Final Diploma

Patent Examination Board

FD4 Infringement and Validity

Tuesday 12 October 2021

10:00 to 15:30 UK British Summer Time (GMT + 1 hour)

Examination time: 5 hours 30 minutes plus 10 minutes upload time

The 5 hours 30 minutes is allocated as follows:

10 minutes – Downloading and printing the question paper:
5 hours – Answering the questions:
20 minutes – Four screen breaks of 5 minutes each.

At 15.30 you MUST immediately stop answering the questions. You then have **10 minutes** in which to upload your Answer document to the PEBX system.

You MUST upload your Answer document to the PEBX system by 15.40. After 15.40 you will not be able to upload it and your examination will be void.

INSTRUCTIONS TO CANDIDATES

1. The whole assessment task is to be attempted.
2. The total number of marks available for this paper is 100.
3. You must use the Answer document for your answers.
4. Do not attempt to change the font style, font size, font colour, line spacing or any other pre-set formatting.
5. Start each part of your answer on a new page. Press the control key and the enter key simultaneously to begin a new page.
6. Do not state your name anywhere in the answers.
7. The scripts will be printed for marking purposes.
8. This question paper consists of **15 sheets**, including this sheet, and comprises:
   Assessment task (1 sheet)
   Client letter (1 sheet)
   Document A EP 3073322B (8 sheets including Claims (1 sheet) and drawings (4 sheets))
   Document B (2 sheets including drawings (1 sheet))
   Document C (1 sheet)
   A spare set of Claims (Document A) (1 sheet)
9. A spare set of Claims is also provided in your Answer document for you to use if you wish.

AT THE END OF THE EXAMINATION

10. Save your Answer document to your computer as a Word document. Convert the Answer document to a PDF. Check the Answer document to make sure that amended Claims are shown as you want in the Answer document. Upload the PDF-ed Answer document to the PEBX system.

Assessment task

Your client sends you the letter and documents listed on the Instructions to Candidates.

Your task is to prepare advice to your client on whether the attached granted patent may be enforced and defended.

You should prepare notes on which you would base your advice in which you:

a) **provide an opinion on infringement and validity, in the UK only;**
b) **identify other patent-related legal issues pertinent to the facts presented;**
c) **outline possible actions that may be taken to strengthen your client's legal position;**
d) **summarise the opinions formed in a) to c) above.**

Note the following:

a) You should accept the facts given to you and base your answer on those facts.
b) You should not make use of any other special knowledge that you may have of the subject matter concerned.

Allocation of marks

Construction: 22 marks
Infringement: 19 marks
Novelty: 26 marks
Inventive Step: 21 marks
Amendment and Sufficiency: 2 marks
Advice: 10 marks
Total: 100 marks

Client letter

Dear Patent Attorney,

I am the marketing manager of ClimbSafe. We manufacture safety equipment for sports, climbing, and search and rescue uses, and recently hit on a new idea of a simplified belay device. Our marketing material is enclosed (Document B). We showed this new device to retailers and demonstrated it at a climbing fair at the ExCel Centre in London in May 2019, shortly after we came up with the idea. Since then, it has become our best-selling item across the EU and also in the UK, which represents about a quarter of our retail market.

Our belay device is very simple to make, comprising a plate and a carabiner. Up to now we have been using a factory in Bulgaria to manufacture the devices. These are imported into the UK and distributed directly to retailers across the country. However, since Brexit, the import duties have made this arrangement economically unviable and we therefore recently decided to begin manufacturing the devices ourselves in Newport, Wales. We are due to begin manufacturing in December 2021 and will supply our UK-based retailers directly.

Imagine our shock, then, when we received a letter from a German company, Abseilen GmbH, who were also exhibiting at the same fair, drawing our attention to their patent EP 3073322 (Document A). This company is well known in the climbing world, especially for its abseiling devices. The device in their patent, however, has never really caught on, even though they marketed it very hard several years ago. They even went as far as to give it to all of the competitors, including me, to use at the World Indoor Climbing Championships in April 2014. I probably still have the device at home, somewhere.

At these championships, Abseilen GmbH held a demonstration of their device for use as a belay device in mountain rescue situations for lowering a climber on a stretcher. If I remember correctly, the setup was essentially the same as shown in Figure 1 of Document B with a dummy on a stretcher in the place of the fallen climber. They promoted it as a good choice for lowering both light and heavy loads, because the user can vary the level of friction provided by the device by adding or removing loops to increase or decrease the number of rails in the device. I recall discussing the device with other competitors, and we agreed that the use of multiple loops was fiddly and complicated.

The World Indoor Climbing Championships is the highlight of the Indoor Climbing year, and it is always well attended by spectators and is also streamed live on YouTube. Can we use a YouTube video as evidence? I think it is likely that the demonstration was also part of the YouTube broadcast.

Turning to the patent, I do not believe that we could be infringing this patent because the device it describes is a rope-descending device and we are making a belay device. Even though some belay devices can be used to abseil, our device cannot be used in this way. And anyway, the device in EP 3073322 seems to me to be nothing more than a modified carabiner brake, which would explain why it hasn't become popular. Carabiner brakes have been well known since the 1980s, but no one ever uses them now because there are much better options on the market, including our device, which is described in the enclosed marketing literature, and the Figure Eight descender described in Document C.

Please advise us regarding our position with EP 3073322. Is there anything we should consider before we go ahead with our plans to make the device in the UK?

Yours sincerely,

Alex Honnold
(*You review the patent and priority document and note that the priority document does not contain claim 5, or the passage on page 5, lines 30–36.*)

European Patent EP 3073322B

Priority date: 01.02.2014
Date of filing: 01.02.2015

Date of publication and mention of grant of the patent: 30.09.2017

The invention relates to devices which control the rate of descent of a load that is supported by a rope, but in particular, to a person who is connected to a rope, such as a mountain climber.

Mountain climbers commonly descend a mountain by abseiling, or rappelling, as shown in Figure 1. When abseiling, the climber, who is also the user of the rope-descending device, lowers themself using a support rope, an anchor, and a rope-descending device. To abseil, the climber 1 attaches a support rope or pair of ropes 2 to a natural feature such as a tree or rock outcrop 3, which serves as an anchor or alternatively, to an artificial anchor implanted in the mountain. The climber 1 then descends the mountain supported by the anchored support rope(s) 2. The support rope 2 is attached to the anchor 3 in a manner so that one or a pair of rope strands pass through a descending device 4 which is attached to the climber 1 or the user of the rope-descending device 4. Typically, the climber or user 1 will wear a harness (not shown) to facilitate connection to the rope-descending device 4. Such devices may also be used in other situations such as in the construction industry and by emergency services in rescue operations.

During descent, the level of friction between the rope and the descending device largely determines the rate (speed) of descent. Various factors affect the amount of friction desired by the user, including the dryness of the support rope; the temperature of the support rope, particularly in sub-zero temperatures; the diameter of the rope passing through the descender; the angle of the rope passing through the descender; and the weight of the load on the rope.

One rope-descending device is known as a carabiner brake, which is an assembly consisting entirely of carabiners. Carabiners are a type of clip or fastening device that is commonly used in climbing and other outdoor sports, and typically have a shape that defines a broadly oval loop with straight sides. One side typically has a spring-loaded gate that can be opened and closed to allow the carabiner to be connected to a rope or other carabiner. A carabiner brake typically consists of two carabiners [Figure 2]. In this device, one carabiner (A), functioning as a brake, passes around the middle of another carabiner (B) which serves as a frame. The support rope (C) is looped therethrough. A connecting carabiner (D) is used to connect the carabiner frame (B) to the climber. In use, the rope passes through the ‘frame’ carabiner (B) of the device, over the ‘brake’ carabiner (A), and back through the ‘frame’ carabiner (B).

A major disadvantage of this method is that assembly of the carabiner brake is time-consuming and cumbersome, disadvantages which are magnified in stressful or time-pressured situations. This type of assembly is also prone to twisting in use and, because the carabiners can move and twist freely with respect to each other, the device frequently jams during a descent and provides an inconsistent frictional force that is hard to control.

As a result of the safety concerns relating to this type of device and lack of practicality in use, the carabiner brake has largely been displaced by purpose-designed rope-descending devices, such as that of the present invention, and is no longer used.

Another device used as a rope descender is known as a ‘Figure Eight’ and is described in the document ‘Figure Eight Descender Device’ and shown in Figure 3.

A disadvantage of the conventional Figure Eight is that the support rope occasionally slips from the neck and slides to the top of the upper ring, thereby twisting the device and interlocking the trailing end of the support rope (28) with the length of support rope extending to the anchor (26) and stopping the climber’s descent until the accidental locking can be undone. This is because the line of action of the rope passes through different planes (in other words, the rope passes above and below the device as well as side to side) as it passes through the device, leading to twisting. At other times, the support rope may slip from the neck of the device and slide to the top of the upper ring, causing a sudden change in the frictional force provided by the device.

Another disadvantage is that the Figure Eight only provides one friction level to control the speed of descent. The rate of descent is largely dictated by the number and diameter of the rope(s) used, and the condition of the rope, i.e. whether the rope is wet, dry or frozen. Only a very small variation in the level of friction can be controlled by the user raising or lowering the trailing end of the support rope (28).

The present invention provides an improved rope-descending device that addresses the problems with the prior art.

The invention provides a rope-descending device for slowing the speed of descent of a load on a rope, comprising a ring defining an inner aperture, said aperture sized to accommodate the rope, a rail extending across the width of the aperture, said rail adapted to provide a force on the rope, and means for connecting the ring to the user of the rope-descending device.

Figure 1 shows a user of a rope-descending device abseiling.

Figure 2 shows a typical prior art carabiner brake made up of three carabiners, attached to a user with a further carabiner.

Figure 3 depicts a typical prior art Figure Eight rope-descending device.

Figure 4 is a plan view of the rope-descending device of the invention.

Figure 5 is a side view of the rope-descending device of the invention with (a) one, (b) two, and (c) three rails.

One embodiment of the rope-descending device (1) of the invention illustrated in Figure 4 includes a ring (10), a neck (20), and a plate (30). The ring (10) defines an aperture (12) with raised straight sides (16, 17) and rounded ends (19’, 19”). A rail, defined by a loop structure (22), is provided across the aperture (12), perpendicular to the raised sides (16, 17).

One end (26) of the support rope (24) extends from the rope-descending device (1) to the anchor (not shown). The trailing end (28) of the support rope (24) is controlled by the user and may be raised or lowered to alter the angle of the bend in the rope (24) as it leaves the rope-descending device (1). In the device of the invention, the path of the rope (24), when viewed in the plan view of Figure 4, is essentially linear as it passes through the device (1)

from end (19') to end (19"), such that the path of the rope bends through less than 90 degrees from the axis of the direction of force applied to the rope by the load (the 'line of action').

A particular advantage of the rope-descending device of the invention is the ability to provide a range of friction levels for controlling the rate of descent of the load on the rope. The level of friction of the rope with the descending device can be altered by providing the device with one, two, three, or more rails extending across the width of the aperture (i.e. from side to side). The user of the device can select the level of friction needed in the circumstance by passing the rope over one, two, or more rails depending on the diameter of the rope, the weight of the load and the desired speed of descent.

As shown in Figure 4, a loop (22) is provided around the ring (10), such that the loop extends across the width of the aperture (12), defining a rail. The loop (22) is configured such that it can slide in an end-to-end direction relative to the ring (10) but cannot twist. The number of loops can be altered to provide one or more rails across the aperture (12). As the number of rails increases, the unobstructed space in the aperture (12) decreases, forcing the rope (24) to take a more constrained, or bent, path. As the relative size of the aperture decreases with increasing rail number, the support rope (24) will traverse the rope-descending device (1) with a sharper bend relative to the ring (10) and rail (22) [Figures 5a–5c], thereby increasing surface contact of the rope (24) with the rail(s) (22), with a corresponding resulting increase in frictional force exerted on the rope (24). An increase in the force exerted by the rail(s) (22) on the rope (24) leads to a slower rate of descent. Leaving aside the space occupied by the rope (24), a maximal level of friction is achieved when the combined width of the rails (22) occupies substantially all of the aperture [Figure 5c].

The plate (30) has two openings to accommodate a means to attach the device (1) to the user. In one embodiment, the attaching means is a carabiner. In another embodiment, the attaching means may be a rope or other suitable means to connect the device to a user via the user's harness.

In an alternative embodiment, the rail is integrally formed with the ring. In this embodiment, the entire rope-descending device may be manufactured as one unit. Additional loops can be used with the integrally formed rail to alter the level of friction provided by the device.

The invention also provides a method of braking a load on a rope using the rope-descending device of the invention, the rope running through a rope-descending device over a rail, said rail creating a force on the rope dependent on the weight of the load when a load is suspended, characterised in that the rope traverses the rope-descending device in a linear manner. The method of the invention is particularly useful for lowering a load while the user remains stationary, using the device of the invention to provide a braking force as a belay device.

In use, the support rope traverses the rope-descending device of the invention in a linear fashion such that, even though the support rope bends to pass over the rails(s), the line of action of the rope does not deviate to any notable degree from a linear path as it passes through the device from end-to-end, at least in a side-to-side direction. As can be seen in Figure 4, as the support rope (24) runs through the descending device (1) of the invention, the rope (24) also bends through less than 90 degrees in a side-to-side direction from the axis of the direction of force applied to the rope by the load (the 'line of action'). The interaction of the support rope with the rope-descending device of the invention does not require the sharp

turns or changes in a side-to-side direction relative to the loading force applied to the rope, such as seen with the use of the prior art Figure Eight device. For example, in Figure 5a, the rope (24) bends sharply round the single rail (22) yet the linear end-to-end path of the rope (24) in plan view (see Figure 4) means that twisting is minimised. The present invention therefore minimises problems when the support rope is frozen and minimises problems with twisting and jamming that are caused by the multiple changes in direction as the rope passes around the Figure Eight device.

CLAIMS

1. A rope-descending device for slowing the speed of descent of a load on a rope, comprising:
a ring defining an inner aperture, said aperture sized to accommodate the rope;
a rail extending across the width of the aperture, said rail adapted to provide a force on the rope; and
means for connecting the ring to the user of the rope-descending device, wherein the rail and the aperture are configured such that the path of the rope through the rope-descending device is linear.

2. A rope-descending device according to claim 1, wherein the rail is integrally formed with the ring.

3. A rope-descending device according to claim 1 or claim 2, wherein the device comprises 2 to 4 rails.

4. A rope-descending device according to claim 3, wherein the width of the rails occupies substantially all of the aperture.

5. A method of braking a load on a rope using the device of claims 1–4, said method comprising:
securing the rope-descending device to a user;
securing one end of the rope to a load;
adding one or more rails extending across the width of the aperture of the rope-descending device, said rails adapted to provide a force on the rope;
passing the rope through the device in a linear manner; and
lowering the load, whereby the user controls the rate of descent of the load by varying the level of friction provided by the device.

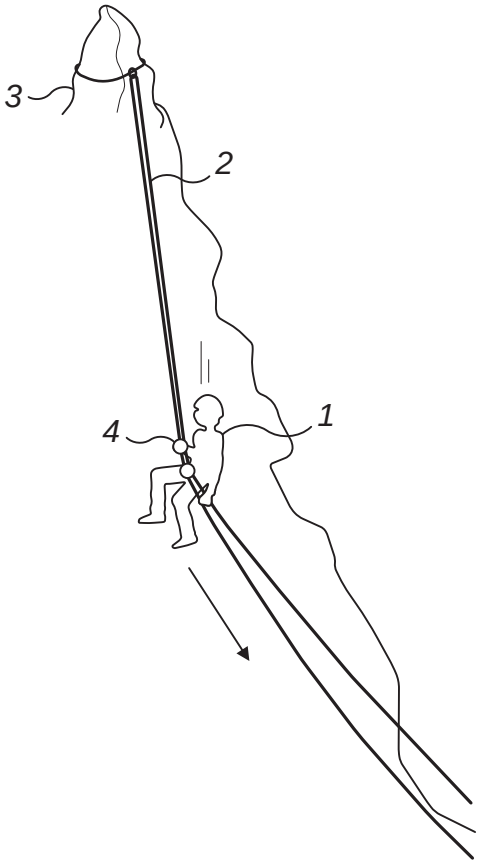


Figure 1 – Prior Art

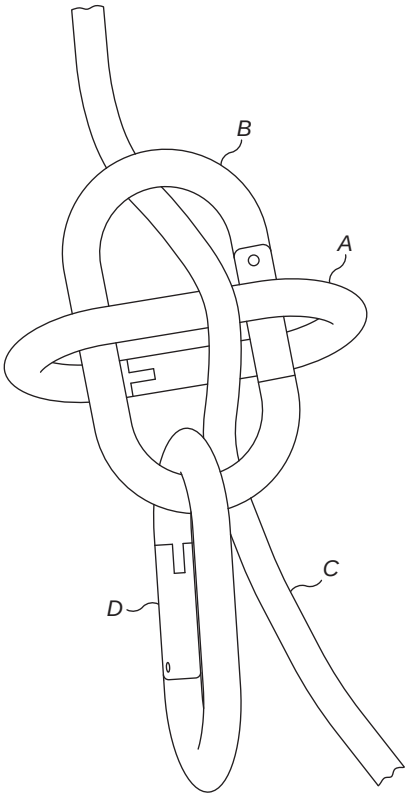


Figure 2 – Prior Art

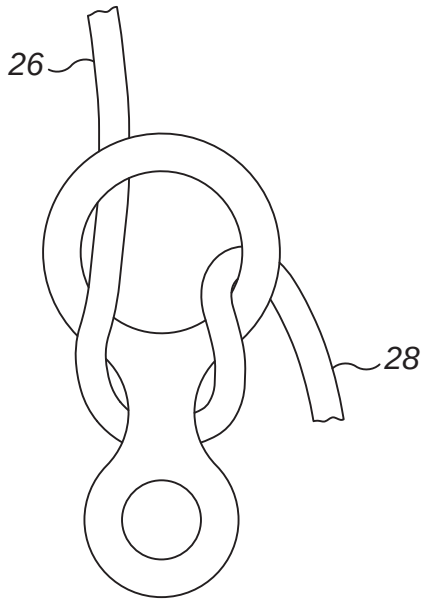


Figure 3 – Prior Art

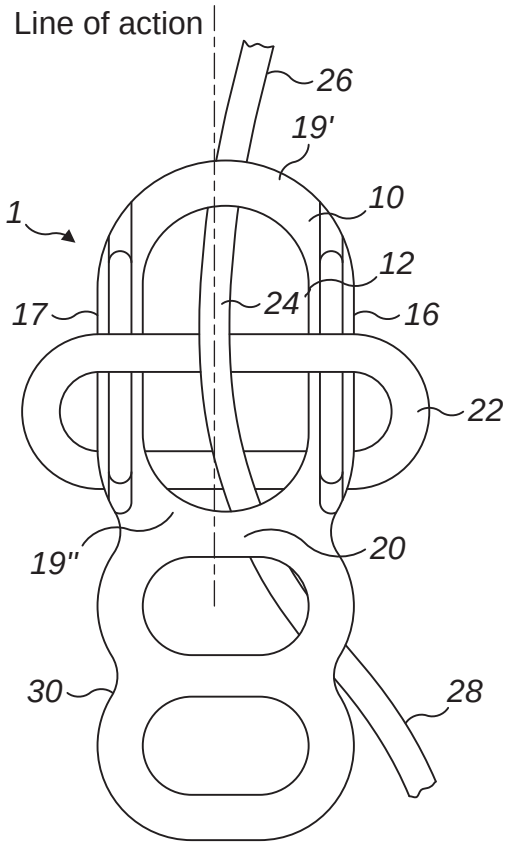


Figure 4

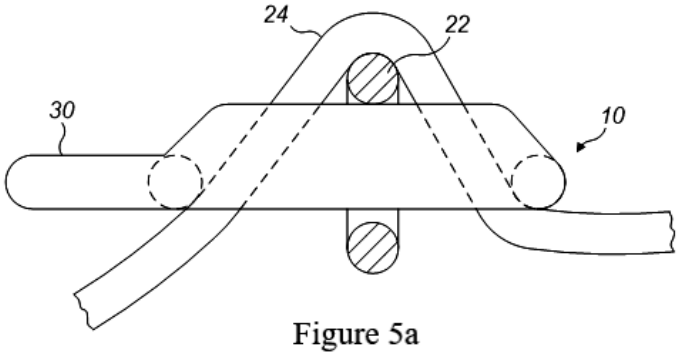


Figure 5a

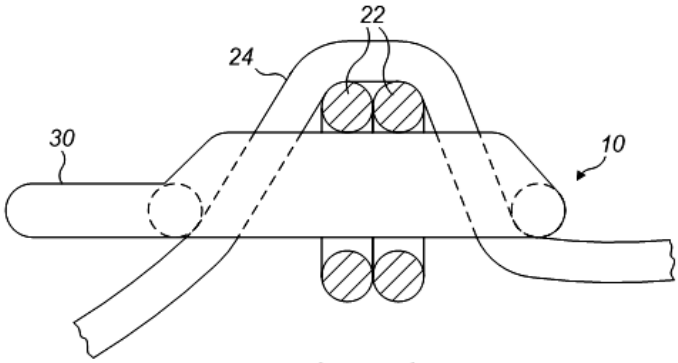


Figure 5b

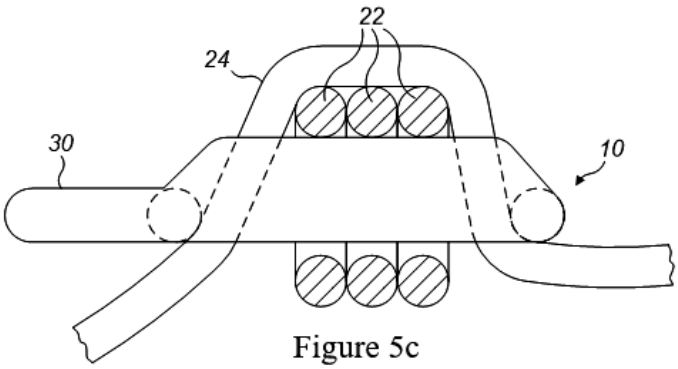


Figure 5c

Document B

NEW BELAY DEVICE

We have developed a new mechanical rope brake, for use as a belaying device.

A belay device is a mechanical piece of climbing equipment used to control a rope during belaying. It is designed to improve belay safety for the climber by allowing the belayer, or user of the belay device, to support or lower the climber with minimal physical effort. With the right belay device, a smaller, weaker climber can arrest the fall of a heavier partner. Belay devices act as a friction brake, so that when a climber falls with any slack in the rope, the fall is brought to a stop. After the falling climber has been brought to a stop, they can be lowered to safety by paying rope steadily through the belay device, using frictional force to control the speed of descent of the fallen climber. The fallen climber is lowered by the user of the belay device, who is generally positioned above or below the fallen climber. Figure 1 shows an example of a user of a belay device on the ground lowering a fallen climber. The belayer will be anchored to the ground with a separate rope (not shown here for clarity) and controls the descent of the fallen climber by paying the rope through the belay device. Some belay devices can also be used as descenders for a controlled descent on a rope by abseiling or rappelling.

Typically, when the rope is held outward, away from the body, it moves relatively freely, so the belayer can take up or pay out slack. When the rope is brought backward, to the side of the body, the rope is forced into tight bends and rubs against the device and/or against itself, allowing the belayer to arrest the descent of a climber in the case of a fall. This rubbing slows the rope.

The new belay device consists of a small metal plate with one or two slots that allow a loop of rope to pass through to a carabiner and back out of the same slot. This carabiner is clipped to the belayer, who is then able to control the movement of the rope through the belay device at will. The carabiner forms part of the friction generating mechanism, as the rope bends around and rubs against the carabiner as well as the belay plate.

Some plates have two slots for ropes (see Figure 2). The slots could be different sizes for different diameter ropes, e.g. 9mm and 11mm. A smaller hole is also present for accessory cord to carry the device and attach the device to the climber so that it cannot be dropped or lost. The accessory cord is also used to store the carabiner, which is an essential part of the device, so that it does not get separated from the plate. Figures 3a and 3b shows a plan view of a single slot plate (Figure 3a), and a side section of the single slot plate with a rope and carabiner installed (Figure 3b). These plates are lightweight, being forged from aluminium alloy in a round disc shape. Other shapes are also available.

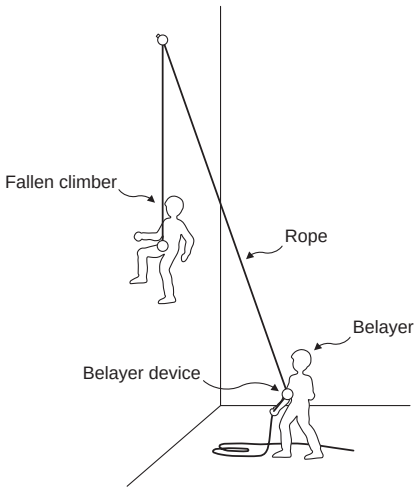


Figure 1

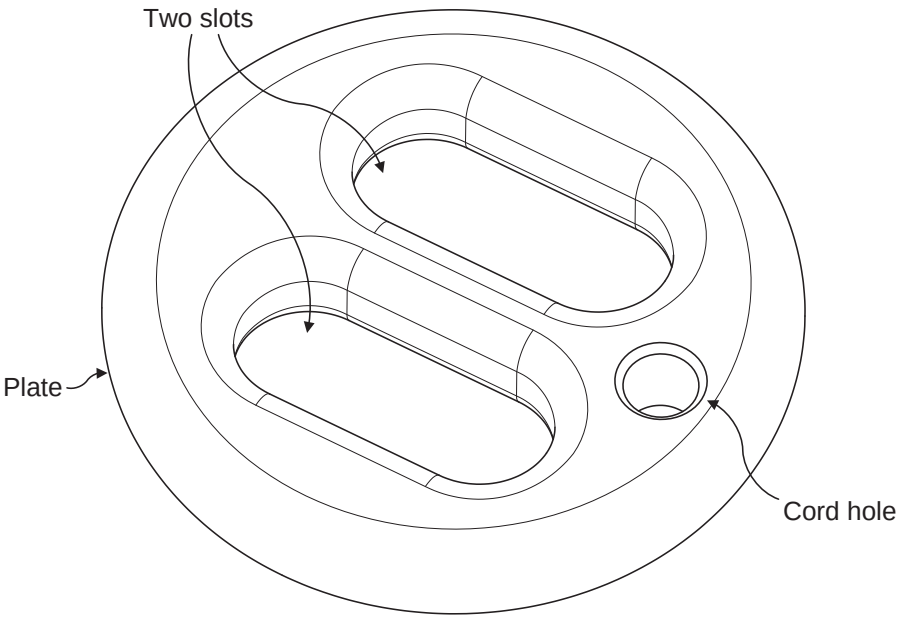
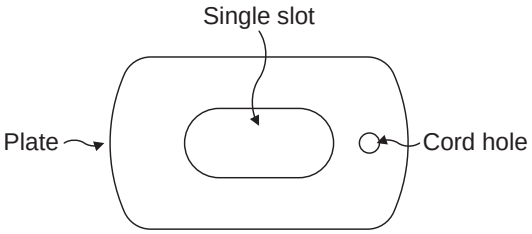


Figure 2

Figure 3a



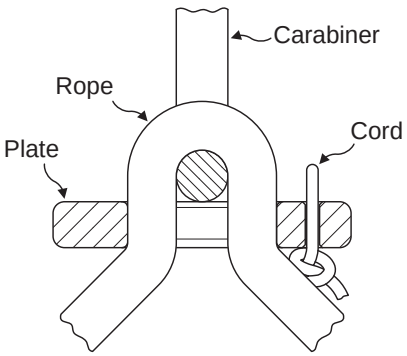


Figure 3b

Document C

Figure Eight Descender Device

The Figure Eight is a rope-descender device used by climbers for abseiling. The device is generally formed of cast aluminium, with an upper and lower ring connected by a neck.

As shown in Figure 1, the Figure Eight (2) consists of a pair of rings (3, 4) connected by a neck (5). As the name suggests, the device has the appearance of a numeral '8'. The upper ring (3), through which the support rope is passed, is considerably larger in diameter than the lower ring (4). The lower ring serves as a point for connecting the rope descender to the climber, usually by connecting to the harness of the climber.

As shown in Figure 2, the climbing rope (24) is attached to the Figure Eight by passing a loop of the rope up through the larger hole (6) of the upper ring (3) and then pulling it over and then under the lower ring (4) so that the rope is secured around the neck (5) of the Figure Eight. One end of the rope (24) remains connected to an anchor point (not shown) whereas the free end of the rope (28) is looped around the Figure Eight and is grasped by the climber to control his rate of descent.

The major factor in controlling the climber's rate of descent is the amount of friction of the rope with the descending device. In the Figure Eight, the amount of such friction is determined by the size of the rope used, as this alone will determine the area of surface contact between the rope and the Figure Eight. The level of friction can be controlled, to a limited extent, by raising and lowering the free end of the rope (28) to change the angle of contact with the neck of the descender.

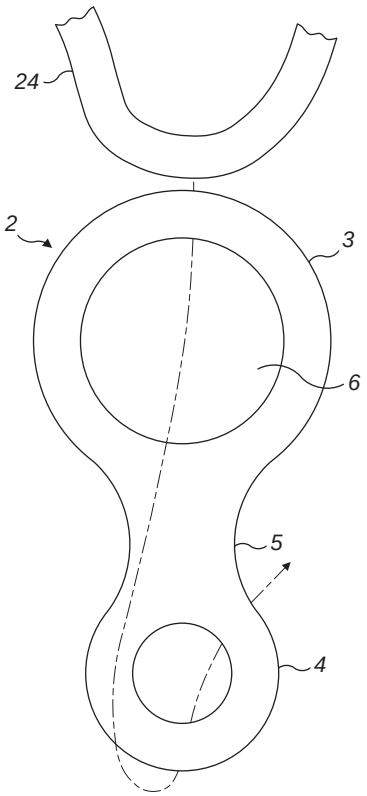


Figure 1

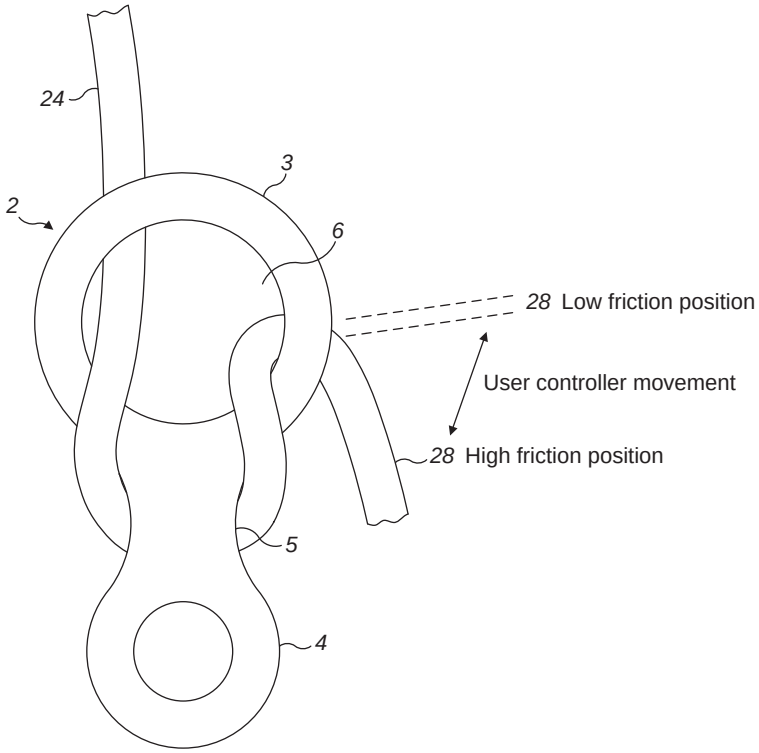


Figure 2

Spare set of Claims

CLAIMS

1. A rope-descending device for slowing the speed of descent of a load on a rope, comprising:
a ring defining an inner aperture, said aperture sized to accommodate the rope;
a rail extending across the width of the aperture, said rail adapted to provide a force on the rope; and
means for connecting the ring to the user of the rope-descending device, wherein the rail and the aperture are configured such that the path of the rope through the rope-descending device is linear.

2. A rope-descending device according to claim 1, wherein the rail is integrally formed with the ring.

3. A rope-descending device according to claim 1 or claim 2, wherein the device comprises 2 to 4 rails.

4. A rope-descending device according to claim 3, wherein the width of the rails occupies substantially all of the aperture.

5. A method of braking a load on a rope using the device of claims 1–4, said method comprising:
securing the rope-descending device to a user;
securing one end of the rope to a load;
adding one or more rails extending across the width of the aperture of the rope-descending device, said rails adapted to provide a force on the rope;
passing the support rope through the device in a linear manner; and
lowering the load, whereby the user controls the rate of descent of the load by varying the level of friction provided by the device.