the braking arm 12 nests between the flanges 15, 16 and a locking pin 24 is designed to locate through the aligned apertures 21, 22, 23 so as to provide a simple locking mechanism for the braking device 10 to lock the braking 12

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in its retracted position.

The locking arm 12 is formed in a blade like structure and has a proximal end 25 which is secured to the pivot axle 13 and a distal end 26. The distal end 26
5 incorporates the aperture 23 which is designed to receive the locking pin 24 and also incorporates a series of grooves 27. The braking arm, with its blade like structure, is designed to penetrate the snow. The
10 advantage of designing the braking arm to have a blade structure is that an edge surface 28 is more easily able to cut through the snow whilst the side faces 29, 30 present a relatively large surface area that provides resistance to travel of the board in a forward or rearward direction. The grooves 27 facilitate penetration of the
15 braking arm into the snow, the gripping of ice by the arm and gripping of the braking arm by gloved hand or boot to move it back to its retracted position for arming.

To enable the braking arm 12 to engage with the snow, the braking device 10 is designed so that when the arm 12
20 moves from its retracted position to its braking position, it moves to a position where it projects over the edge 103 of the board and below the lower surface 102. With this movement, the distal end 23 is able to cut into and become embedded in the snow when the board is located with its
25 lower surface resting on the snow.

To initiate the movement of the braking arm between the retracted and the braking position, a spring 31 is disposed around the pivot axle 13 and engages with both the base 11 and the braking arm 12. In the illustrated
30 form, a coil spring is used which is designed to release as the braking arm moves from the retracted to its braking position. Furthermore, to control the extent of movement, the base includes an abutment surface 32 formed by an outer edge of the base edge 14 and is designed to engage
35 an edge surface 28 of the braking arm 12 when it locates in its braking position. The edge surface 28 in the illustrated form incorporates a pad 33 to provide a cushioning effect on engagement of the edge 28 on the

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abutment surface 32.

As best illustrated in Fig. 4, the locking pin 24 incorporates an eyelet 34 which provides a coupling point for a leash 110. The leash 110 is designed to have its other end connected to the front boot of the rider. The purpose of the leash 110 is as a backup safety measure to keep the rider attached to the board should the rider's boots inadvertently come out of the bindings 105, 106. This is most likely to occur when the rider has already disengaged the rear binding to allow the rider to manoeuvre more easily when using ski lifts or the like.

As is apparent from the arrangement in Fig. 4, the locking pin is releasable from the base 11 only when the pin is pulled in a pre-determined direction as illustrated by the arrow P. The locking pin 24 also include a plurality of spring loaded retainer elements 35 which when the locking pin is inserted, engage on an outer face of the flange 15 so as to require a pre-determined loading to enable the pin 24 to be removed from the base so as to release the braking arm.

The braking device 10 is positioned rearward of the front binding 105 so that the direction of movement P required to release the locking pin is in a rearward direction of the board. With this arrangement, the locking pin is unlikely to inadvertently release. Further, if the riders feet became disengaged from the respective binding 105, 106 whilst in the air (such as on a ski lift), the board would still be retained by the leash 110. Furthermore, as the locking device 10 is located forward of the centre of gravity of the board 100 adjacent the front binding 105, the board would tend to hang so that the front edge is toward the rider. This position would not cause the locking pin to release from the base 11 thereby keeping the board 100 attached to the rider.

In normal operation, when a rider wants to become released from the snowboard 100 the rider can simply undo the bindings 105 and 106 and then through a simple

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rearward action remove the locking pin by applying tension to the leash in a rearward direction of the board. This movement not only activates the brake but also releases the leash from the board 100 as the locking pin is removed from the base 11. With this arrangement the leash and the locking pin remain attached to the rider's boot where it remains securely attached to the rider and is unlikely to be lost.

Fig. 5 illustrates an alternate spring configuration for the braking device 10. As many of the elements are present in the current embodiment are the same as the previous embodiment, like reference numerals will be used for like elements. The alternate spring configuration comprises a two part coil spring 36 disposed around two sections of the pivot axle 13. Each spring part engages with a respective flange 15 and 16 on the base 11 and the braking arm 12. The two part coil spring 36 enables the locking arm to be centred in the braking base. The centring of the arm helps prevent snow and ice build-up inhibiting the movement of the braking arm between the retracted and braking position.

The spring 36 also includes saddles 37 and 38 which are formed at its outer ends and which facilitate connection the spring to the brake base 11. The braking device 10 can be assembled with the braking arm 12 aligned in its braking position between the flanges 15 and 16 on the base 11. The spring 36 is located with the saddles 37 engaging the flanges 15 and 16, and the saddle 38 engaging the braking arm 12. After the positioning of a pivot axle 13 to secure the assembly, the spring 36 can be stressed by moving the braking arm 12 into its retracted position.

Figs. 6 and 7 illustrate further embodiment where the braking device 10 operates in association with the boot binding 105.

In the arrangement as illustrated in Fig. 6, the binding 105 is of a strap-in design and incorporates a pair of adjustable straps 120, 121. The front strap incorporates a resilient flap 122 which is able to

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tensioned over the boot of a rider by locking mechanism 123. In use, the leash 110 of the braking device 10 is connected to the lower flap 122 as distinct from being connected to the rider's boot as in the previous arrangement. In addition, the locking pin 24 is located through the brake base in a direction such that it is released by a movement toward the binding 105, rather than away from it as in the earlier embodiment. This direction of movement is illustrated by the arrow Q. With this arrangement, release of the binding by releasing the lock mechanism 123 removes the force acting the resilient flap 122 causing it to bow upwards, which in turn tensions the leash 110 causing automatic removal of the locking pin from the braking device 10 thereby allowing the braking arm to move to its braking position under the action of the spring 31. As in the earlier embodiment, the locking pin remains attached to the leash 110 which in turns remains securely fastened to the binding 105.

In the arrangement of Fig. 7, the braking device 10 is not provided as a separate item, but rather is formed as part of the binding 105. In the arrangement of Fig. 7 the binding 105 is a step-in design and includes a base plate 130 which incorporates an outer portion 131 which merges with the base surface 14 of the base 11. In other respects, the braking device 10 operates in the same manner as the device previously described. The advantage of the arrangement of Fig. 7 is that by combining the binding and the braking device simplifies installation of the components on the snowboard and obviates the need for separate setting of the braking device on the board or a separate fixing to the board.

Figs. 8 to 12 illustrate a further embodiment of a braking device 50 having a moulded base 52 with a flat underside 54 that has a mating surface for mounting the braking device 50 on a snowboard in a configuration similar to the positioning of the braking device 10 positioned on the upper surface 101 of snowboard 100.

In the description that follows, like reference

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numerals will be used to the previous embodiments to refer to the snowboard. However due to differences between the following and preceding embodiments, different reference numerals are used in referring to the braking device 50.

5 Nevertheless, many features of the following embodiments are shared with the preceding.

The device of the braking device 50 is shown in Figs. 11 and 12. Many of the device parts are formed from a plastic material such as HDPE, typically by an injection
10 moulding process. A moulded base 52 is assembled from a left half 52L and a right half 52R that interlock together to provide, when assembled, a shaft 58 for a braking arm 56 to pivot about. The flat underside 54 of each moulded base half (52L, 52R) is maintained in alignment by the
15 provision of interlocking tabs 60 that when locked together prevent the relative rotation of each moulded base half (52L, 52R) about the axis of the shaft 58.

The braking arm 56 has an integrally formed hub 66 for engaging and pivoting about the base 52. Projecting
20 radially from this hub is a blade in the form of a flat paddle portion 68. The paddle like portion 68 has a serrated edge section 70 for gripping and broad faces 71 to provide resistance to travel of the board through the snow in a forward or rearward direction similar to the
25 previous embodiments.

The braking arm 56 is biased towards the braking position by a torsional bias provided by a coil spring 72. In an alternate embodiment, the bias towards the braking position is provided by a resilient member that is bent to
30 provide the bias.

In contrast to the previous embodiments, the biasing means is substantially concealed between a collar 74 portion of the hub 66 and a cowling 76 integrally formed in the left half of the base 52L. The concealment of the
35 coil spring 72 prevents build-up of snow and ice in the mechanism that may impede the actuation of the braking arm 56. The concealment also can prevent pinching of fingers in the biasing means and provide for simple

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assembly.

The braking arm 56 pivots between a retracted position and a braking position. This torsional bias of the coil spring 72 is provided between a longitudinally extension 78 pressing against a flat topside 80 of the left half 52L and a transverse extension 82 engaging one of several spline projections 84 extending radially towards the axis of the hub 60. As well as concealing the spring, the collar 74 also prevents distortion of the coil spring 72.

The coil spring 72 can also provide the bias for a single toothed one-way dog clutch that locks the braking arm 56 in the braking position. In alternate embodiments, this transverse bias is provided by a separate spring that is nested within the coil spring 71 and bears against the hub 66 and the left base half 52L. In either spring configuration, the braking arm 56 is biased towards the right base half 52R such that a lug 86 is pressed against a locking ramp 88. Upon activation of the braking device 50, the lug 86 rides up the locking ramp 88 until it drops off the end of the locking ramp 88 to lock the braking arm 56 in the braking position.

To release the dog clutch, and thereby the braking arm 56 from the braking position, the arm is pressed and moved transversely towards the left base half 52L. Once moved transversely the braking arm 56 can then be moved back into the retracted position and locked with a locking pin 90 that forms part of the locking mechanism. The pin 90 is removed in use by the application of a predetermined force to the leash 110 that is tethered to the board rider.

Locking of the braking arm 56 is achieved by inserting a pin 90 in a direction Q as shown in Figs. 11 and 12. The inserted pin extends parallel to the flat underside and transversely with respect to the braking device 50. During insertion in the direction Q, the pin passes sequentially through apertures (92, 94 and 96) in the left half 52L, the braking arm 56 and then the right

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half 52R. This locked configuration is shown in Figs. 8 to 10. Alternatively, the pin can be inserted in the opposite direction to Q. The braking device is designed to enable the gloved hand of a rider to manipulate the device.

Figs. 13 to 16 show the embodiment of Figs. 8 to 12 mounted to a simplified binding sub-plate 98 by fasteners 99. The binding being adapted for fastening to the upper surface 101 of the snowboard 100.

Fig. 13 shows the braking device 50 in its retracted and armed configuration. Upon removal of the pin 90 that locks the braking arm 56, the braking arm 56 moved through an arcuate path towards the braking position. As the braking arm approaches the braking position, the dog clutch engages to lock the device into the braking position as shown in Fig. 14.

Fig. 15 and 16 show the braking device 50 in relation to the snowboard 100. The braking device 50 is positioned such that when the braking arm 56 moves its maximum extent towards the braking position, it does not bear against the snowboard edge 103. This embodiment of the invention prevents impact damage to the edge of the board following repeated activations of the braking device 50. To achieve this positioning of the braking device 50, the sub-plate is selected to match the board width.

Fig. 16 also illustrates the arcuate path R through which the braking arm 56 travels. From the retracted position to the braking position, the arm moves through 270° about its pivot.

Fig. 17 shows a brake device 50 incorporating a snow clearing serrations 150 on each of the left half 52L, the braking arm 56 and then the right half 52R. These serrations fragment and disperse ice build up on the braking device.

Figs. 18 and 19 show the braking device 50 with an actuator (200, 201) operative to release the locking mechanism. Each actuator (200,201) has a cable 202 enclosed in a sheathing and adapted to move along its

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longitudinal axis to operate the braking device 50. The cable 202 can be configured to operate the braking device 203 by movement of the cable in either direction along its longitudinal axis. Movement of the cable in the actuator 5 200 is in response the movement of an activation device in the form of a lever 204.

Referring to the device 200 of Fig. 18, in use when the boot of a snowboarder is secured into the binding 205, the boot depresses the lever 204 to push the cable towards 10 the braking device 203. This movement of the cable 202 configures the locking mechanism 206 of the braking device 203 such that locking mechanism 206 will lock the braking arm 208 in its retracted position when it is moved into this position by the snowboarder. To enable the lock to 15 be moved into its retracted position with the boot secured in the binding, the locking mechanism 206 includes a latch element 207 moveable within a cavity formed in right base half 52R that enables the arm to move into its retracted position.

20 When the boot of the snowboarder is removed from the binding 205, the lever 204 is raised by a biasing mechanism 210 to pull the cable away from the braking device 203. This movement of the cable operates the locking mechanism 206 to move latch element 207 and 25 release the braking arm 208 and thereby cause the braking arm to move to its braking position.

Referring to the device 201 of Fig. 19, the cable 202 and the locking mechanism 206 are similar to the actuator 200 of Fig. 18 but in this embodiment the actuator 201 30 includes a foot pad 212 for retrofitting the actuator to a conventional binding. Once fitted the use of the foot pad device 201 is similar to the lever device 200.

In either actuator (200, 201) the cable can be replaced with alternate elongated members such as a rod or 35 a chain. In the embodiments of the braking device, the latch element can take alternate forms such as a detent or clasp.

Accordingly, the present invention provides a braking

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device which is easy to operate and in its braking position, effective in impeding the motion of a snowboard. The braking device uses few moving parts and the embodiments have the added advantage that they allow for
5 simultaneous activation of the device and release of a safety leash. Further, the brake can either be fitted directly to a snowboard independent of the bindings or it can be integrated into the binding itself.

In the claims which follow and in the preceding
10 description of the invention, except where the context requires otherwise due to express language or necessary implication, the word "comprise" or variations such as "comprises" or "comprising" is used in an inclusive sense, i.e. to specify the presence of the stated features but
15 not to preclude the presence or addition of further features in various embodiments of the invention.

Variations and/or modifications may be made to the part previously described without departing from the spirit or ambient of the present invention.

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Claims

1. A braking device for a board, comprising a brake base incorporating a mounting surface which is operative to be mounted to the board, and a braking arm which is mountable to the base and movable relative thereto between a retracted position and a braking position where the braking arm extends below the mounting surface, biasing means operative to bias the braking arm to move the arm to its braking position, and a locking mechanism operative to releasably lock the braking arm in its retracted position.
2. A braking device according to claim 1, wherein the locking mechanism is operative to release the braking arm from its retracted position in response to the application of a force to the locking mechanism in a predetermined direction.
3. A braking device according to either claim 1 or 2, wherein the locking mechanism incorporates a locking pin which is movable between an engaged position where it locks the braking arm in the retracted position, to a disengaged position where it releases the braking arm from the brake base.
4. A braking device according to claim 1, further comprising a coupling to couple a leash to the braking device, and wherein the device is configured so that the locking mechanism is operative to be released on tensioning of the leash to impart a predetermined force on the coupling.
5. A braking device according to claim 4, wherein the predetermined force on the coupling to release the locking mechanism is in a predetermined direction.
6. A braking device according to claim 4, wherein the device is arranged so that on application of the tension to the leash to release the locking mechanism, the leash disconnects from the base of the braking device.
7. A braking device according to any one of claims 4 to 6, wherein the locking mechanism incorporates a locking pin which is movable between an engaged position where it

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locks the braking arm in its retracted position, to a disengaged position where it releases the braking arm from the brake base and separates from the brake base, and wherein the coupling is disposed on the locking pin.

8. A braking device according to claim 1, further comprising an actuator associated with the locking mechanism and operative to be activated to cause the locking mechanism to release the braking arm from its retracted position.

9. A braking device according to claim 8, where the actuator is in the form of a leash that is coupled to the locking mechanism and is operative to be activated by tensioning of the leash.

10. A braking device according to claim 8, wherein the actuator incorporates a cable and is activated by movement of the cable along its longitudinal axis.

11. A braking device according to claim 10, wherein one end of the cable is coupled to the locking mechanism and the other end is coupled to an activation device operative to impart longitudinal movement to the cable to activate the actuator.

12. A braking device according to claim 12, wherein the activation device is locatable with a binding on the board.

13. A braking device according to any preceding claim, wherein the braking arm is arranged to move about an axis in movement between its retracted position and braking position.

14. A braking device according to claim 13, wherein the mounting surface is generally planar and the axis is parallel to the mounting surface.

15. A braking device according to any preceding claim wherein the braking arm rotates through greater than 180° between the retracted position and the braking position.

16. A braking device according to any preceding claim, wherein the base is shaped as a channel and includes a mounting portion which incorporates the mounting surface, and a pair of upstanding flanges, wherein when in the

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retracted position, the braking arm is operative to nest within the flanges.

17. A braking device according to claim 16, wherein the base is constructed from two interlocking components.

18. A braking device according to any preceding claim further comprising a second locking mechanism operative to releaseably lock the braking arm in its braking position.

19. A braking device according to claim 18, wherein the second locking mechanism is operable in response to the movement of the braking arm towards the braking position to lock the braking arm in its braking position.

20. A braking device according to claim 19, wherein the second locking mechanism comprises a first locking element located on the braking arm and a second locking element located on the base, at least one of the elements being moveable to move the elements into an engaged position to lock the braking arm in its braking position.

21. A braking device according to either claim 19 or 20, wherein the braking arm is arranged to move about an axis in movement between its retracted position and braking position and the braking arm moves along the axis on movement of the braking arm to the braking position, and when said axial movement causes the first and second locking elements to move into the engaged position.

22. A braking device according any one of claim 18 to 21, wherein the second locking mechanism is a dog clutch.

23. A braking device according to any preceding claim wherein the biasing means is a torsional spring.

24. A braking device according to any preceding claim wherein the biasing means is located within a cowling forming part of the brake base.

25. A snowboard having an upper and lower surface and opposite side surfaces interconnecting the upper and lower surfaces, the snowboard also incorporating a braking device according to any preceding claim.

26. A snowboard according to claim 25, wherein the braking device is arranged adjacent one of the edges of the snowboard and when activated, the braking arm

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protrudes over the edge and downwardly below the lower surface of the board.

27. A snowboard according to either claim 25 or 26, wherein the braking device is located on the upper surface intermediate front and rear bindings of the snowboard.

28. A snowboard according to claim 27, wherein the braking device is located adjacent the front binding.

29. A snowboard according to either claims 25 or 26, further comprising a coupling to couple the braking device to one of the bindings, and wherein the device is configured so that the locking mechanism is operative to be released on release of the binding to which the braking device is connected.

30. A snowboard according to any one of claims 26 to 29, wherein the braking device further comprises an actuator associated with the locking mechanism and operative to be activated to cause the locking mechanism to release the braking arm from its retracted position, the actuator including an activation device located in at least one of the bindings to activate the actuator.

31. A snowboard according to any one of claims 25 to 30, wherein the binding is a strap-in binding and the activation device is operative to activate the activator on release of a strap on at least one binding.

32. A braking arm for use with a snowboard braking device comprising a blade connected at a proximal end and projecting radially from a hub, an edge portion of the blade provided with gripping elements, an aperture located at the distal end of the blade for receipt of a locking pin.

33. A braking arm according to claim 32, wherein the gripping elements are serrations formed in the edge of the blade.

34. A braking arm according to either claim 31 or 32, wherein the hub includes at least one spline for engaging a biasing means.

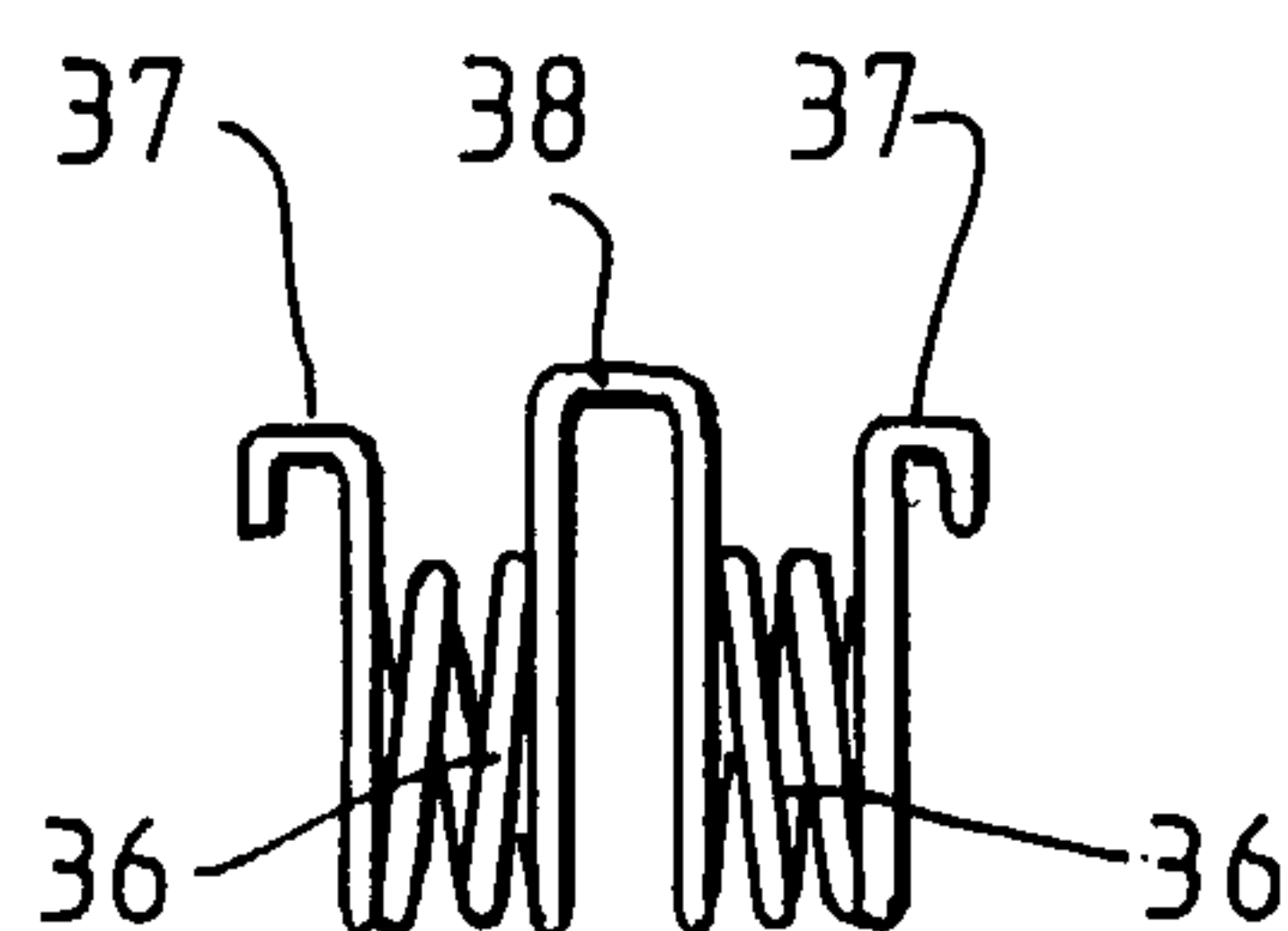
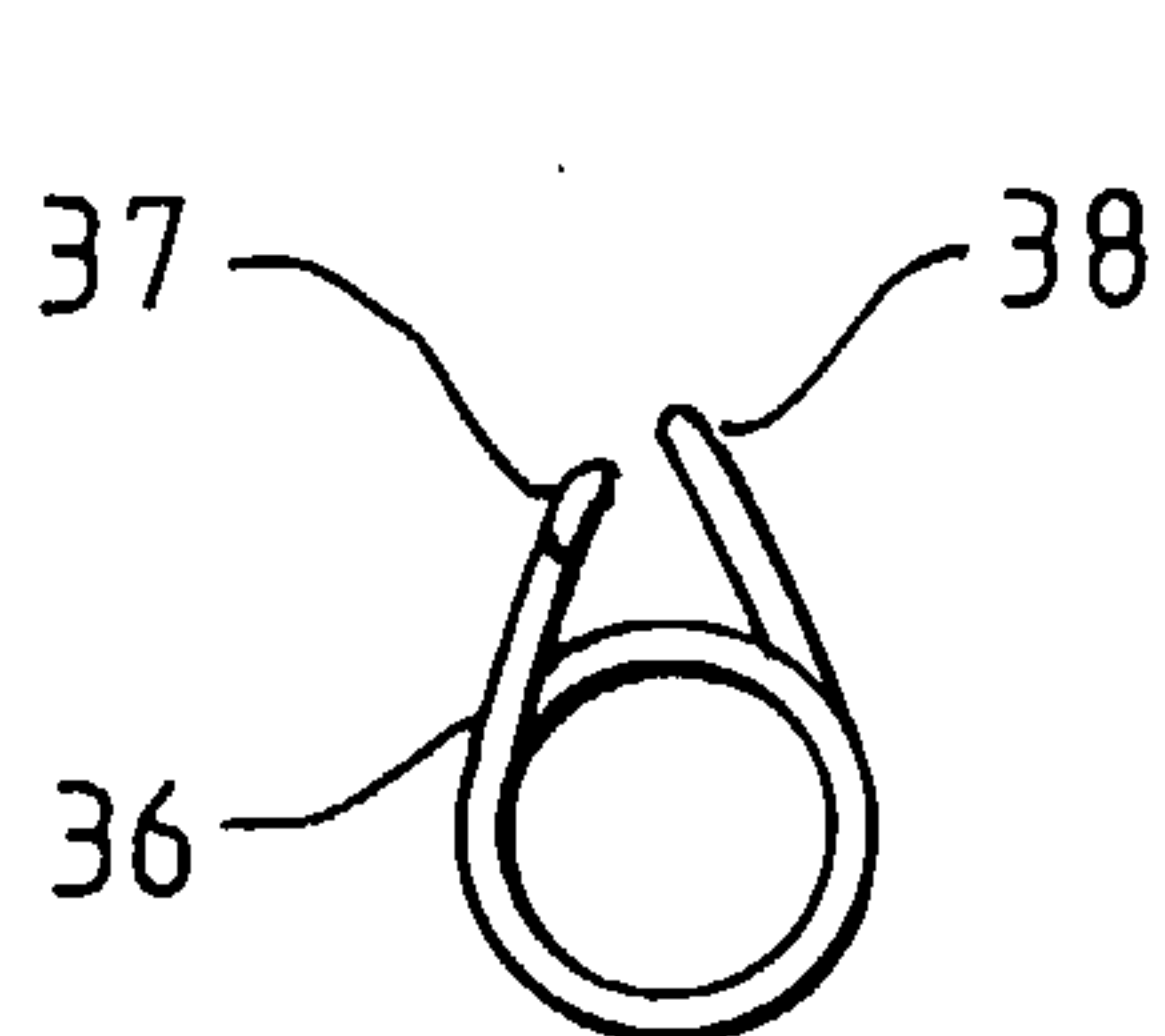
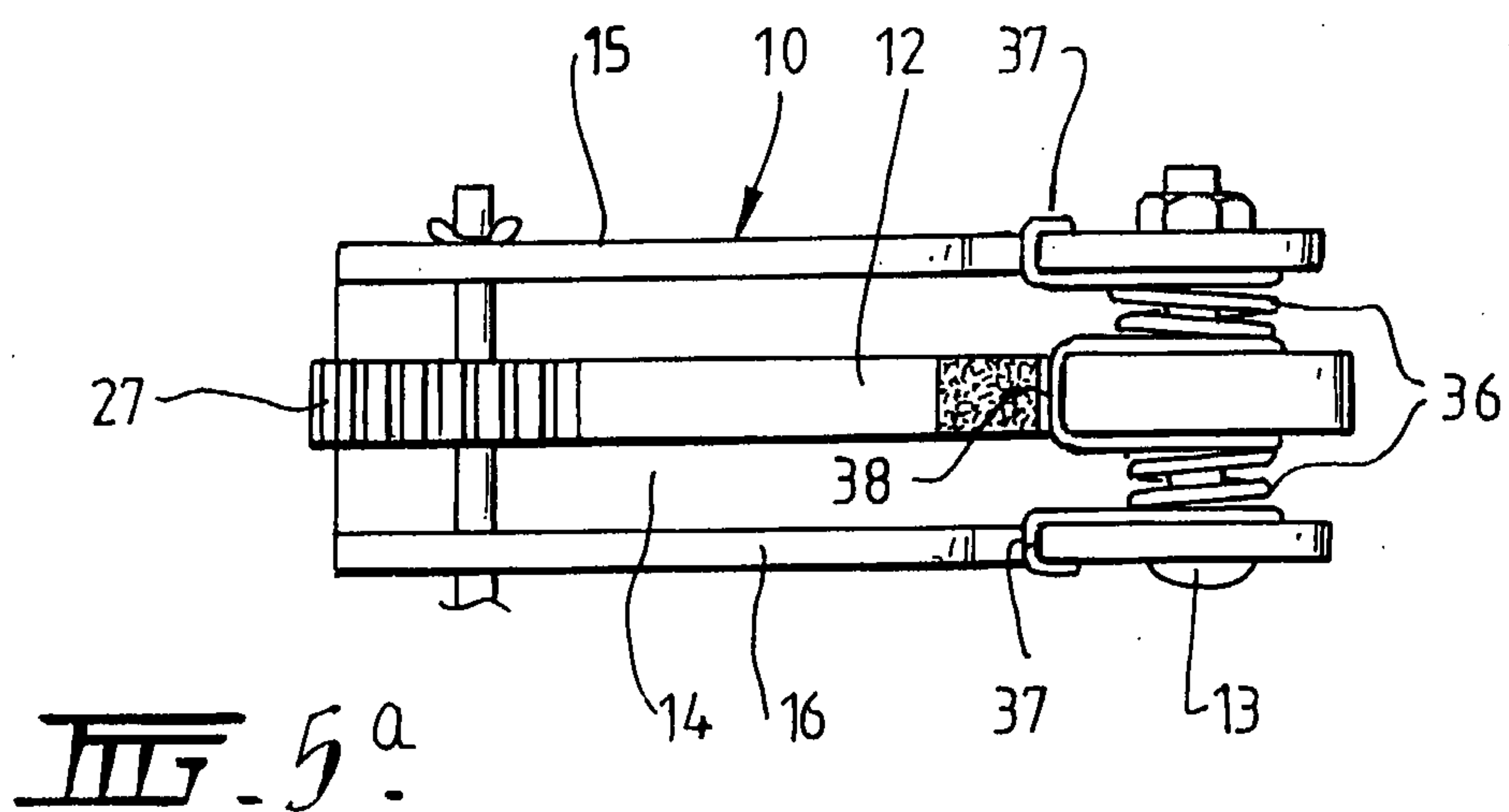
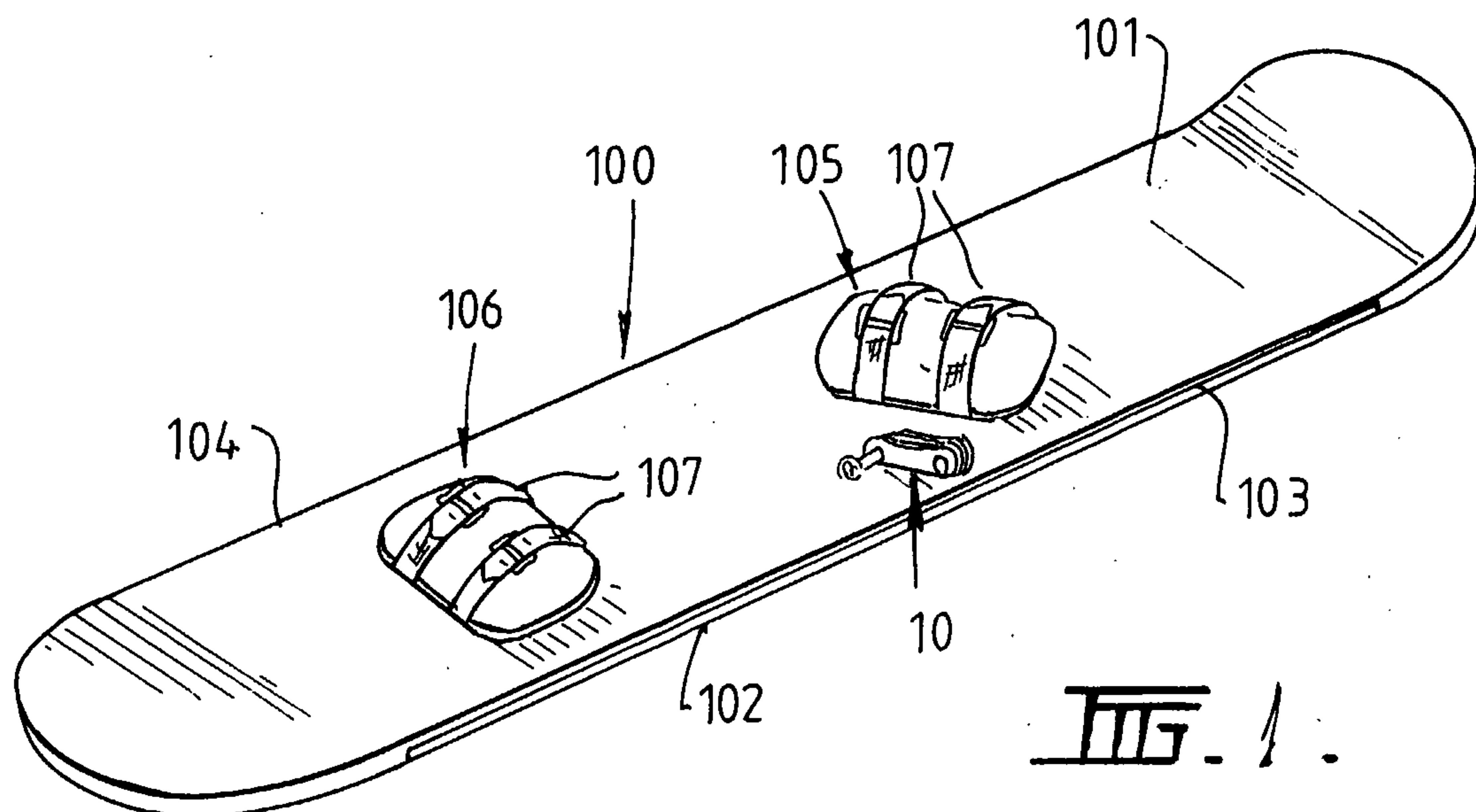
35. A braking arm according to one of claims 31 to 34, wherein a portion of the hub forms part of a dog clutch.

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36. A method of applying a brake to a board, the method comprising the steps of:

- providing a braking device on the board, the device having a braking arm which is movable from a retracted position to a braking position, and which is releasably locked in its retracted position;
- interconnecting a leash between the braking device and a user of the board;
- releasing the braking arm from its retracted position by tensioning of the leash.

37. A method according to claim 36, further comprising the steps of disengaging the leash from the board on releasing of the braking arm.



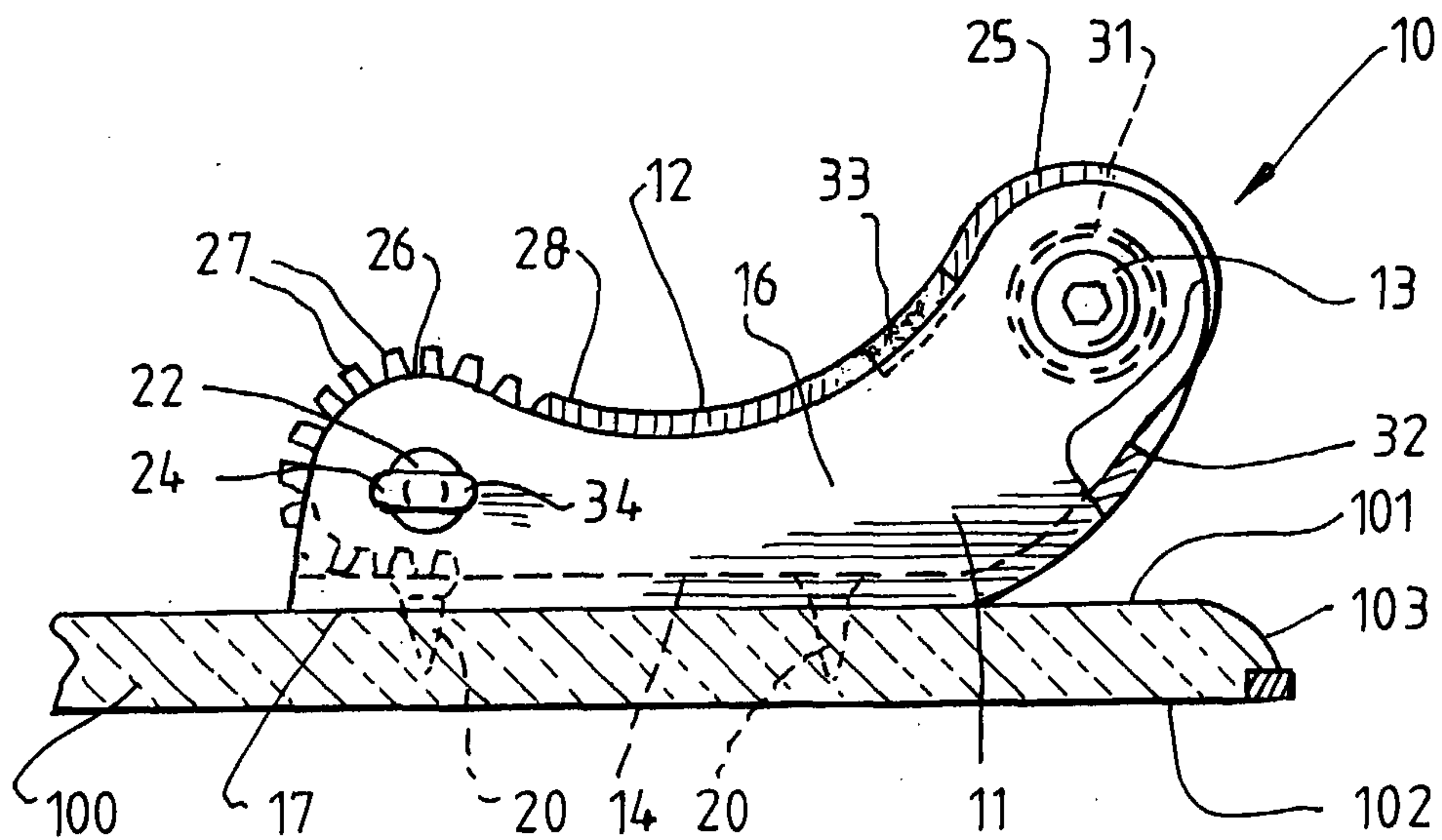


FIG. 2.

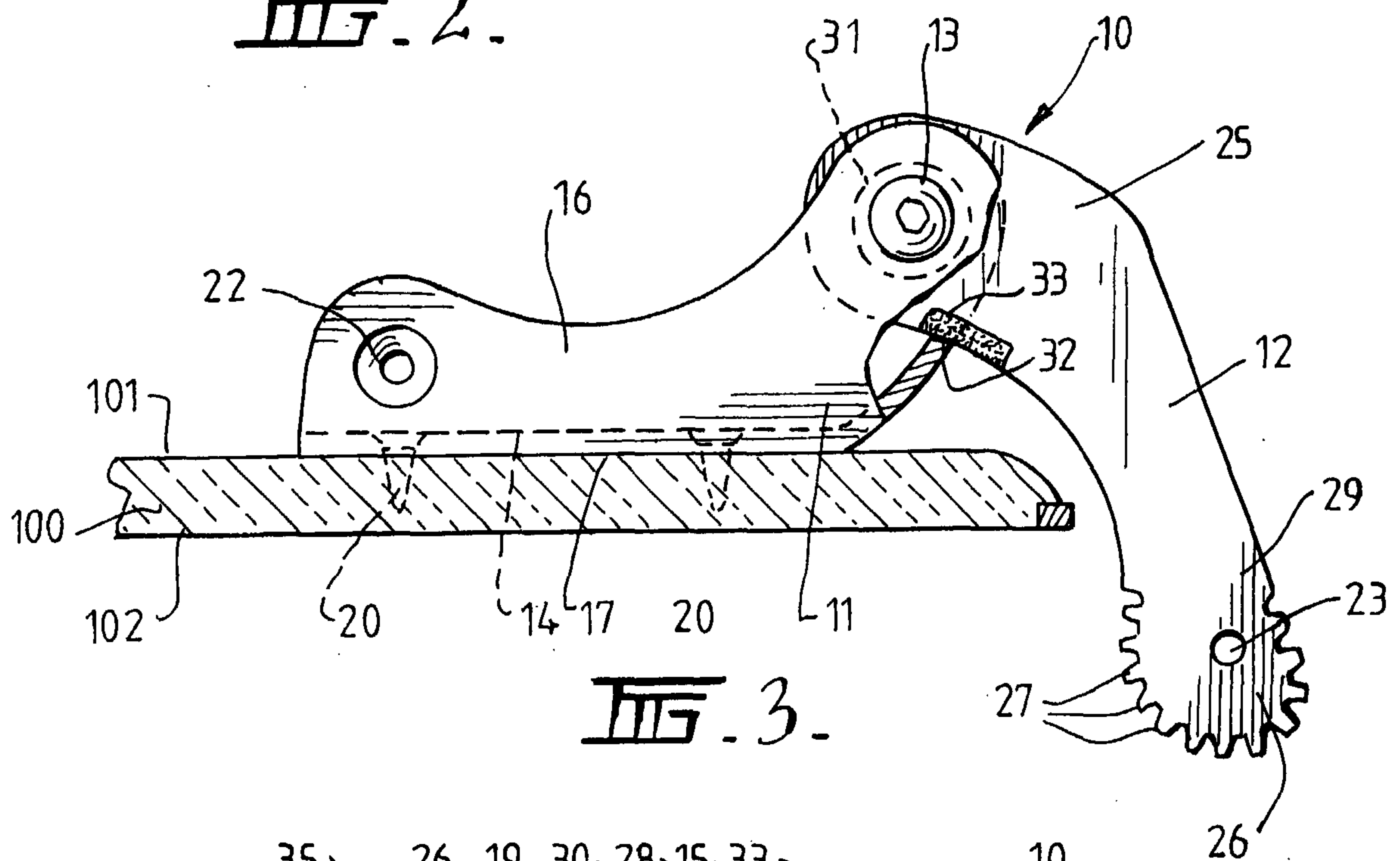


FIG. 3.

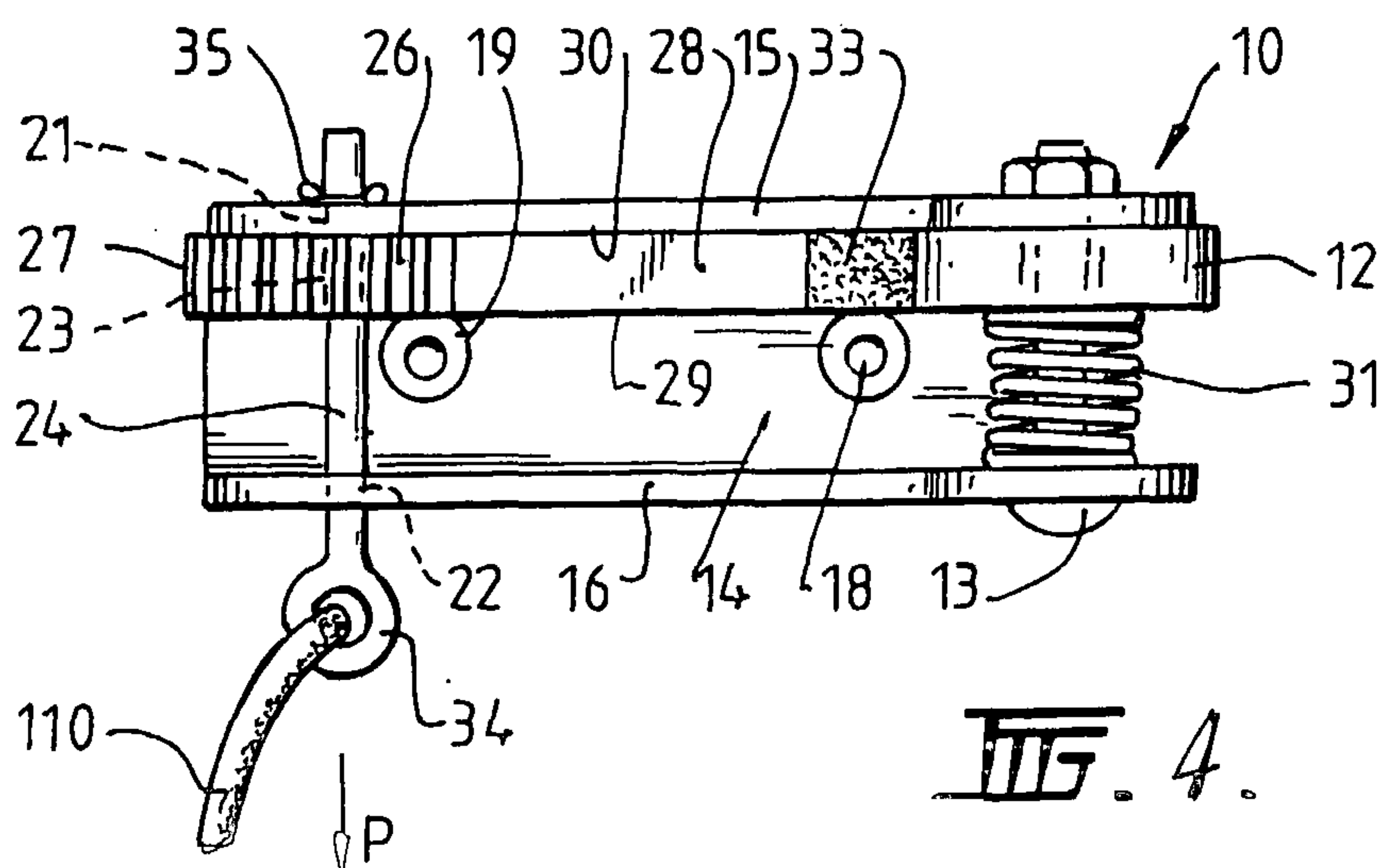
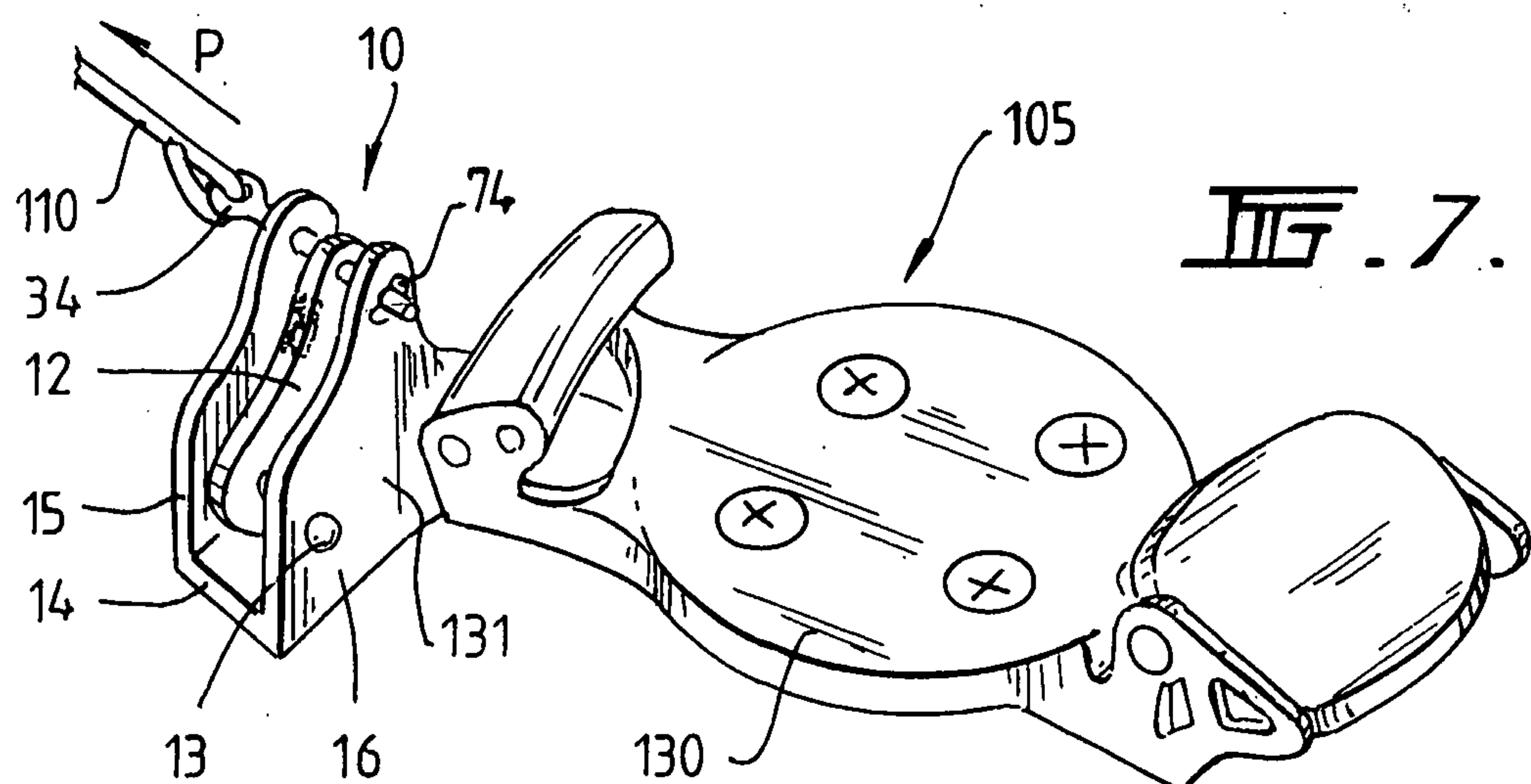
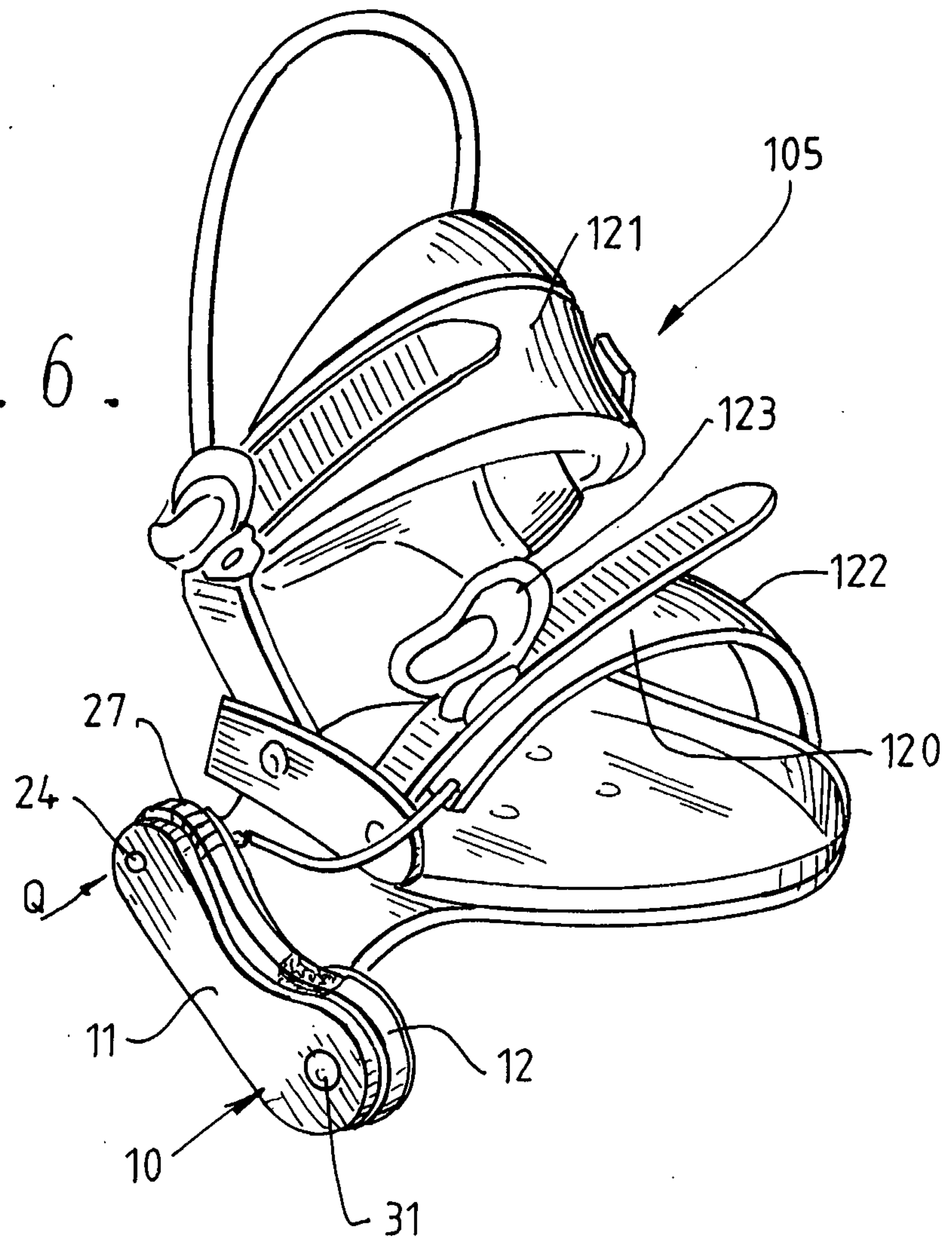
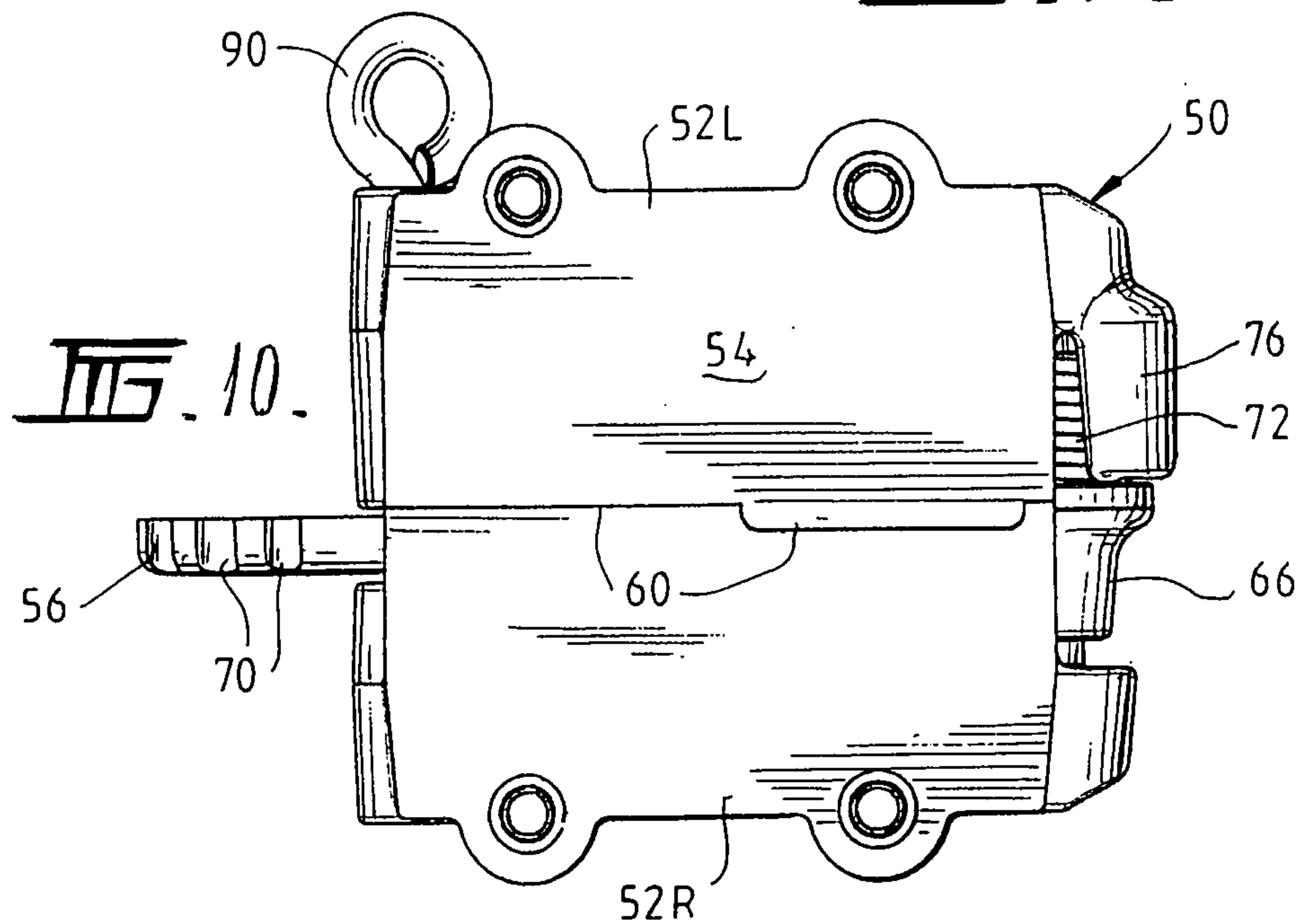
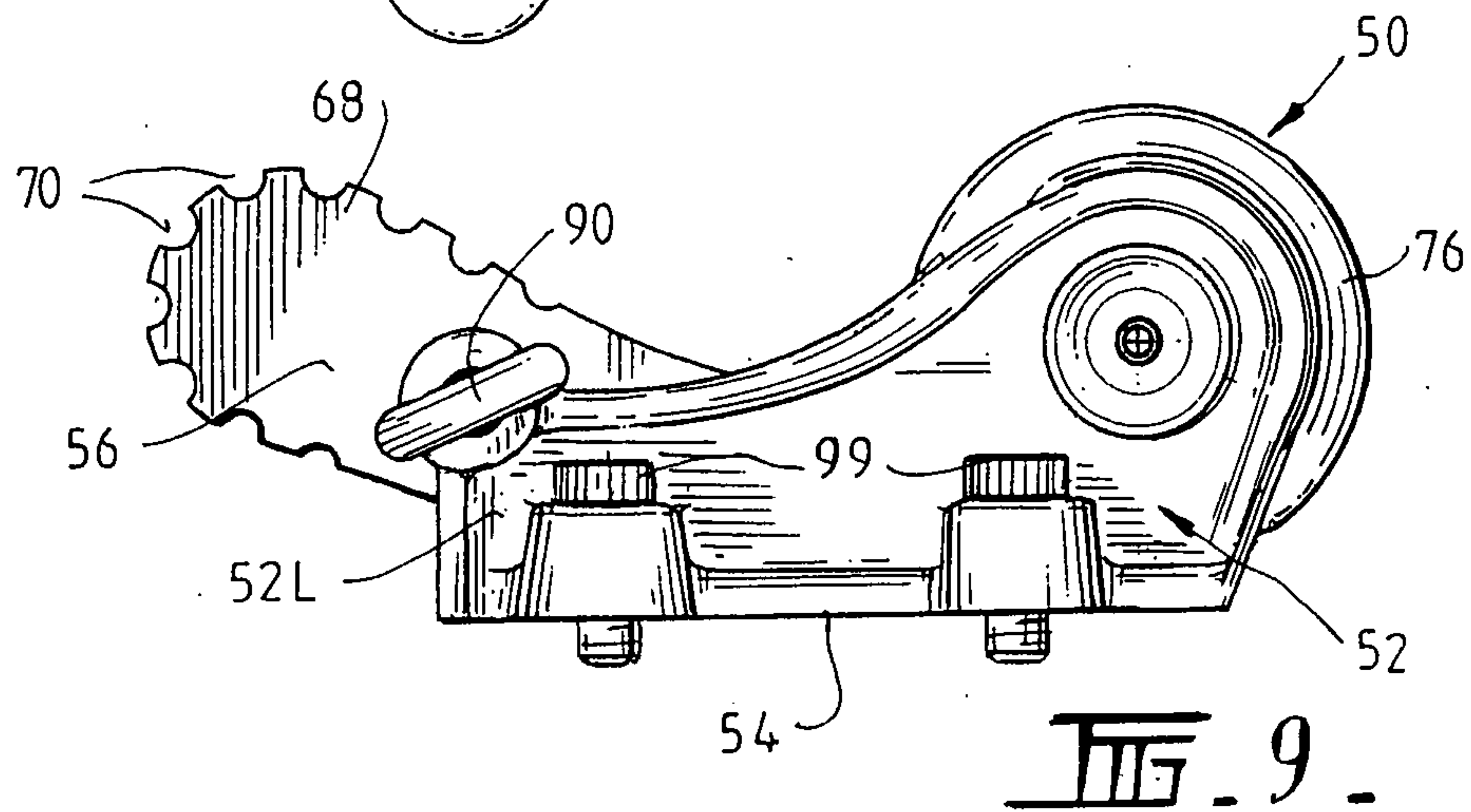
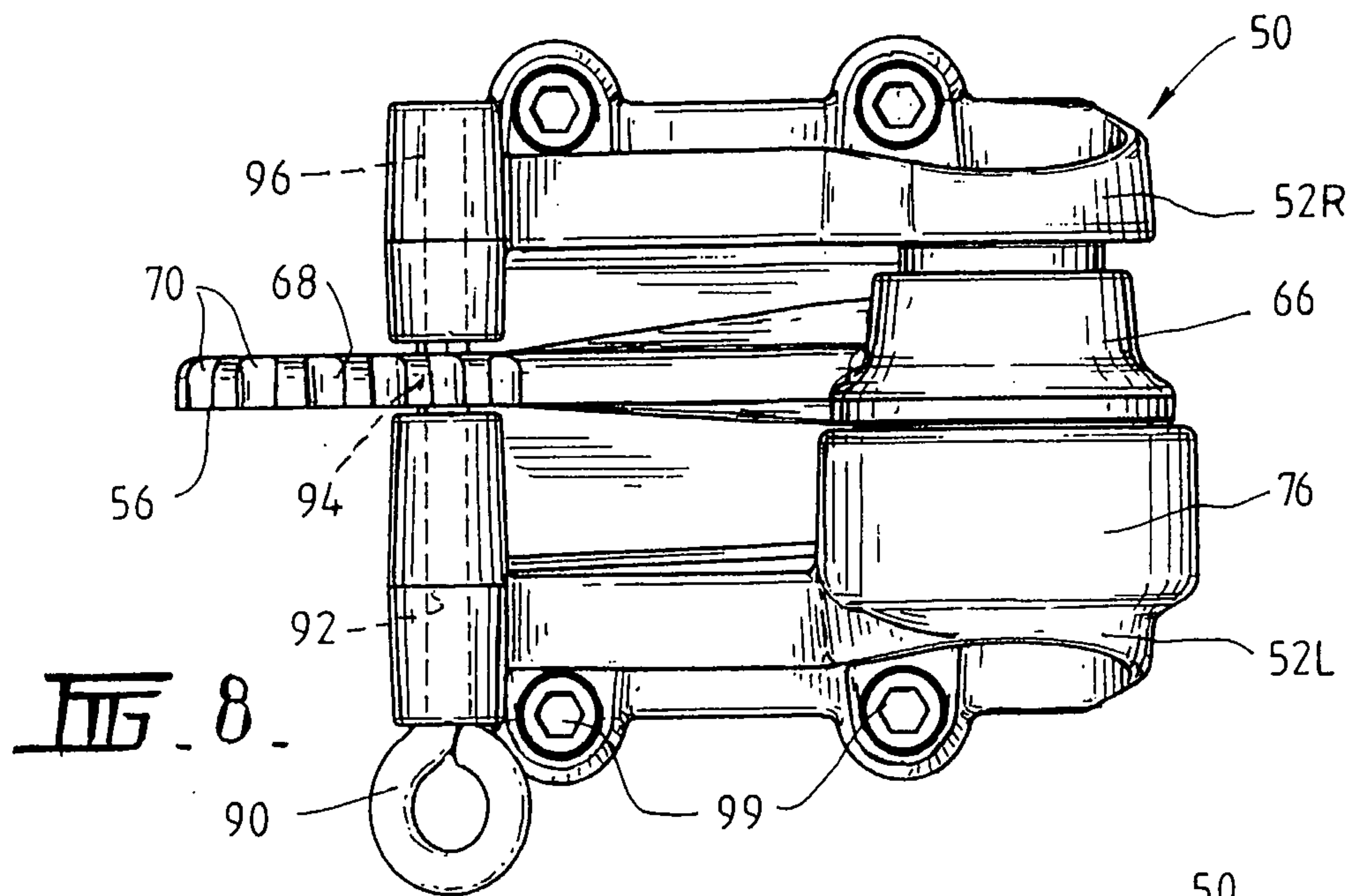
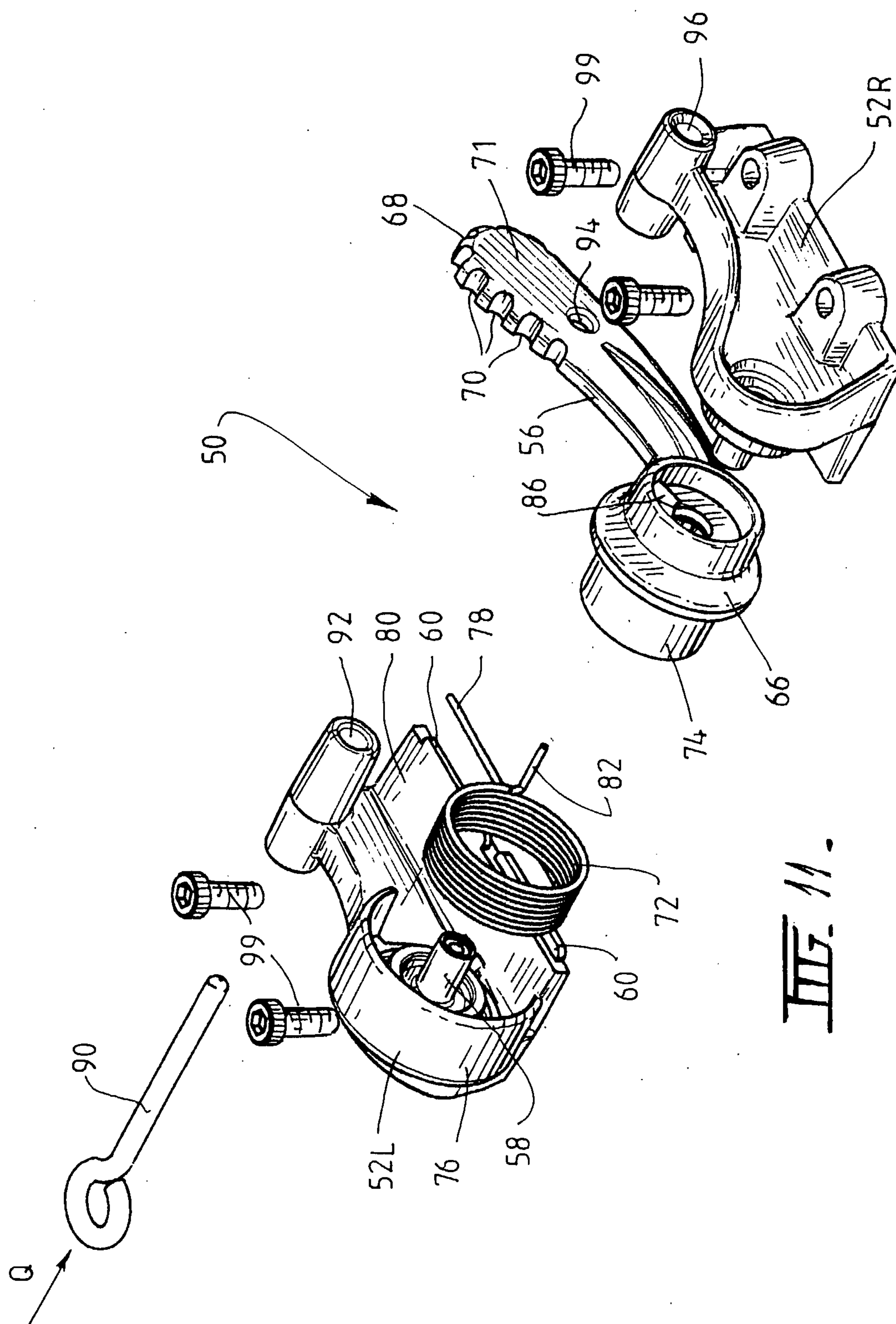


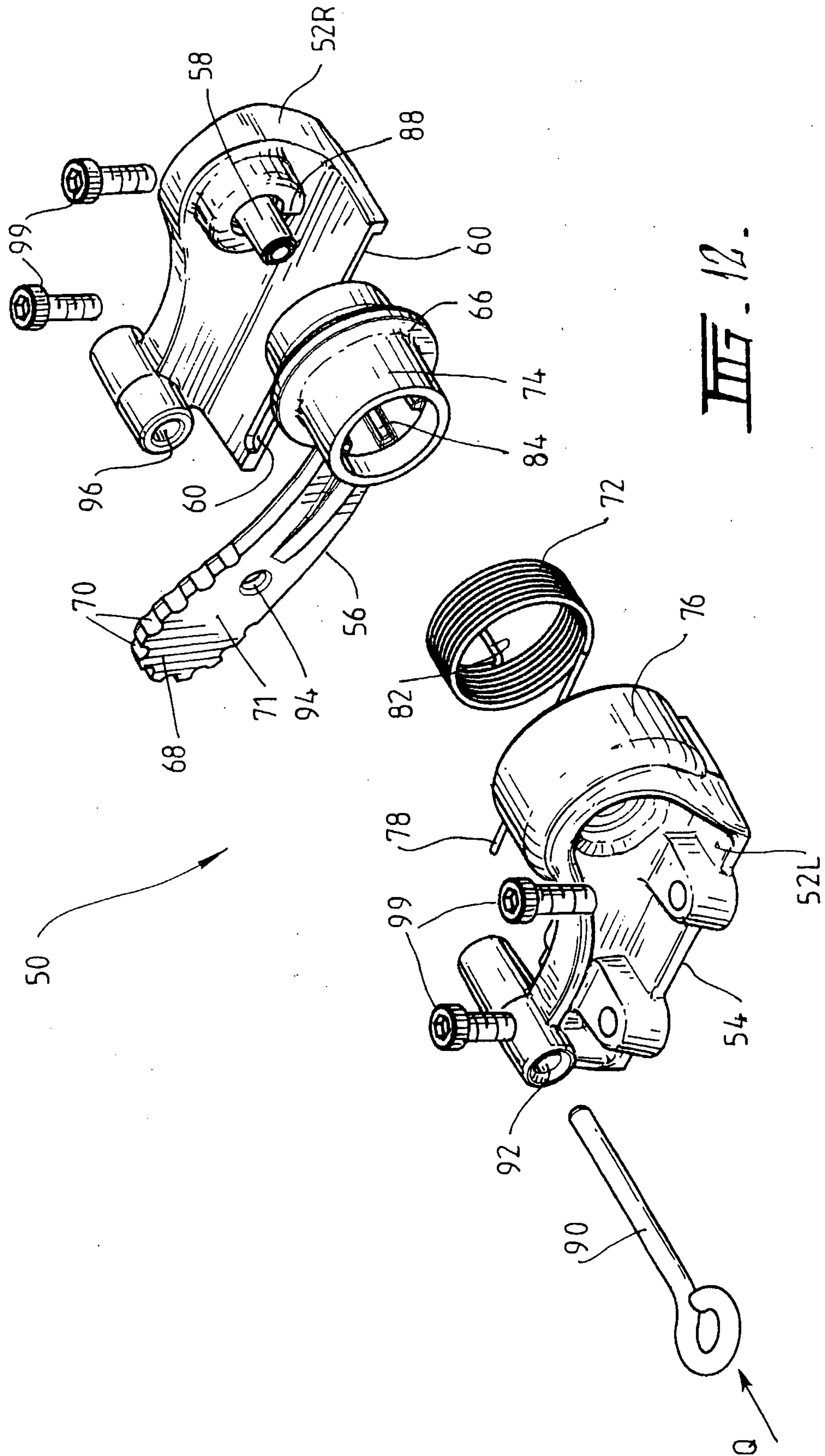
FIG. 4.

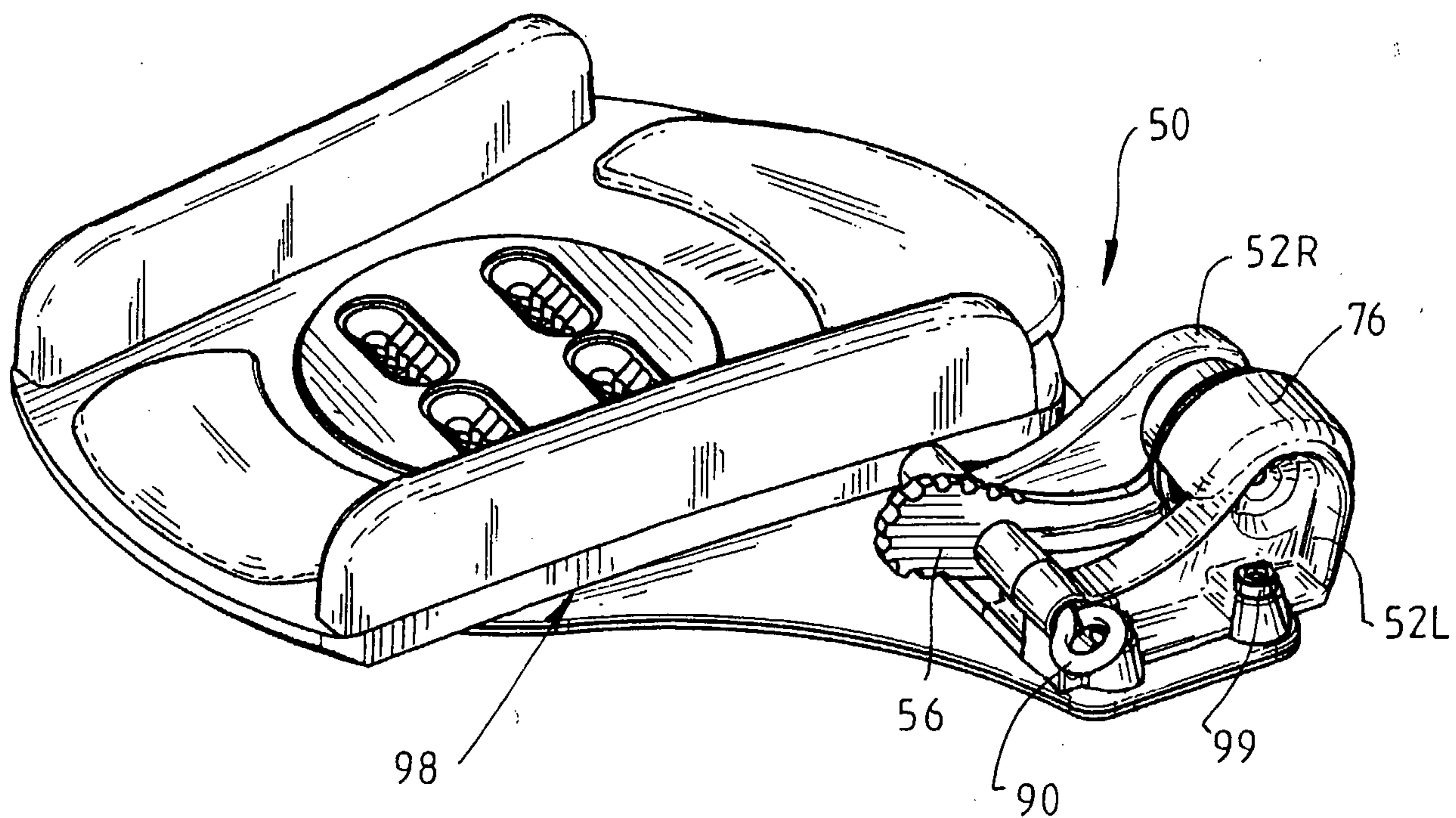
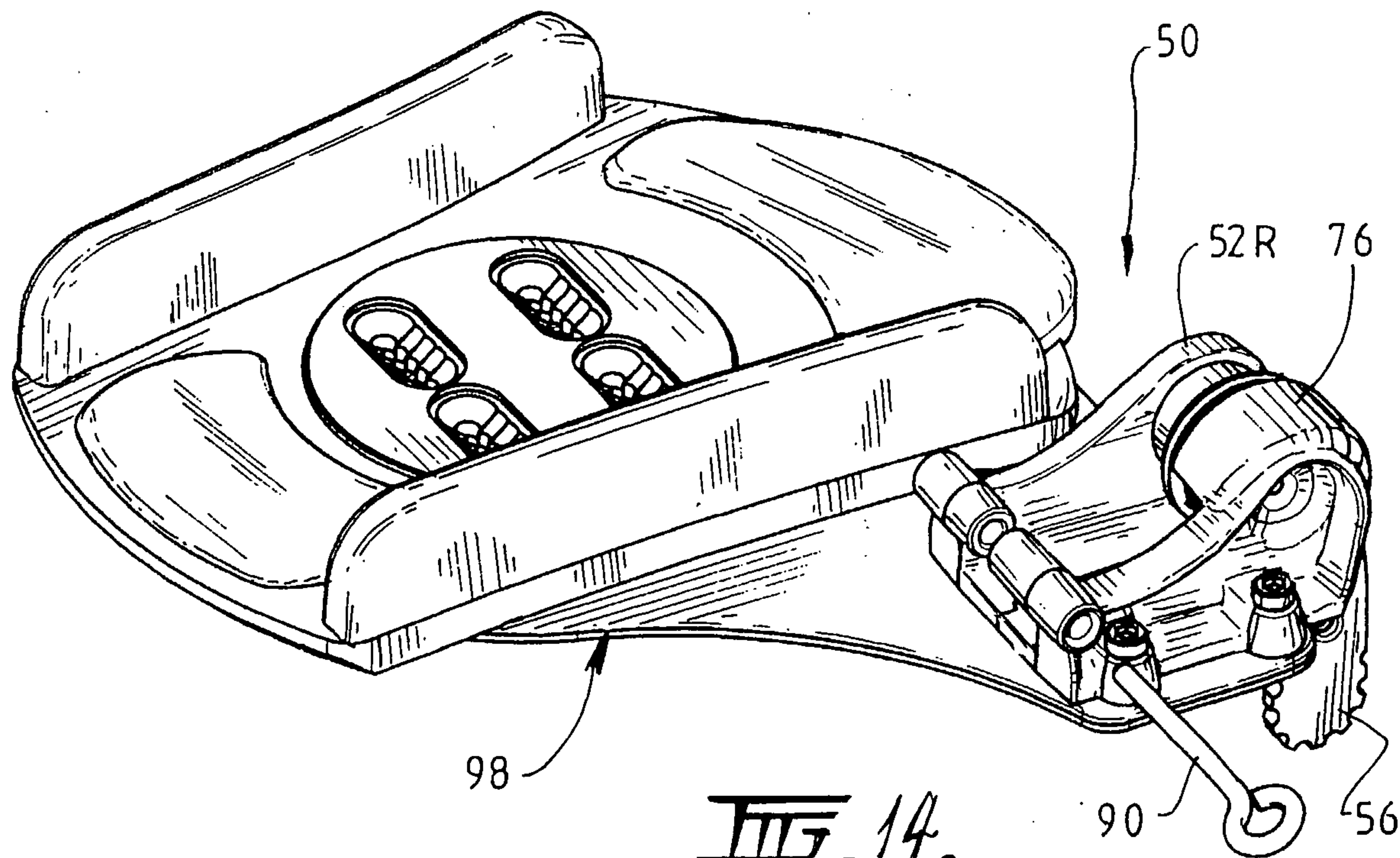
FIG. 6.









FIG. 13.FIG. 14.

