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Claims 16 to 28 are deemed to be abandoned due to non-payment of the claims fees (Rule 45(3) EPC).

(54) **Hurdle**

(57) Obstacle device, particularly designed as jumping obstacle for animal sports, particularly equestrian sports, comprising a support and an obstacle to be supported by the support, wherein the obstacle comprises at least one obstacle member which with respect to the support can be moved between an operative position in which the obstacle has its integrity as an obstacle and a lower collapsed position in which the integrity of the obstacle is at least partially ended, wherein the device furthermore comprises holding means for pulling, particularly tensioning, the obstacle member to the support in order to hold it in the operative position, wherein the holding means also comprise releasing means for on an impact exerted on the obstacle member by a user of the obstacle device, lowering, particularly ending, the pulling force, in order to allow, particularly immediately allow, said obstacle member to move to the collapsed position.

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Description

BACKGROUND OF THE INVENTION

[0001] The invention relates to a device for forming a hurdle or an obstacle, particularly for animals and persons, such as for instance a jumping obstacle for equestrian sports.

[0002] Obstacles form a basic part of the equestrian jumping sports. On either side of the course to be traversed supports have been positioned that are provided with support surfaces on which rails rest, such that when a horse contacts the rail with a certain force, the rail comes from the support surface and it falls down onto the ground.

[0003] After the horse has passed the obstacle has to be reconstructed for a next jump, by the same horse or by a next horse. In order to save time it is common to post a person at the obstacle to do so. However, this costs (expensive) manpower.

[0004] Another example are the hurdles in track and field events. The hurdles fall down when an athlete contacts them in a certain way. Prior to a next passage the hurdle has to be put upright again, to which end personnel has to be kept available.

[0005] In both types of obstacles there is a risk that either horse or human gets injured on the obstacle, in case it does not fall down fast enough.

[0006] From DE 298 18 695 an obstacle bar to be laid on supports is known, which obstacle bar is built up from segments that by means of magnetic force, spring force or in a mechanical way are detachably connected to each other. In this way on impact by a horse the failure force is lowered. After collapsing of the bar the horse rider has to reconnect the segments to each other and place them on the supports.

SUMMARY OF THE INVENTION

[0007] It is an object of the invention to provide a device of the type mentioned in the preamble, which after collapsing is can easily and/or quickly be built up again.

[0008] It is an object of the invention to provide a device of the type mentioned in the preamble, which can easily collapse.

[0009] It is an object of the invention to provide a device of the type mentioned in the preamble that has a low risk of injury.

[0010] For achieving at least on of these objects the invention, from one aspect, provides an obstacle device, particularly designed as jumping obstacle for animal sports, particularly equestrian sports, comprising a support and an obstacle, particularly elongated obstacle, to be supported by the support, wherein the obstacle comprises at least one obstacle member which with respect to the support can be moved between an operative position in which the obstacle has its integrity as an obstacle and a lower collapsed position in which the integrity of the obstacle is at least partially ended, wherein the device furthermore comprises holding means for pulling, particularly tensioning, the obstacle member to the support in order to hold it in the operative position, wherein the holding means also comprise releasing means for on an impact exerted on the obstacle member by a user of the obstacle device, lowering, particularly ending, the pulling force, in order to allow, particularly immediately allow, said obstacle member to move to the collapsed position.

[0011] There is question of an impact exerted by the user when the person or animal that has to pass the obstacle, particularly has to move over it, hits the obstacle member to an undesirable degree with the body, such as the legs of a horse or person jumping over the obstacle, or the chest of the horse or the body of a person. The obstacle will on said impact due to (sudden) lowering, effected by the releasing means, of the force with which the obstacle member is pulled to the support, change its condition wherein the earlier integrity or shape of the obstacle is ended and thus the resistance is ended or considerably reduced. In that way the risk of injury is strongly reduced. When building up, the holding means are activated again. The releasing means preferably are designed for on impact immediately ending the pulling force. Particularly under the influence of the impact and gravity, the obstacle member can move fast to a lower collapsed position.

[0012] The holding means may be adapted for permanently connecting the obstacle member and adjacent parts of the device, particularly the support, to each other, as a result of which some connection is preserved between the parts, which facilitates the (automatic, see below) re-erection of the obstacle. This particularly applies when several obstacle members are connected to each other in series by means of reconstructable collapsing connections.

[0013] The holding means may comprise at least one tensioning element, such as a cable, rope and the like, for in the operative position tensioning the obstacle member to the support, wherein the device preferably comprises tensioning means for tensioning the tensioning element. The releasing means may be adapted for releasing a length of tensioning element, particularly a limited length. Limiting the released length, for instance by means of a stop on the tensioning element, facilitates the reconstruction of the obstacle. The tensioning means may comprise a drive, particularly a drive to be actuated by the device, and particularly provided with a remote control, in which way personnel can be economized on. In case of a horse rider-horse combination the horse rider is able to activate the drive from horseback for rebuilding the obstacle.

[0014] In a safe embodiment the tensioning element extends through the obstacle.

[0015] The holding means may comprise, preferably spring-loaded, locking means, for securing the tensioning means in a tensioned condition, wherein the releasing means are configured for ending the locking when the

pulling force is exceeded to a predetermined degree. They therefore also act as trigger elements, which on impact immediately cause the relaxation.

[0016] Preferably the releasing means are adjustable for adjusting the predetermined degree of exceeding the pulling force with which the locking is ended, so that the forces to be expected on impact by a user of the obstacle can be optimally adjusted to.

[0017] In a simple embodiment the locking means comprise a blocking part, such as a blocking ball or blocking pin, which directly or indirectly engages onto said tensioning element and on said impact is operated to end the locking, for instance on a cable pulley on which a tensioning cable as tensioning element is attached with one end and with which the cable can be tensioned. The releasing means and the locking means can in that case at least partially coincide as regards parts, when the blocking part is spring-biased and it is pressed in for release of the tensioning element when a threshold value in the pulling force in the tensioning element is exceeded.

[0018] Particularly when applied in jumping sports the holding means, particularly the locking means and releasing means, can be designed for on an impact oriented transverse to the pulling force on the obstacle member, releasing said obstacle member in order to let it assume the collapsed position.

[0019] In the operative position the obstacle member can be connected to an adjacent part of the device by means of a collapsing connection. The collapsing connection can in that case form a potential rotary connection for enhancing the collapsing motion. Erecting the device from the collapsed position is enhanced when the obstacle member and the adjacent part of the device are provided with first orienting means cooperating with each other for mutually orienting in the operative position.

[0020] In a further embodiment the device according to the invention is provided with second orienting means for with respect to the support adjusting the orientation of the obstacle member, so that, in an example as obstacle for equestrian jumping sports, an arrangement such as Calavetti with horizontal obstacle rail and an arrangement such as the so-called cross-rail is possible.

[0021] In many uses the obstacle member will be substantially elongated and the pulling force is substantially in line therewith, particularly generates a normal force in the obstacle member.

[0022] The obstacle may in an embodiment comprise one obstacle member. In an embodiment of the obstacle as rail said rail may for instance comprise a fixed member and a collapsing (obstacle) member, that are in line with each other. It is also possible that the entire rail, or almost the entire rail, form the (single) obstacle member of the obstacle. It is also possible that the obstacle comprises a number of obstacle members pulled against one another in series by the holding means, particularly tensioning means.

[0023] In a compact embodiment the device according to the invention comprises two obstacles that are not in line with each other and have one obstacle member each, wherein both obstacle members have each been pulled against a common support by holding means, and the locking means and releasing means are jointly active on the holding means of both obstacle members. In that case the tensioning means can also be common to a great extent, as well as the control device for them.

[0024] From a further aspect the invention provides an obstacle device comprising a support and an obstacle to be supported by the support, wherein the obstacle comprises a number of segments placed adjacent to each other and against each other, wherein the device further comprises holding means that can be activated and deactivated for with a holding force keeping the adjacently situated segments against one another, wherein the adjacently situated segments form collapsing connections in the obstacle.

[0025] The obstacle in the device according to the invention thus has two positions, an operative position, in which the segments are kept against one another, and for instance form a rail, and a collapsed position, in which the mutual connection of the segments has collapsed and the integrity or the shape of the obstacle has been ended. In this way the risk of injury is limited. When building up the holding means are activated again

[0026] Rebuilding the device is facilitated when the device is provided with serial means for keeping the segments in series after one or more of the collapsing connections have collapsed. As a result the segments remain in sequence and connected to each other.

[0027] In a simple embodiment the holding means also form the serial means.

[0028] The holding means are able to pull the adjacently situated segments against one another. This can be done in an easy way when the holding means comprise a tensioning element that can be activated and deactivated and extends permanently in serial direction, and which may also serve as said serial means. As a result the obstacle can be reconstructed without personnel having to place the segments against one another. By activating the tensioning element the segments can automatically form the obstacle again.

[0029] In that case the tensioning element may be shielded by the segments, in an embodiment in which the tensioning element extends through the segments. In that case the device itself can be provided with tensioning means for tensioning the tensioning element. In an embodiment the tensioning means are hand-driven, for instance by a handle. Personnel can be further economized on when the tensioning means comprise a drive, particularly a drive to be actuated by the device, particularly provided with a remote control.

[0030] In a further development the holding means are provided with trigger means for de-activating them when an event takes place, particularly an impact exerted on the obstacle by an intended user, preferably an impact exerted transverse to the obstacle. The impact may for instance be the legs of a horse that contact the obstacle.

The integrity of the obstacle can then immediately be substantially fully ended, as the force that holds the segments together is then suddenly ended, with hardly any delay at all.

[0031] In one embodiment the holding means comprise locking means that are deactivated, particularly immediately, on impact. Said locking means may comprise a blocking part, such as a blocking ball that indirectly engages onto said tensioning element. On impact the ball is pushed in and the tension on the tensioning element drops away so that the segments are able to move.

[0032] Collapsing of the obstacle is enhanced when at the location of the collapsing connection the segments are potentially rotatable with respect to each other.

[0033] Bringing the segments together again is facilitated when at the location of the collapsing connection the segments are provided with orienting means for mutually orienting both segments. When pulling the segments against one another they will come to lie in line with each other again as if of their own accord.

[0034] When the segments are formed like bodies of revolution with respect to a centre line that coincides with the centre line of the obstacle, they fit together in any rotated position, which enhances the joining together.

[0035] In a further development of the device according to the invention the obstacle extends sidewards from the support like a kind of outrigger.

[0036] Such a device can be joined with a comparable device for forming an obstacle device having two supports on either side, when the obstacles in question with their outer ends extend from opposite directions to near one another. The outer ends of both obstacles can for additional stability be provided with cooperating coupling means such as for instance magnets.

[0037] The device may particularly be designed as a jumping obstacle for animal sports, particularly equestrian sports.

[0038] According to a further development the device according to the invention is provided with setting means for adjusting the height of the obstacle, preferably by means of a drive that can be manually operated or can be controlled by motor, preferably can be remote controlled, so that the height of the obstacle can easily be adjusted to the needs.

[0039] From a further aspect the invention provides an obstacle device comprising a support to be placed on a basis and an obstacle to be supported by the support, wherein at least a part of the obstacle in the operative position is tensioned against the support by tensioning means, wherein the device is furthermore provided with releasing means to be activated or triggered for relaxing the tensioning means on impact by a foreign body against the obstacle member.

[0040] In that case the tensioning means can also form connection means for permanently connecting the obstacle member and the support to each other. The tensioning means can comprise a cable, rope and the like, wherein the tensioning means are adapted for tensioning the cable and the like and the releasing means are adapted for releasing a length, particularly a limited length, of the cable and the like. After relaxation of the tensioning means the obstacle member can move downwards freely under influence of gravity. The features mentioned in claims 2-14 may apply to this.

[0041] It is noted that, for instance from JP 08-309040, EP 0.042.810 and DE 93.01 135 U horizontal or upright rails and poles are known, which by means of a pretensioned, movable connection, comprising a cable and a spring, have been tensioned against a support. On impact the rail or pole gives way in a resilient manner, in order to immediately return to the initial position due to spring action.

[0042] From a further aspect the invention provides an obstacle device comprising a support and an obstacle to be supported by the support, wherein the obstacle comprises at least one obstacle member which with respect to the support can be moved between an operative position in which the obstacle has its integrity as an obstacle and a lower collapsed position in which the integrity of the obstacle is at least partially ended, wherein the device further comprises holding means for with a pulling force keeping the obstacle member in the operative position with respect to the support, wherein the holding means are adapted for on an impact exerted on the obstacle member by a user of the obstacle device, allowing, particularly immediately allowing, said obstacle member to move to the collapsed position.

[0043] The aspects and measures described in this description and the claims of the application and/or shown in the drawings of this application may where possible also be used individually. Said individual aspects may be the subject of divisional patent applications relating thereto. This particularly applies to the measures and aspects that are described per se in the sub claims.

SHORT DESCRIPTION OF THE DRAWINGS

[0044] The invention will be elucidated on the basis of an exemplary embodiment shown in the attached drawings, in which:

Figures 1A-C show a front view, top view and isometric view, respectively, of a exemplary embodiment of an obstacle according to the invention, intended for jumping sports, particularly equestrian sports;

Figures 2A and 2B show details in the obstacle of figures 1A-C;

Figure 2C shows an alternative for the detail of figure 2B;

Figures 3A-C show a cut-away side view and a cut-away isometric view, respectively, of a control unit of the obstacle of figures 1A-C and a detail thereof,

from one side;

Figures 3D and 3E show examples of a connection between rail and column for the obstacle of figures 1A-C;

Figures 4A-C show a side view and a front view and an isometric view, respectively, of the other side of the control unit of figures 3A-C;

Figures 5A-C show a front view, top view and isometric view, respectively, of the obstacle of figures 1A-C, after collapsing;

Figures 6A-C show a front view, top view and isometric view, respectively, of the obstacle of figures 1A-C, during its reconstruction; and

Figures 7A-C show a guide, a blocking pin and a cable tensioning arrangement provided therewith, respectively, as an alternative embodiment.

DETAILED DESCRIPTION OF THE DRAWINGS

[0045] The obstacle 1 of figures 1A-C comprises two columns 2 and two (but this can be any other number) rails 3 which at their ends are supported by the columns 2. The columns 2 are fixedly positioned on a basis and they are hollow. The rails 3 have been built up from elongated, hollow segments 4, which by means of a tensioning cable 20 (figures 2A and 2B) passed through them have been tensioned against each other in order to be in line with each other.

[0046] At the location of a centre plane M the rails 3 have been divided and therefore comprise two rail members 3a,b which are each connected with their own column 2.

[0047] As can be seen in the figures 2A and 2B, the segments 4 are composed of a straight circle-cylindrical casing 5, for instance of synthetic material, and define a cavity 6 which at the one end is closed off by a cap 7 and at the other end by a cap 8, which -for instance synthetic- caps 7,8 are attached to the casing 5 by means of a press fit. The caps 7,8 are provided with shoulders 10, 13 that abut the end edges 9, 12 of the casing 5. The shoulders 10, 13 furthermore have axially oriented end edges 11 and 14.

[0048] The cap 7 is provided with a concave end surface 15 of which the curvature is spherical having centre N1. The cap 7 is provided with a central hole 17 for tensioning cable 20. The cap 8 is provided with a convex end surface 16 of which the curvature is spherical having centre N2. The cap 8 is provided with a central hole 18 for tensioning cable 20, which hole is in line with hole 17.

[0049] When the tensioning cable 20 is tensioned the caps 7,8 fit snugly into each other, see figure 2A, wherein the end surfaces 15 and 16 are able to contact each other so that the centres N1 and N2 at least almost coincide. The end edges 11 and 14 of the caps 7 and 8 then sit tightly against each other in a tensioned manner. The connection shown in figure 2A is a potential collapsing connection that becomes active (collapses) when the tension on the cable 20 drops away.

[0050] In both end segments 4 of the rail members 3a, b the cable end 20a is secured to its cap 7, see figure 2B. The cable end 20a is attached to a spring 28 which itself is attached to eye bolt 26, which by means of nut 27 is secured to the end surface 15 of cap 7. Both end edges 14 are positioned at a small distance from each other, large enough to make rotation of the end segments 4 in the vertical plane possible.

[0051] An alternative for this meeting area is shown in figure 2C, wherein both caps 7 have been replaced by caps 8', which have internally been provided with a transverse bar 27' on which the spring 28 is attached. In both end walls, that are closed, permanent magnets 29 have been housed, which attract each other, such that the convex surfaces 16' are aligned with each other. Due to the convex spherical shape the surfaces 16' are able to approach each other closely without impeding a later rotation of both end segments in the vertical plane. The influence of the magnets 29 is limited in radial direction, in order not to impede the collapsing of the rail 3, described later.

[0052] An example of a tensioning mechanism that can be used in the invention is shown in figures 3A-3C.

[0053] The control unit 80 comprises a case 30, in which are arranged a drive, comprising an electromotor 32, a guide 33 and an extending rod 34, which can be reciprocally moved in vertical directions C by the motor 32. At the lower end of the extending rod 34 two transverse arms 35,36 are attached, wherein the transverse arm 36 extends in a vertical slit 38 in the case 30 and the transverse arm 35 is provided with an eye 37 though which in a fitting yet slidable manner a bending-stiff draw bar 40 extends. The draw bar 40 in a slidable manner extends through two plates 39a,b that are fixedly attached to the case 30. On the draw bar 40, below the eye 37, an adjusting nut 41 is attached, which can be set in position along the draw bar and forms an abutment.

[0054] The upper end of the draw bar 40 is attached to the end 24a of a cable 24, which runs around cable pulley 22 and is attached thereto with end 24b. The cable pulley 22 is rotatable about shaft 23. On the shaft 23 a second cable pulley 21 is bearing mounted, to which the ends 20b of both tensioning cables 20 have been attached. Each tensioning cable 20 runs in its individual groove about the cable pulley 21 and about its individual pulley 25, through a hole in the case 30 and in the cavities 6 of rail segments 4 of the rail 3a,b in question.

[0055] In figure 3C it is shown in detail that the cable pulley 21 is provided with a step-shaped recess 76, having a step wall 76 situated slightly to the right of the radial of the pulley 21. In the recess a spring-loaded ball 78 of a blocking device extends, which ball is held by housing 77 in which a compression spring is accommodated

which presses the ball 78 down with a set force, in the recess 76. The adjustment takes place by means of a blocking pin accommodated in the housing 77 by means of a screw connection, of which blocking pin the inner end presses against the spring and the outer end is provided with a hexagonal hole 79 for an Allenkey with which the pin can be screwed in or out with respect to the housing 77 to the desired extent. The ball 78 presses with such a (pre-set) force that the cable pulley is stopped against, as considered in the drawing, anti-clockwise rotation, in the normal position of use of the obstacle, that means when the obstacle is the ready position. In the condition shown the tensioning cable 20 is tensioned such that the rail segments 4 are in horizontal line with each other, wherein the ball 78 abuts the wall 76a, and the cable pulley 21 is locked against rotation in the direction B. It is noted that in figure 3A the extending rod 34 is depicted in an extended position in which the cable 24 has rotated the cable pulley 22 in the direction A as far as is desired in order to let the ball 78 engage behind the wall 76a of the cable pulley 21. After that the position of the pulleys 21 and 22 has been secured, and the extending rod 34 can be retracted again, upwards, by the electromotor 32, wherein the eye 37 slides over the draw bar 40.

[0056] In figure 3D a possible embodiment of the connection of the rail members 3a,b on the related control units 80 is shown, wherein use is made of a rail piece 4", which may substantially correspond with a cap 7, in this case cap 7". The cap 7" has an end edge 71 that is attached, for instance by means of glue, to side surface 70 of the case 30. The cap 7" has a hollow surface 15" in which spherical-convex surface 16' of a cap 8' of a rail segment 4' is fittingly and rotatably accommodated. The fit may be in accordance with what has been described in connection with figure 2A. The cap 7" thus forms a hollow hinge for the rest of the rail 3(b), with the possibility to rotate in the horizontal plane and the vertical plane. Around the collapsing connection thus formed a bellows-shaped sleeve 72 is arranged, which serves to keep dirt away from the surfaces 16' and 15". It is noted that such sleeves can also be provided between the ends of the segments 4, 4, with some adaptation of their shape.

[0057] In figure 3E an alternative for the connection of the rail members 3a,b on the related control unit 80 is shown, wherein via brackets 74 rail segment 4" is attached to the case 30, via a horizontal hinge pin 75. The orientation in the vertical plane of rail segment 4" can be adjusted by tilting about pin 75 (directions P) and be secured by placing pin 81 in the locking hole 82 related to that position. The position shown can for instance be used for forming a so-called cross-rail as jumping obstacle for horses.

[0058] At the outside of the case 30, see figures 3B and 4A-C, a large cable pulley 50 (figure 4C) is arranged, that is freely rotatable about a shaft 51 and about which a cable 52 runs, which with an end is attached to the cable pulley 50 and runs around roller 54a and with the other end is attached to a fixed point 53 at the upper end of the column 2 (not further shown). On the same shaft a small cable pulley 56 is furthermore bearing mounted, as one rotatable unit with pulley 50, to which the end of a cable 55 is attached that runs around roller 54b and with the other end 55a is attached to the lower end of an extending rod 64 of a drive 61 that further comprises a guide 63 and an electromotor 62.

[0059] In figures 4B and 4C it is further shown that the case 30 is provided with rods 66a,b on which the rollers 54a,b are bearing mounted and which at the ends have been provided with wheels 67a,b that are guided in schematically shown channels in the column 2.

[0060] By operating the electromotor 62, using remote control, the extending rod 64 can be retracted, direction J. As a result the pulley 56 will rotate in direction K, and so will the pulley 50, as a result of which the cable 52 will be pulled in direction L. As a result the case 30 will move upwards in the direction N, guided in the column 2 by wheels 67a,b. In that way the rails 3 that are held by the cases 30 are set higher, at the desired height. In case of lowering the electromotor 62 can be operated in opposite direction.

[0061] The condition shown in figures 1A-C is the operative position of the obstacle 1. It may occur that during a jump a horse contacts one of the rails 3 or both rails 3 with its legs. It may also occur that a horse does not jump and contacts both rails 3 with its chest. In that case the rails 3 will be subjected to a transverse force F and tend to deflect from the horizontal direction. As a result an additional pulling force is exerted in a sudden, dynamic way on the tensioning cable 20 (or on both tensioning cables 20), as a result of which the force that the cable pulley 21 exerts with the step wall 76a on the ball 78 exceeds a threshold value so that the step wall 76a pushes the ball 78 upwards and the cable pulley 21 suddenly, as it were triggered by the impact, is released and able to rotate anti-clockwise, direction B. In that case the initial locking means form releasing means, in the sense that the spring allows the ball to move so far that the locking is ended. The tensioning cable 20 is as a result automatically, immediately relaxed. The cable pulley 22 rotates along and the draw bar 40 rockets upwards, guided by the plates 39a,b. Due to the tension dropping away in the tensioning cables 20 (direction E) the integrity of the rails 3 is ended to an important degree. As a result thereof the collapsing connections between the segments 4 are used and the rail segments 4 are able to tilt with respect to each other under the influence of gravity and optionally the impact, and optionally slide apart. The rails 3 then as it were collapse, direction G, and end up in a position shown in figures 5A-C. Thus the obstacle body, in this case the rails 3, drop away near the location of contact. The rails 3 do not fully collapse as the cable 20 still extends through them and a residual tension is maintained in the cable 20, as can be seen in figures 5A-C. The draw bar 40 in the end namely touches the lower side of the plate 39a with the stop nut 41, as a result of which relax-

ation of the cable 20 is stopped and a limited length of the cable, corresponding with the distance between the plates 39a and 39b minus the thickness of the stop nut 41, is released.

[0062] As the tensioning cable 20 still extends through the segments 4, said segments remain in series with each other, in the sense of a chain of beads connected to each other. This is advantageous in re-erecting the obstacle.

[0063] For reconstructing the obstacle 1 the remote control for the electromotor 32 is operated, as a result of which the extending rod 34 is extended downwards, wherein by contact of the adjusting nut 41 with the eye 37 the draw bar 40 is urged downwards in direction D and the cable 24 rotates the cable pulleys 21 and 22 in the direction A. As a result the tensioning cables 20 are tightened in directions H and the tension in the tensioning cables 20 is restored, wherein finally the ball 78 engages behind the step wall 76a again and the position of figures 1A-C is restored.

[0064] In case of disintegrating and reassembling the rails 3 the convex-concave interlocking of the ends of the rail segments 4 facilitates the mutual movement. The end edges 11 and 14 enhance the aligning at reassembly, just like the cable 20 that extends through the holes 17 and 18.

[0065] With the self-restoring obstacle according to the invention, the obstacle, after the rail(s) has(have) dropped, can be brought back into its initial position without physical effort. Reconstruction of the obstacle takes place by means of tensioning the rail by means of a tensioning mechanism. The tensioning mechanism can be any medium with which tensioning takes place. For instance a cable, rope, pneumatics, hydraulics, magnet, etc. or a combination of the various elements. Tensioning this mechanism can also take place in various ways, such as a motor, pneumatics, hydraulics, or a spring.

[0066] The rails 3a,b can alternatively be integrally formed, wherein by means of their own tensioning cable they are tensioned to the column 2, in the manner described above or in any other suitable way.

[0067] Tensioning the rail can also take place on one side, in which case the rail in question forms an outrigger from one column.

[0068] Reconstructing an obstacle according to the invention can be carried out in various ways, for instance:

- A certain time after the rail was thrown (time switch).
- After the horse rider has activated the reconstruction (remote control).
- After checking the obstacle itself whether there is no obstruction (horse or man) between the poles.

[0069] In an obstacle according to the invention a collapsible rail can be combined with a standard rail. In the example given the lower rail could for instance be designed as standard rail.

[0070] The tensioning mechanism for the cable can be designed in various ways. For instance, see figures 7A-C, the cable 120 can be tensioned by means of a tensioning arm 122, that is rotatably attached about hinge 122a in a case 130 and provided with a pulley 126 for the cable 120, of which the end 120b is fixedly attached in the case. While tensioning the cable 120, the tensioning arm 122 can be rotated into a tensioning position, shown in figure 7C, by a remote controlled flight 134 accommodated in the case 130 and moved by a remote controlled actuator 132 and provided with a hook 137 that engages onto a protrusion on the arm 122. For locking, the tensioning arm 122 is provided with a V-slot 176a oriented transverse to the rotary path of the tensioning arm, in which slot, in the tensioning position, a blocking pin 178 of the blocking unit 177 (figure 7B), which pin is spring-biased to the tensioning arm, can be pressed by a cup spring package 194, provided with a hexagon 179 for adjusting the force with which the pin 178 can be pressed to the inside. The tensioning arm 122 is guided within guide 190 of figure 7A. The guide 190 is designed double and comprises two plates 191a,b which with a separation plate 192 situated in between them define two vertical passages 193a,b. For each of the passages 193a,b a blocking unit 177 is positioned, in order to engage into the V-slot 176a of a tensioning arm 122 fittingly accommodated in the passage 193a,b. For both cables 120 an individual tensioning arm 120 may namely be provided. The tensioning arm or tensioning arms 122 is or are guided by the guide 190 at rotation about hinge 122a. After making the tensioning device shown ready, when the pins of both tensioning arms 122 have snapped into the V-slots 176a, the flight 134 can be moved upwards again by the actuator 132 to an initial position, outside the intended path of the tensioning arm, in particular the protrusion, when said arm is released. At on impact exceeding the holding force of the blocking pin 178 in the V-slot 176a the tensioning arm 122 is immediately released and is pulled along by the cable 120, until the tensioning arm ends up against a stop 196 that is provided with a damper. As for each tensioning arm an individual blocking ball or the like is provided, only the rail touched will collapse on impact. For restoring the tensioned condition the flight 134 is operated again. A flight 134 can be provided for each tensioning arm 122.

[0071] As discussed the rails can be set at different heights so that this obstacle is suitable for any height to jump. Also this mechanism can be designed in various ways, electrically, pneumatically, hydraulically or in any other way in order to come to a drive. Manual operation is also possible.

[0072] It is noted that the invention can also be used in other sports besides the equestrian jumping sports, for instance in track and field events, such as the hurdle race and high jumping, basically in any condition in which a rail can be thrown off that subsequently has to be restored in position.

[0073] The above description is included to illustrate the operation of preferred embodiments of the invention and not to limit the scope of the invention. Starting from

the above explanation many variations that fall within the spirit and scope of the present invention will be evident to an expert.

Claims

1. Obstacle device, particularly designed as jumping obstacle for animal sports, particularly equestrian sports, comprising a support and an obstacle, particularly elongated obstacle, to be supported by the support, wherein the obstacle comprises at least one obstacle member which with respect to the support can be moved between an operative position in which the obstacle has its integrity as an obstacle and a lower collapsed position in which the integrity of the obstacle is at least partially ended, wherein the device furthermore comprises holding means for pulling, particularly tensioning, the obstacle member to the support in order to hold it in the operative position, wherein the holding means also comprise releasing means for on an impact exerted on the obstacle member by a user of the obstacle device, lowering, particularly ending, the pulling force, in order to allow, particularly immediately allow, said obstacle member to move to the collapsed position.

2. Device according to claim 1, wherein the releasing means are designed for on impact immediately ending the pulling force.

3. Device according to any one of the preceding claims, wherein the holding means form a permanent connection for the obstacle member with adjacent parts of the device, particularly the support.

4. Device according to claim 1, 2 or 3, wherein the holding means comprise at least one tensioning element, such as a cable, rope or the like -extending particularly through the obstacle- for in the operative position tensioning the obstacle member to the support, wherein the device preferably comprises tensioning means for tensioning the tensioning element, and the releasing means are adapted for releasing a length, particularly a limited length, of the cable and the like, wherein the tensioning means preferably comprise a drive, particularly a drive to be actuated by the device, and particularly provided with a remote control.

5. Device according to claim 4, wherein the holding means comprise locking means, which preferably have been spring loaded or pre-tensioned, for securing the tensioning means in a tensioned condition, wherein the releasing means are configured for ending the locking when the pulling force is exceeded to a predetermined degree, wherein the releasing means preferably are adjustable for adjusting the predetermined degree of exceeding the pulling force with which the locking is ended.

6. Device according to claim 5, wherein the locking means comprise a blocking part, such as a blocking ball or blocking pin, which directly or indirectly engages onto the tensioning element and on impact is operated to end the locking.

7. Device according to any one of the preceding claims, wherein the holding means, particularly the locking means and the releasing means, are designed for on an impact oriented transverse to the pulling force on the obstacle member releasing said obstacle member in order to let it assume the collapsed position.

8. Device according to any one of the preceding claims, wherein in the operative position the obstacle member is connected to an adjacent part of the device by means of a collapsing connection, wherein, preferably, the collapsing connection forms a potential rotary connection, wherein, preferably, the obstacle member and the adjacent part of the device are provided with first cooperating orienting means for mutually orienting in the operative position and/or wherein the device is provided with second orienting means for with respect to the support adjusting the orientation of the obstacle member.

9. Device according to any one of the preceding claims, wherein the obstacle member is substantially elongated and the pulling force is substantially in line therewith, particularly generates a normal force in the obstacle member.

10. Device according to any one of the preceding claims, wherein the obstacle comprises a number of obstacle members pulled against one another in series by the holding means.

11. Device according to any one of the preceding claims, comprising two obstacles that are not in line with each other and having one obstacle member each, wherein both obstacle members have each been pulled against a common support by holding means, and the locking means and releasing means are jointly active on the holding means of both obstacle members, wherein preferably the tensioning means are substantially common, as well as the operation device for them.

12. Device according to any one of the preceding claims, wherein the obstacle extends sidewards from the support.

13. Assembly of two devices according to claim 12, wherein the obstacles in question of opposite direc-

tions extend with their outer ends to near one another, wherein, preferably, the outer ends of both obstacles are provided with mutually cooperating coupling means.

14. Device according to any one of the preceding claims, provided with setting means, for adjusting the height of the obstacle, wherein, preferably, the setting means comprise a drive, particularly with a remote control.

15. Obstacle device comprising a support to be placed on a basis and an obstacle to be supported by the support, wherein at least a part of the obstacle is tensioned in an operative position against the support by tensioning means, wherein the device is furthermore provided with releasing means for relaxing the tensioning means, which releasing means are to be activated on impact of a foreign body against the obstacle member, wherein the tensioning means preferably also form connection means for permanently connecting the obstacle member and the support to each other, wherein the tensioning means preferably comprise a cable, rope and the like, wherein the tensioning means are adapted for tensioning the cable and the like, and the releasing means are adapted for releasing a length, particularly a limited length, of the cable and the like.

16. Obstacle device comprising a support and an obstacle to be supported by the support, wherein the obstacle comprises a number of segments positioned adjacent and against each other, wherein the device furthermore comprises holding means that can be activated and de-activated for keeping the adjacently situated segments against each other with a holding force, wherein the adjacently situated segments form collapsing connections in the obstacle.

17. Device according to claim 16, provided with serial means for keeping the segments in series after one or more of the collapsing connections has collapsed.

18. Device according to claim 17, wherein the holding means also form the serial means.

19. Device according to claim 16, 17 or 18, wherein the holding means pull the adjacently situated segments against one another.

20. Device according to claim 19, wherein the holding means comprise a tensioning element that permanently extends in serial direction.

21. Device according to claim 20, wherein the tensioning element extends through the segments.

22. Device according to claim 20 or 21, provided with tensioning means for bringing the tensioning means at tension.

23. Device according to claim 22, wherein the tensioning means comprise a drive, particularly a drive to be actuated by the device, particularly provided with a remote control.

24. Device according to any one of the claims 16-23, wherein the holding means are provided with trigger means for de-activating the holding means in case of an event, particularly an impact exerted by the user on the obstacle, preferably an impact exerted transverse to the obstacle.

25. Device according to claim 24, wherein the holding means comprise locking means that are de-activated on impact, particularly immediately.

26. Device according to any one of the claims 16-25, wherein at the location of the collapsing connection the segments are potentially rotatable with respect to each other.

27. Device according to any one of the claims 16-26, wherein at the location of the collapsing connection the segments are provided with orienting means for mutually orienting both segments.

28. Device according to any one of the claims 16-27, wherein the segments are formed like bodies of revolution with respect to a centre line that coincides with a centre line of the obstacle.

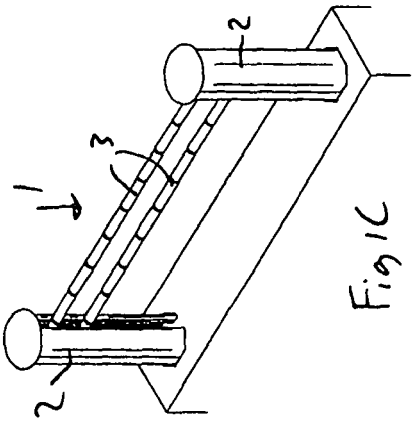


Fig 1C

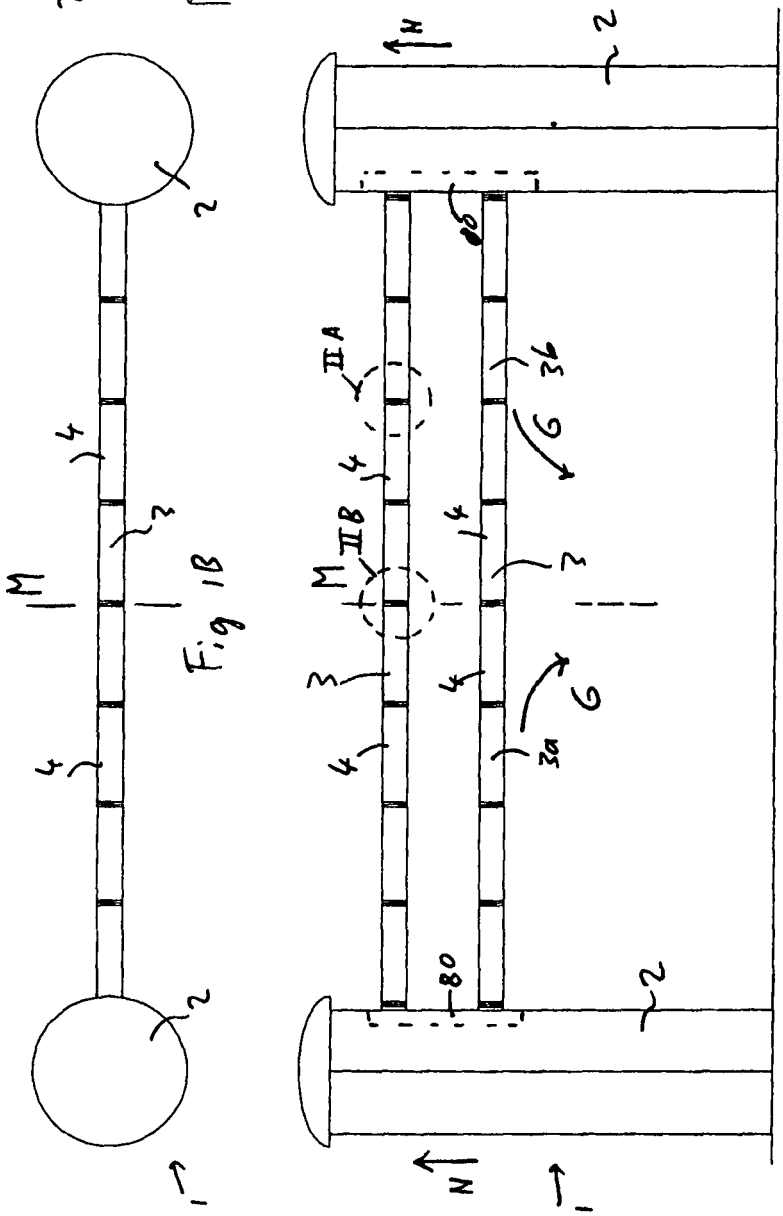
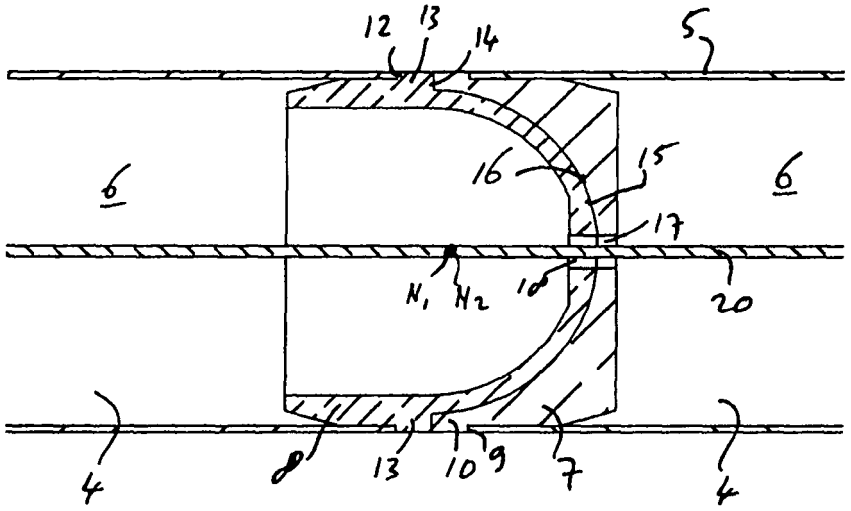


Fig 1A

Fig 1B


12
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16
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N2
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8
13
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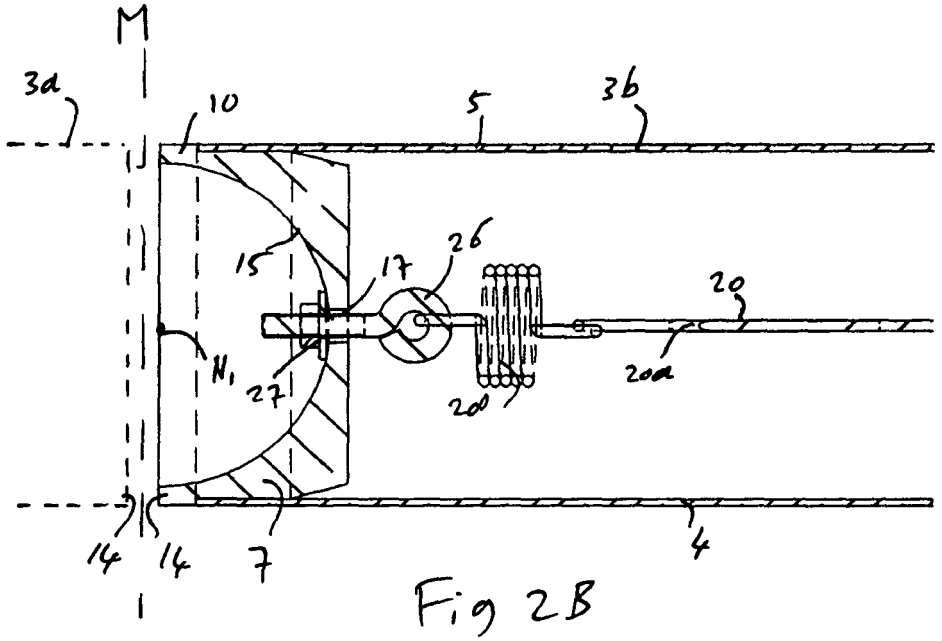
9
7
4

Fig 2A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N1
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14
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4

Fig 2B

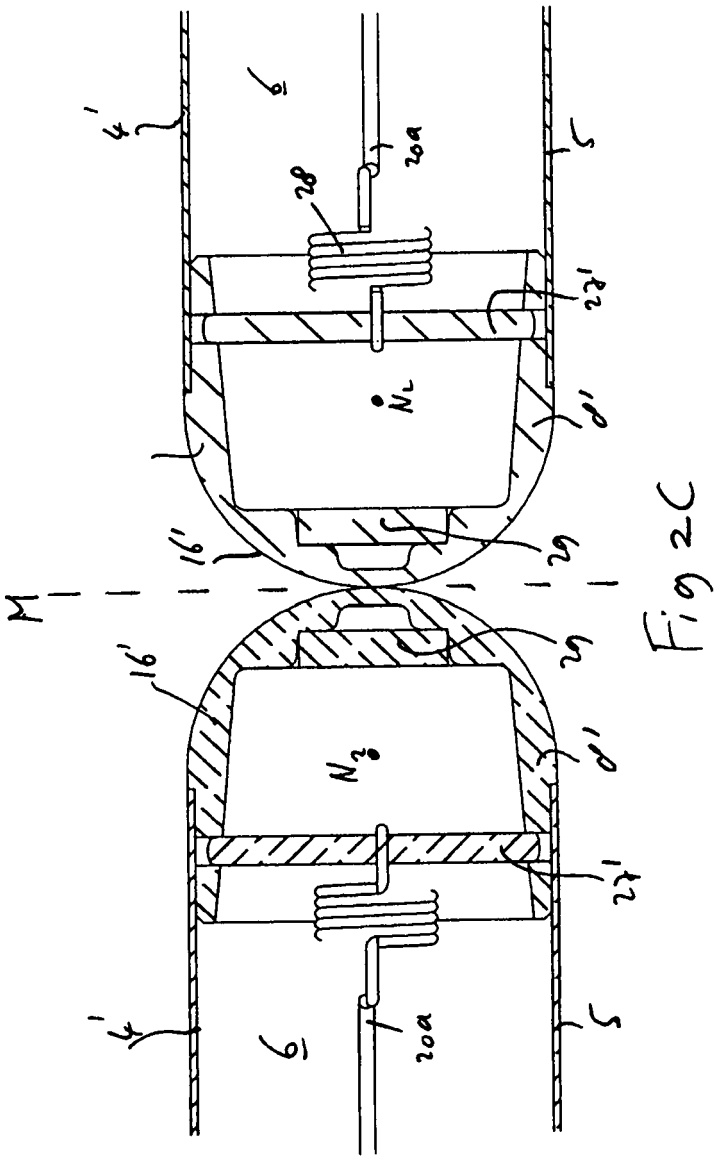


Fig 2C

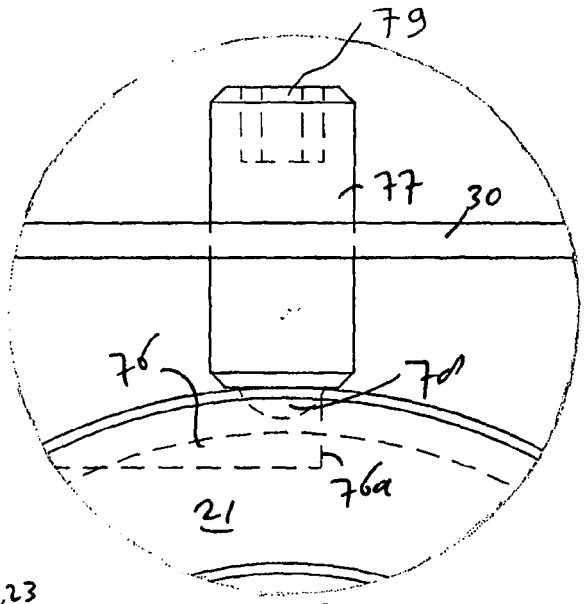


Fig 3C

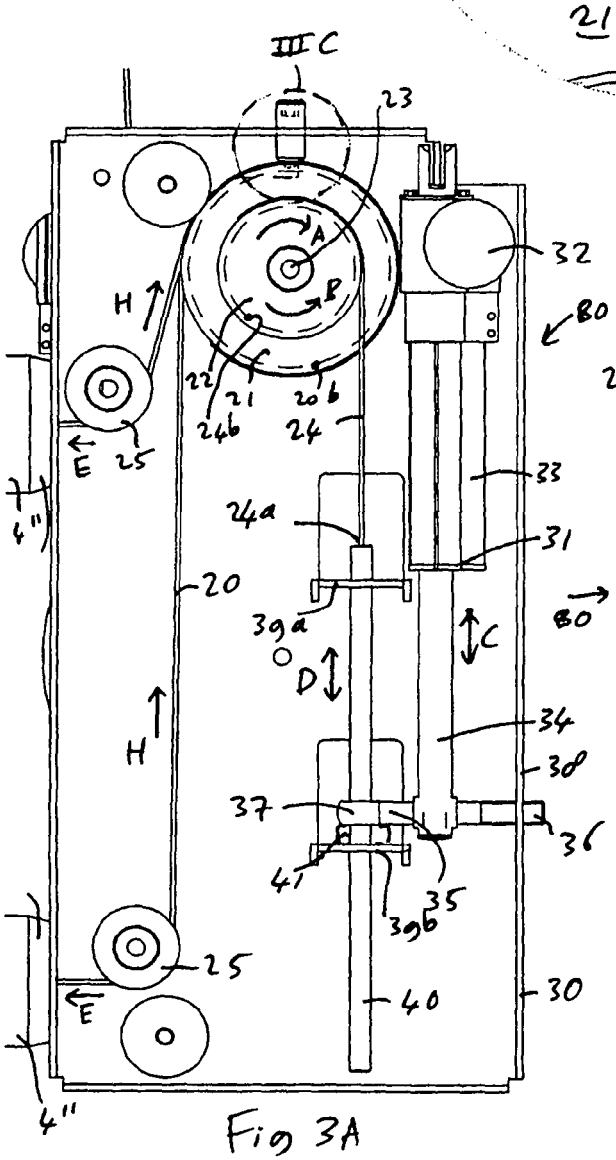


Fig 3A

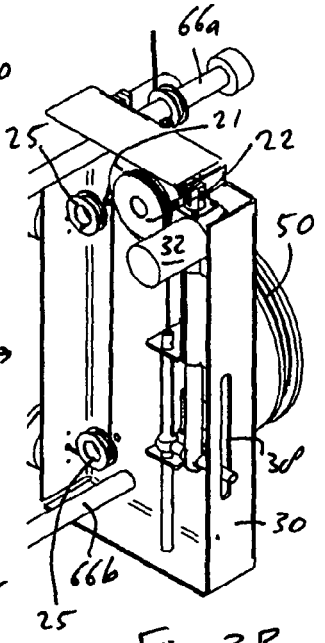


Fig 3B

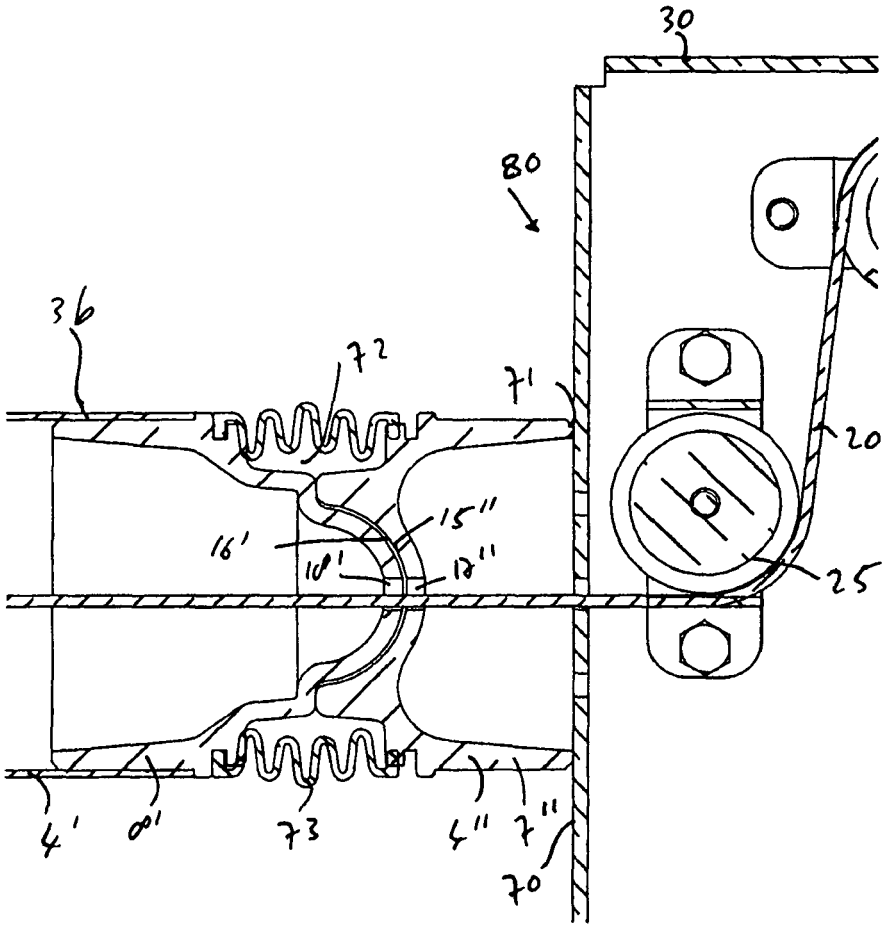


Fig 3D

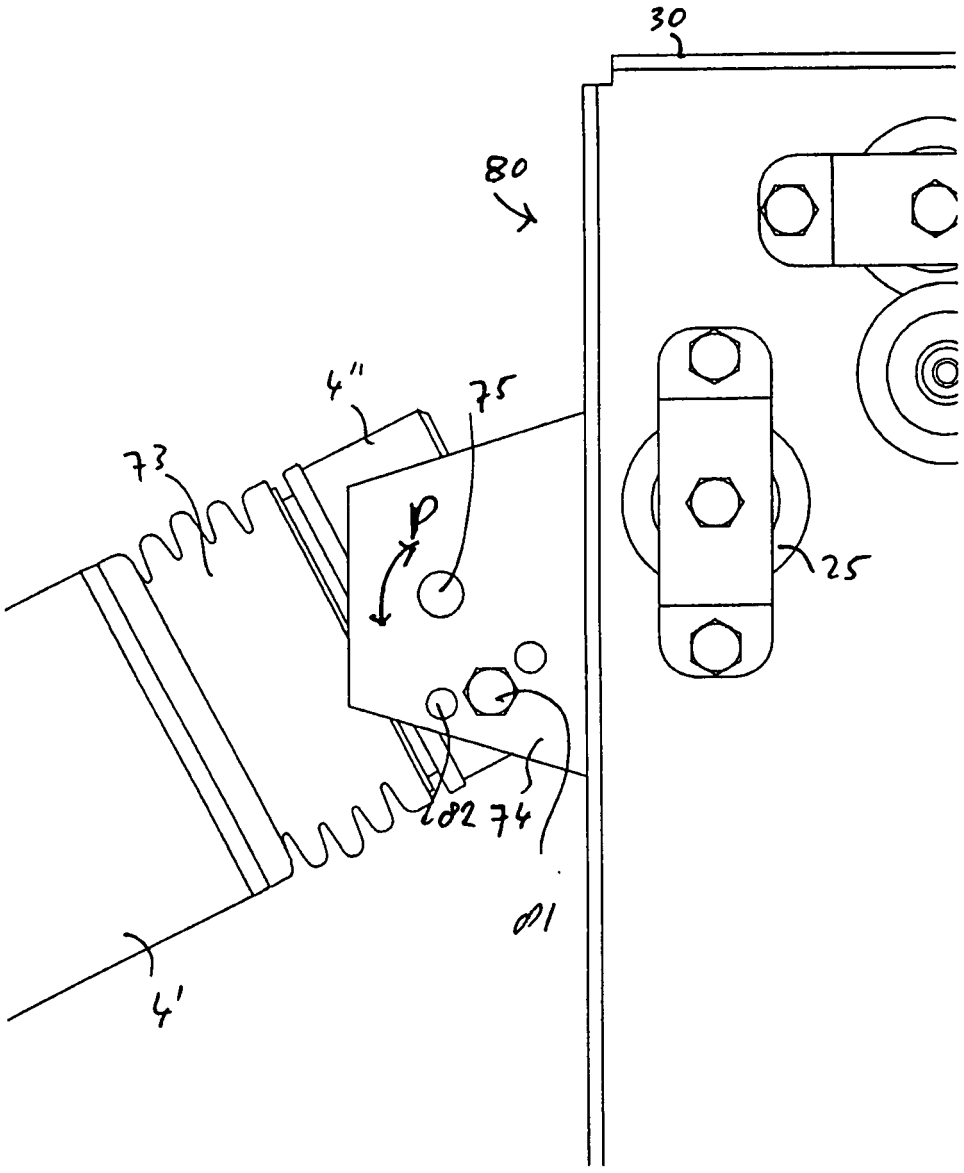


Fig 3E

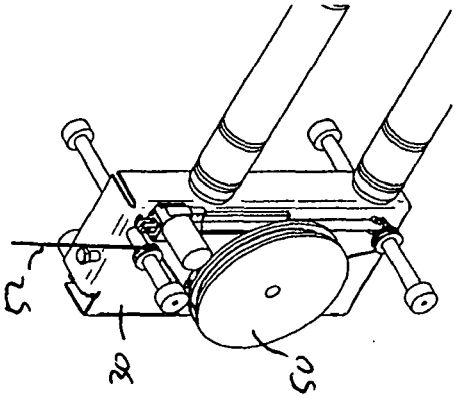


Fig 4C

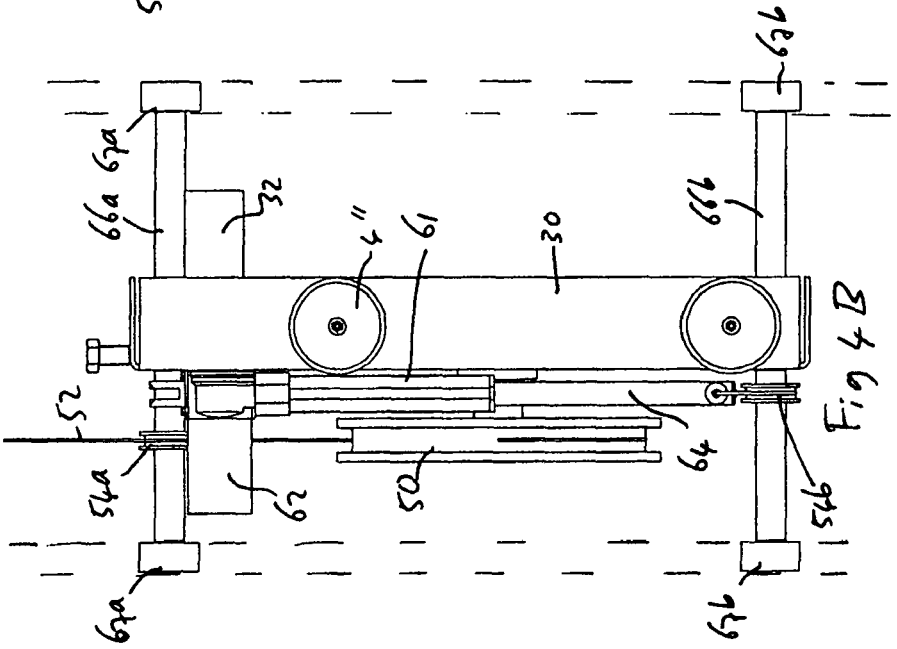


Fig 4B

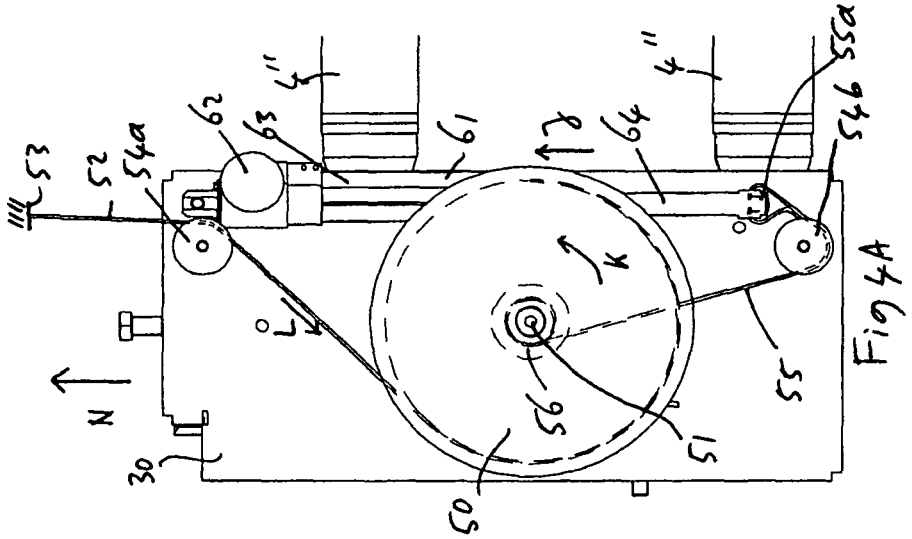


Fig 4A

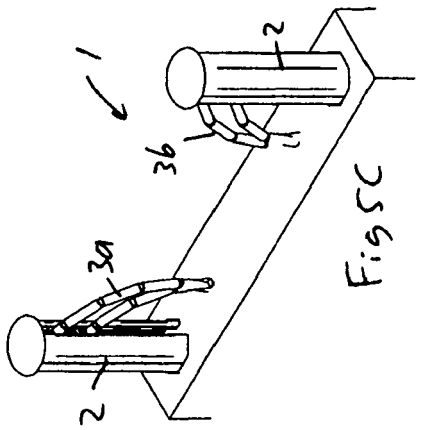


Fig 5C

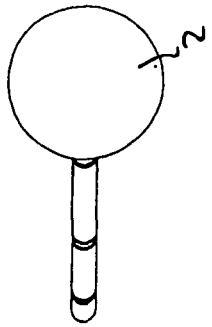
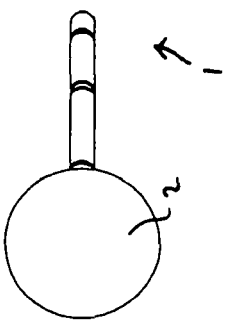


Fig 5B



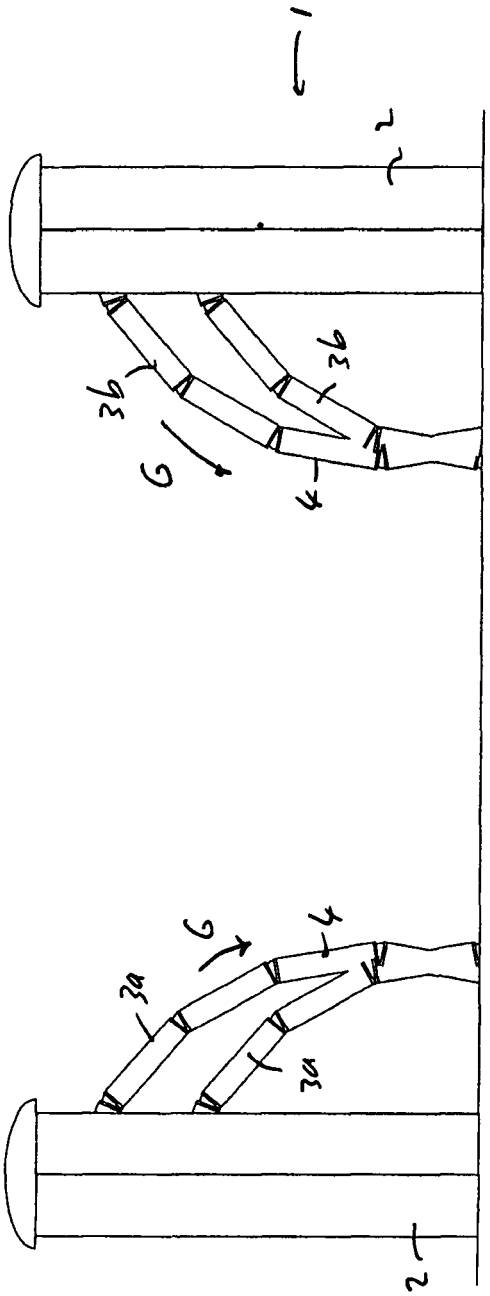


Fig 5A

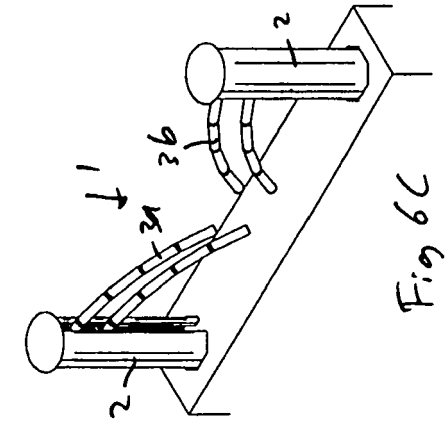


Fig 6C

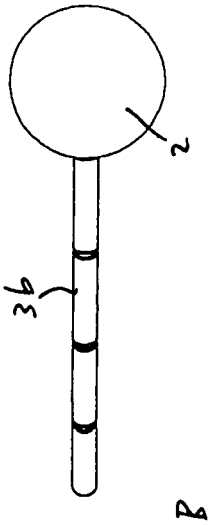
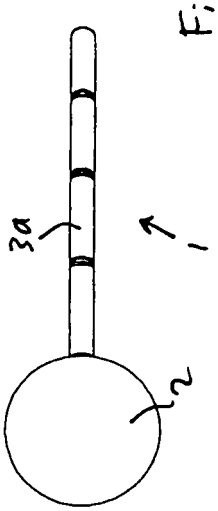
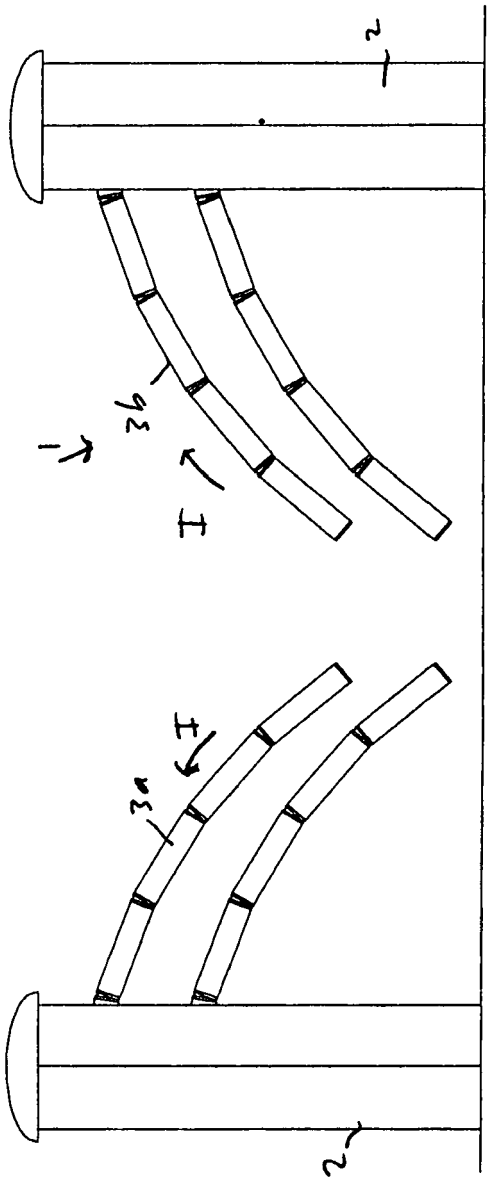


Fig 6B





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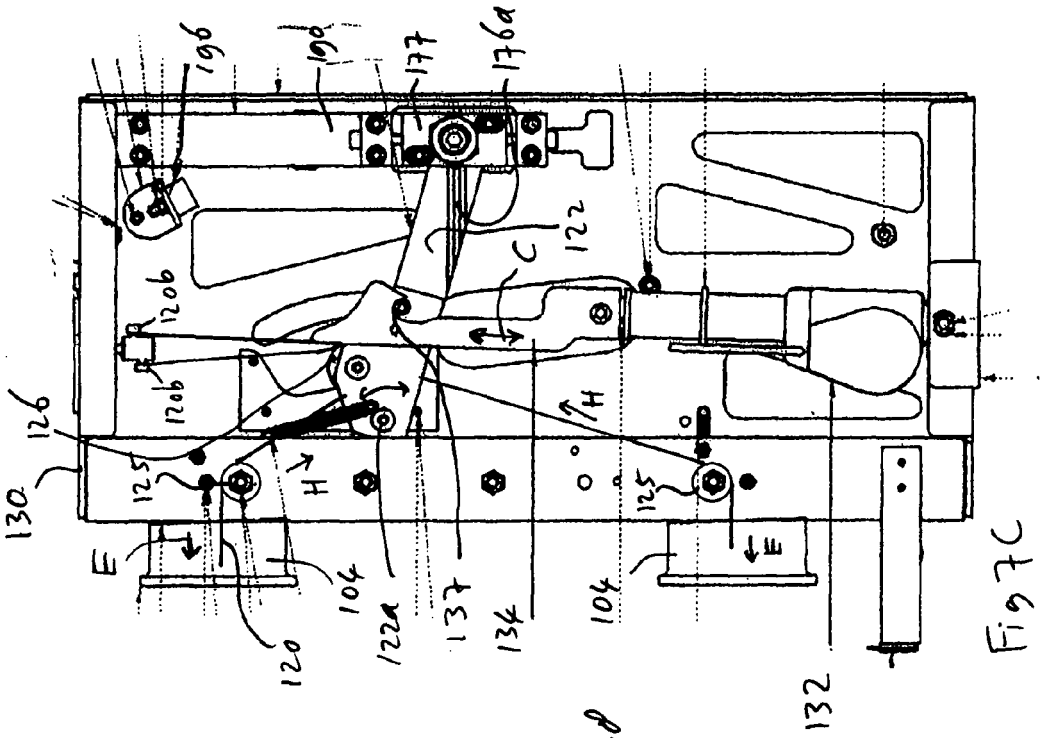

Fig 7C

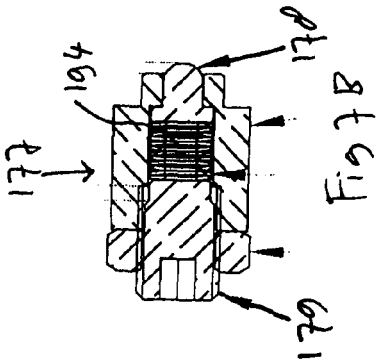

Fig 7B

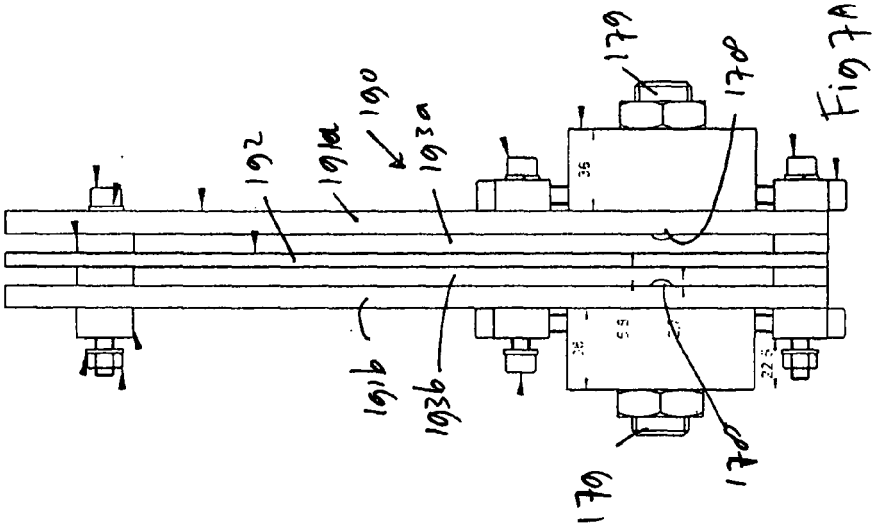

Fig 7A

REFERENCES CITED IN THE DESCRIPTION

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- JP 8309040 A **[0041]**
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- DE 9301135 U **[0041]**