Abstract Title: Vaginal muscle exerciser and sex toy

A vaginal muscle exerciser with an inflatable tube (10), an air pump (24) and a pressure gauge (40), where the pressure gauge can be an audible pressure gauge for audible indication of the vaginal muscle contraction. The audible indication can be either different voice messages or tunes to be played at different predetermined pressure levels. A vibrator can be integrated into the exercise tube for sexual stimulation, and additional tubes (200, 300) can be integrated for clitoral or anal stimulation.

Figure 1
Sex Toy

Field of the Invention

This invention relates to feminine muscle exercise devices, particularly vaginal muscle exercise devices, and arrangements and adaptations for use thereof as sex toys. Preferred embodiments of the invention are suitable for anal use by males or females.

Background to the Invention

US patent number 3,752,150 describes an exercising apparatus for exercising the vaginal musculature. It has an elongate resilient core member surrounded by an oversize flexible covering sealed to the core. A tubing attached to the core and extending from the covering provides a supply of pressurised liquid (water). A tube is provided for injecting the water from a syringe, and another tube is provided for allowing air to escape while water is being injected. The entire arrangement is cumbersome and is unsatisfactory both in set-up and in use.

Russian patent number RU 2012321 describes a pneumatic trainer for development of vaginal muscles. It comprises an elastic bladder placed on a catheter, with a pressure gauge to measure pressure, and a source of pressure. It is intended that, with a preliminary inflating, the cylindrical form and elastic bladder have the required resilience. In practice, the arrangement is crude and uncomfortable. It is little more than a child’s balloon with a central plastic tube.

For both of these prior arrangements, the relative comfort or discomfort will depend in large part of the size of the vagina and, moreover, the degree of success that can be achieved in improving vaginal muscle action is subject to
how well the simple arrangement fits the user. In particular, if the user's vagina is longer than the member to be inserted into the vagina, then not all of the muscles along the length of the vagina can be exercised at once – indeed, it may not be possible to exercise the deepest vaginal muscles at all. If the user's vagina is shorter than the inserted member, then there is a risk of injury or discomfort to the user (for example, if the end of the member is forced against the user's cervix).

There is a need for an improved vaginal muscle exerciser that is comfortable, pleasant and fun to use.

Summary of the Invention

In accordance with a first aspect of the invention, a vaginal muscle exercise device is provided comprising an inflatable vaginal muscle exercise tube, an air pump, and an audible pressure gauge connected to the exercise tube, providing an audible indication of pressure (absolute or relative) in the tube.

Storage means may be provided for storing pre-recorded voice messages, wherein the pressure gauge is arranged to annunciate a selected message dependent on the pressure. Alternatively or in addition, the storage means may store one or more pre-recorded tunes, wherein the pressure gauge is arranged to play a selected tune dependent on the pressure.

In accordance with a second aspect of the invention, a vaginal muscle exercise device is provided comprising an inflatable vaginal muscle exercise tube, an air pump and pressure gauge connected to the exercise tube, and at least one vibrator adapted for use in association with the exercise tube.
The vibrator may be integrally formed with the exercise tube, positioned for clitoral stimulation. A vibrator may be provided integrally formed with the exercise tube, positioned and adapted for anal stimulation.

A unitary housing may be provided for housing the air pump and pressure gauge, the housing having a battery compartment for holding a battery, and wires for supplying electricity from the battery to the or each vibrator.

Brief Description of the Drawings

Fig. 1 shows a vaginal muscle exercise device and apparatus in accordance with a preferred embodiment of the invention.

Fig. 2 illustrates an alterative arrangement of apparatus.

Fig. 3 shows apparatus similar to that of Fig. 2, with a first vibrating stimulator.

Fig. 4 shows apparatus similar to that of Fig. 3, with an additional second vibrating stimulator.

Detailed Description of the Preferred Embodiments

Referring to Fig. 1, a vaginal muscle exercise device is shown comprising a vaginal exercise tube 10 formed of a central tube 11 surrounded by an inner layer 12 formed of a relatively soft resin 12. The inner layer is in turn surrounded by an outer layer 13 of silicone, latex, rubber or similar elastomeric material. It will be appreciated that the inner layer 12 and outer layer 13 may comprise any other suitable elastically deformable materials. The central tube 11 is formed from an elastomeric material or a polymeric material and should be sufficiently rigid to support the exercise tube 10 upon
insertion into the vagina and to maintain the shape of its bore to a sufficient extent to allow the passage of air. Preferably, the central tube 11 is sufficiently soft and flexible to reduce the possibility of damage to vagina upon its insertion. The materials that comprise the inner layer 12 and the outer layer 13 are chosen such that they are sufficiently strong, resilient and durable to maintain their shape and integrity over several cycles of inflation and deflation, and to withstand the pressures experienced during use (which may be up to 300 millimetres of mercury (mm Hg), or even more).

The central tube 11 may be formed of polymeric material such as polyurethane or polypropylene that can bend under firm finger pressure and can be squashed a small amount under firm finger pressure. The resin or resinous material of the inner layer 12 is softer and easily pliable under finger pressure. Instead of resin, soft plastics material can be used. It is preferably about 2 mm to about 10 mm thick. The outer layer 13 is thin relative to the inner layer 12. The outer layer 13 has a thickness of about 0.2 mm to 0.6 mm, somewhat like an uninflated child's balloon. The inner layer 12 and outer layer 13 are airtight and are sealed in an airtight manner to the proximal end of the central tube 11 at region 9. The inner layer 12 and outer layer 13 are most preferably both sealed to the surface of central tube 11 in order that each seal is not be subjected to much movement. In a less-preferred embodiment the outer layer 13 is sealed to the outer surface of the inner layer 12. Sealing can be achieved by a suitable adhesive, by a heat-sealing process, or by any other suitable means known to those skilled in the art.

Providing a plurality of layers in this manner provides a safer arrangement, whereby one layer can maintain the overall shape of the exercise tube 10 if the other layer were to burst whilst in use. This can reduce the possibility of damage to the vagina. Sealing the layers prevents air escaping in the event that a layer bursts. Sealing the layers also reduces relative movement between the layers, which can facilitate insertion and removal of the exercise tube
to/from the vagina. This arrangement can also allow different materials – with different physical properties – to be used for the inner and outer layers. The inner layer 12 can be formed from a material that is relatively strong (and thereby able to withstand significant air pressure) but which may have an undesirable surface texture or visual appearance. The outer layer 13 can be formed from a material with lesser strength, but which has a more pleasing surface texture or appearance.

Forming the inner layer 12 with a greater thickness than the outer layer 13 can allow the inner layer to be strong, whilst allowing the outer layer to be supple and thin. For example, the inner layer 12 may comprise a layer of soft resin to provide adequate strength under pressure, whilst the outer layer 13 may comprise a silicone material to provide a pleasing tactile sensation. Whilst it is preferable to place condom over the exercise tube 10 before use, not all users will do so in practice; in such cases, it is advantageous for the outer layer 13 to have a pleasing tactile sensation. The outer layer 13 may be formed from a material that is resistant to bodily fluids and lubricants to provide durability, but it is not necessary for the material of the inner layer 12 to have such properties. In use, a condom can be placed over the entire exercise tube in the interests of hygiene.

In some examples, the exercise tube does not comprise an outer layer 13, such that the tube contains only one layer. In other examples, the tube comprises one or more intermediate layers disposed between the inner layer 12 and the outer layer 13. The outer, inner and intermediate layers are preferably each sealed directly to the central tube 11 at region 9. In less-preferred examples, the inner layer is sealed to the central tube, the intermediate layer(s) are sealed to the outer surface of the adjacent inner or intermediate layer, and the outer layer is sealed to the outer surface of the (outermost) intermediate layer. The intermediate layers can provide further safeguards in the event that the inner or outer layers burst during use.
At a proximal end 14 of the central tube 11 there is an air tube 15 and an optional connector 16. At or towards the distal end 17 of the central tube 11 there is an air hole 18. The air hole is in the side of the central tube to permit air to inflate and deflate the inner layer 12. The distal end 17 of the central tube 11 also has a hole. More holes may be provided along the length of the tube 11.

To the right of the connector 16 (as shown) is an elongate plastic tube 20 leading to a three-way ("T" or "Y") connector 21. To a first branch of the connector 21 is connected a second elongate plastic tube 22. This is connected to an air pump 24 having a button valve 25. To a second branch of the connector 21 is connected a third elongate plastic tube 30. This in turn is connected to a further three-way connector 31. To this connector there are connected fourth and fifth elongate plastic tubes 32 and 33 respectively. The fourth plastic tube 32 is connected to a pressure gauge 40. The fifth plastic tube is connected to manual adjuster 41 (which is similar to the air pump 24, but does not have any valve). Each of air pump 24 and manual adjuster 41 comprises a thick rubber bulb. The former is of a type commonly used for measuring blood pressure. It may have an air hole 26 that can be covered with the user's thumb during pressurization. The manual adjuster 41 has no air hole. The air pump 24 is intended to provide coarse control of the air pressure in the exercise tube 10, whilst the manual adjuster 41 allows for fine adjustment of the air pressure in the exercise tube by allowing relatively small increments or decrements in pressure to be made.

In operation, the exercise tube 10 is inserted into the vagina, and a small amount of air pressure is introduced using the air pump 24. The valve 25 permits air to pass from the pump 24 into the tube 22 without permitting the air to return. The introduction of air into the inner layer 12 causes the inner layer to inflate and to expand. Expansion of the inner layer 12 causes it to
push against the outer layer 13. Continued inflation (and the resultant expansion) of the inner layer 12 causes the outer layer 13 to expand. In this manner, both the inner and outer layers expand away from the central tube 11, thereby causing the external diameter of the exercise tube 10 to increase.

The exercise tube is preferably arranged such that its length does not contract upon expansion, in order that the exercise tube 10 allows muscles along the whole length of the vagina to be exercised regardless of the degree to which the exercise tube is inflated. For example, the inner layer 12 and/or the outer layer 13 may be formed with appropriate reinforcement to ensure that the outwards expansion that occurs upon inflation is not accompanied by a lengthwise contraction. In another example, the central tube 11 biases against the inner surface of the inner layer 12 to prevent lengthwise contraction.

In this way, the pressure, as measured by pressure gauge 40, is increased to a comfortable level. This inflation causes the external diameter of the exercise tube 10 to increase and, when a sufficient increase in diameter is achieved, a force is exerted upon the internal walls of the vagina and the vaginal muscles. More air can be pumped into the exercise tube in order to increase its diameter and thereby increase the force exerted upon the vagina.

It will be appreciated that the pressure required to inflate the exercise tube 10 to a particular external diameter will depend upon a number of factors, including the magnitude of the elastic forces in the inner layer 12 and outer layer 13 (which will oppose the expanding force of the air pressure, and will be dependent upon the materials, thickness and structure of the layers 12, 13) and the force exerted upon the exercise tube by the vagina. All pressure values specified herein are purely illustrative, since the actual pressures involved will be dependent upon the construction and configuration of each particular exercise tube 10.
The user squeezes the vaginal muscles, thereby increasing the pressure in the exercise tube 10 and the tubes 20, 30 and 32. The increase in pressure can be seen on the gauge 40, and a large increase in pressure is indicative of strong muscular contraction. The magnitude of the pressure increase will depend upon the overall volume of air within the exercise device (since, according to Boyle's Law, the product of pressure and volume will remain constant as the user's vagina compresses and releases the exercise tube). All pressure values specified herein are purely illustrative, since the actual pressures involved will be dependent upon the configuration and construction of each particular exercise device. The user can manually adjust the level of pressure using adjuster 41.

On completion of an exercise routine, the user can release the pressure in the device by pressure release button on the valve 25. The exercise tube 10 deflates and can be removed from the vagina.

Different users have different lengths of vagina. A user with a short vagina may find a device in accordance with the prior art to be uncomfortable, whilst a user with a long vagina may not be able to exercise muscles along the entire length of the vagina. Accordingly, it is preferred that a kit of parts is provided, comprising at least two exercise tubes 10, interchangeable at connector 16 (or interchangeable at three-way connector 21). A relatively "short" exercise tube 10 is proposed having, in its uninflated state, a length of about 30 mm to 40 mm. A relatively "long" exercise tube is also provided having, in its uninflated state, a length of about 40 mm to 70 mm. A third exercise tube having an even longer length may also be provided, such that a user with a long vagina can exercise the muscles along the entire length of the vagina. A further exercise tube may be provided in the kit, with larger dimensions, smaller dimensions, intermediate size dimensions, or a different ratio of length to diameter. In this way, it is not necessary for a user to specify her size at the time of purchasing or ordering the entire apparatus.
The user can experiment with different lengths until she finds the size most suitable for her own body.

Since the exercise tubes are capable of expanding radially upon inflation, it is not necessary to provide exercise tubes having different external diameters in order to account for the different internal diameters of different users’ vaginas. Preferably, all exercise tubes have an external diameter in the uninflated state of about 12 to 15 mm; this small diameter allows for easy insertion into the vagina. The exercise tubes are capable of expanding upon inflation to fit comfortably in any diameter of vagina and, when so inflated, to exert sufficient pressure upon the vagina to enable effective exercising. Thus, a small volume of air is pumped into an exercise tube to allow its use in a vagina of small diameter, whilst a larger volume of air is pumped into the tube to cause greater expansion and thereby allow its use in a vagina of larger diameter.

The apparatus to the right of exercise tube 10 in Fig. 1 is universal to all different sizes of exercise tube, and is therefore reusable with different exercise tubes attached. With connector 16 (or connector 21) being connectable and disconnectable by the user, the exercise tube 10 can be replaced if it becomes damaged or is no longer considered hygienic and can be replaced with a new exercise tube. The connectors 16 and 21 can be any suitable type of connector that provides a substantially airtight connection when the apparatus is in the pressurised state, and that allows for detachment and attachment of the exercise tube 10.

Figure 1 shows an analogue pressure gauge. The gauge is preferably marked in gradations of mmHg, with coloured sectors. A first coloured sector at about 20 to 60 mmHg indicates a non-operative low-pressure range. At about 60 to 100 mmHg a further colour sector indicates a low-pressure operational range. At 100 to 160 mmHg a different coloured sector indicates medium
pressure operational range. At 160 to 240 mmHg, a further coloured sector indicates high-pressure operational range. A further sector at 240 to 300 mmHg shows extra high or excessive pressure. As noted previously, these pressure values are purely illustrative. In use, a user can readily see which is her preferred operational range, and she can readily see whether she is achieving an increase in pressure to a higher range.

Instead of an absolute pressure gauge, a relative pressure gauge can be used, indicating increased pressure from a base line. For example, a digital gauge can be used, with an integrator circuit showing the integral of pressure and time, thereby indicating the extent to which the user is able to increase pressure and hold that pressure over time. Alternatively, a differentiator could be used, indicating the speed of contraction of the user’s muscles. A selector switch could be provided to select different modes (absolute, integrator, differentiator).

Audible feedback

The pressure feedback need not be exclusively visual. In a particularly preferred embodiment of the invention, audible feedback is provided. The audible feedback can be as simple as a voltage-controlled oscillator which modulates frequency with pressure, with a higher frequency indicating higher pressure. Alternatively it could be amplitude modulated, with a louder tone indicating higher pressure. If frequency modulation is used, it can be modulated in steps, encouraging the user to increase the pressure to the next higher tone.

Audible pressure feedback has the particular advantage that the user does not need to see any gauge. This means the elongate tube 20 (or 100 in Fig. 2) is inessential. The central tube 11 can be integrally formed with other parts of the device into a single integrated plastic device.
In a preferred embodiment, pre-recorded voice can be used for feedback. E.g. a digital recording of a phrase can be stored, such as “Well done!”. Instead of a voice, a musical tune or ring tone can be provided, with different ring tones for different levels of pressure. For example, different voice messages or tunes can be played at thresholds of 60 mmHg, 100 mmHg, 160 mmHg and 240 mmHg. Means may be provided to allow a user to record a sound (such as music or a voice message etc) for playback upon achieving a particular pressure; suitable means for recording sound are known by those skilled in the art.

A means (such as a switch) may be provided for turning the sound on and off. In embodiments that comprise vibrating elements (described in more detail below), the sound and vibration can preferably be turned on and off independently of each other.

**Alternative embodiment**

Hygiene is important, and the device of Fig. 1 has many parts to be kept clean. A more aesthetically simple arrangement is illustrated in Fig. 2. The exercise tube 10 is connected to an elongated plastic tube 100 (preferably removably connected to the tube). The tube 100 is connected to a unitary pressurising and measuring device 110, comprising a pressure gauge 101, a manual adjuster 102 and a pump 103. Between the adjuster 102 and the pump 103 is a button valve 104 for release of pressure. In use, the pump 103 is squeezed, causing air to be pushed through the valve 104, thereby increasing the pressure in all the elements to the left of valve 104. When a desired pressure is measured on the gauge 101, the pressure can be adjusted using adjuster 102.
It will be appreciated that compromise arrangements between the device of Fig. 1 (having up to six different elongate plastic tubes) and the device of Fig. 2 (having a single tube 100) can be designed within the scope of the invention. For example, the pump 103 and adjuster 102 can be integrated, with the gauge 101 being separate. Alternatively, the gauge 101 and adjuster 102 can be integrated, with the pump 103 being separate. Alternatively, the gauge 101 and pump 103 can be integrated, with the adjuster 102 being separate. The adjuster 102 is optional and can be omitted altogether. In Fig. 2, the gauge 101 and adjuster 102 can be reversed in position.

**Vibrating Stimulator Attachments**

Referring to Fig. 3, a preferred arrangement is illustrated, in which a vibrator 200 is provided in association with the vaginal exercise tube 10. The vibrator 200 can be a small electrical motorised vibrator of a type commonly available. It may be integrated in a unitary elastomeric housing with the exercise tube 10, as illustrated in Fig. 3. Alternatively, it may be quite separate so that the user can position the vibrator in any desired position. As illustrated in Fig. 3, a wire 202 is provided to supply battery electricity to the vibrator 200. The vibrator 200 may alternatively be powered with a mains electricity supply, using an appropriate power transformer and rectifier. A means, such as a switch (not shown), is provided to enable the vibrator to be turned on and off. The wire 202 runs along the air tube 204 that connects the exercise tube 10 to its pump and pressure gauge (generally illustrated at 206). In this arrangement, a battery compartment 208 is provided in association with the pressure gauge or any of the other components of the device.

In the preferred embodiment, the vibrator 200 is a clitoral stimulator. That is to say, it is positioned in an integrated position relative to the exercise tube 10 such that, when the exercise tube 10 is inserted into the vagina, the vibrator 200 is located at or near the clitoris.
Clitoral stimulation is particularly advantageous during vaginal muscular exercise. Stimulation of the clitoris by vibration enhances vaginal muscle contraction. With the benefit of clitoral stimulation, the user is facilitated in achieving greater vaginal muscle contraction. Indeed, when vaginal muscle contraction can be achieved through clitoral stimulation alone, the degree of muscular contraction can be measured using the pressure gauge.

In preferred embodiments, the vibrator 200 has a modular design whereby a plurality of vibrating attachments are provided. The vibrating attachments are attachable to, and detachable from, the exercise tube 10. The vibrating attachments and exercise tube comprise, for example, a co-operating plug and socket arrangement to provide a detachable electrical and mechanical connection. The vibrating attachments may have different sizes, shapes and surface textures. For example, some vibrating attachments may have a smooth surface, whilst others may comprise surface protrusions such as ridges or nodules. The vibrating attachments may be adapted such that their position can be adjusted (for example, by the provision of one or more pivots and/or telescopically extendable sections) to enable optimal stimulation of a preferred portion of the clitoris or perineum.

The features of detachably attachable vibrating attachments and repositionable vibrating elements may be provided independently. Hence, an aspect of the present invention provides a conventional vibrator (of any suitable design known to those skilled in the art) comprising means for receiving a detachably attachable vibrating element for clitoral and/or perineal stimulation. A further aspect of the present invention provides a conventional vibrator comprising a positionable vibrating element to enable simulation of a preferred region of the genitals. A conventional vibrator may also be provided with a vibrating attachment that is both positionable and detachably attachable.
Anal Use

The exercise tube can be inserted into the anus. The exercise tube 10 is inserted into the anus in its uninflated state and then inflated until it expands to a comfortable external diameter. The exercise tube can be used anally by both males and females to improve the tone of their anal pelvic floor muscles by squeezing the exercise tube using the anal muscles (in a manner similar to that previously described for vaginal use). The exercise tube is particularly advantageous when used by a male since, upon expansion, the exercise tube pushes against the prostate gland which some users may find to be pleasurable.

When the exercise tube comprises a vibrator 200 as shown in Fig. 3, the exercise tube can be inserted such that the vibrator massages the perineum. A preferred embodiment comprises a vibrator 200 that is adaptable to provide both optimal clitoral stimulation when used vaginally and optimal perineal stimulation when used anally. In this embodiment, the vibrator is pivotable about the housing of the exercise tube and/or capable of being extended outwards from the housing of the exercise tube. This can allow the position of the vibrator 200 to be changed according to whether the exercise tube is to be used vaginally or anally. In this manner, the vibrator 200 can be placed in a first position to enable stimulation of the clitoris when used vaginally. When used anally, the vibrator 200 can be moved to a second position in order to allow the most sensitive regions of the perineum to be stimulated. In an embodiment where a plurality of exercise tubes of different lengths are provided, a shorter exercise tube may be provided specifically for anal use.

It will be appreciated that that terms "vaginal muscle exercise device" and "vaginal muscle exercise tube" encompass, where appropriate, such devices and tubes that are suitable for anal use.
Additional Attachments

Referring now to Fig. 4, an arrangement similar to that of Fig. 3 is illustrated, with the attachment of an additional vibrator 300. This is an anal stimulator. It is electrically connected to the same battery source as the clitoral stimulator 200 by means of wires 302. Preferably, the wires 302 pass along a strong, resilient plastic tube to the vibrator 300, so that the two vibrators 200 and 300 are flexibly connected, yet resilient against dislodging of the wires. Other arrangements can be envisaged. The exercise tube 10, clitoral stimulator 200 and anal stimulator 300 may all be housed in an integral elastomeric housing. These elements may be connectable and disconnectable from the other parts of the apparatus by an air tube connector and an electrical plug and socket.

A kit of parts may be packaged together and offered for sale as a package, including one or more vaginal exercise tubes 10 of different sizes and/or shapes. The kit may include a tube having an integral clitoral stimulator or vibrator. It may also or alternatively include a separate vibrator for general use. It may also or alternatively include a vibrator adapted for insertion into the anus, either separate or integral with a vaginal exercise tube.

The various embodiments of the invention have been given by way of example. Combinations of the various aspects described can be readily envisaged by one of ordinary skill in the art without inventive activity, and all such combinations and modifications are included within the scope of the invention as defined by the following claims.
CLAIMS

1. A vaginal muscle exercise device comprising:
   an inflatable vaginal muscle exercise tube;
   an air pump; and
   an audible pressure gauge connected to the exercise tube, wherein the
   audible pressure gauge is arranged to provide an audible indication of
   pressure in the tube.

2. A device in accordance with claim 1, wherein the audible pressure
   gauge gives and audible indication of relative pressure.

3. A device in accordance with claim 1 or 2, having storage means for
   storing pre-recorded voice messages, wherein the pressure gauge is arranged
   to annunciate a selected message dependent on the pressure.

4. A device in accordance with claim 1 or 2, having storage means for
   storing one or more pre-recorded tunes, wherein the pressure gauge is
   arranged to play a selected tune dependent on the pressure.

5. A device in accordance with any one of claims 1 to 4, further
   comprising a vibrator.

6. A device in accordance with claim 5, wherein the vibrator is integrally
   formed with the exercise tube.

7. A vaginal muscle exercise device comprising:
   an inflatable vaginal muscle exercise tube;
   an air pump and pressure gauge connected to the exercise tube; and
   at least one vibrator adapted for use in association with the exercise
   tube.
8. A device in accordance with claim 7, wherein the vibrator is integrally formed with the exercise tube and positioned for clitoral stimulation.

9. A device in accordance with claim 7 or 8, comprising a vibrator integrally formed with the exercise tube, the vibrator being positioned and adapted for anal stimulation.

10. A device in accordance with any one of claims 7 to 9, comprising a unitary housing for housing the air pump and pressure gauge, the housing having a battery compartment for holding a battery, and wires for supplying electricity from the battery to the or each vibrator.

11. A device in accordance with any one of claims 7 to 10, wherein the exercise tube has a central tube of relatively resilient polymeric material, a first layer of relatively soft resin surrounding the central tube, and a second layer of airtight silicone surrounding the layer of soft resin and connection means at a proximal end for airtight engagement with the air pump and pressure gauge.

12. A device in accordance with any one of the claims 7 to 11, wherein the pressure gauge indicates relative pressure.

13. A device in accordance with claim 12, wherein the pressure gauge provides an audible indication of relative pressure.

14. An apparatus substantially as herein described and/or as illustrated in any one or more of the accompanying drawings.
Application No: GB0623215.1
Claims searched: 1 - 6, 14
Examiner: Mr Niels Mathiesen
Date of search: 27 February 2007

**Patents Act 1977: Search Report under Section 17**

**Documents considered to be relevant:**

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<td>GB 808867 A (SOKOL) See fig. 1 and whole document</td>
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<td>US 4476880 A (GIEM et al.) See column 4, line 13-22</td>
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<td>RU 2020912 C (AGARKOV SERGEJ T.) See abstract</td>
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**Categories:**

X  Document indicating lack of novelty or inventive step  
Y  Document indicating lack of inventive step if combined with one or more other documents of same category  
&  Member of the same patent family  
A  Document indicating technological background and/or state of the art  
P  Document published on or after the declared priority date but before the filing date of this invention  
E  Patent document published on or after, but with priority date earlier than, the filing date of this application  

**Field of Search:**

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC:

Worldwide search of patent documents classified in the following areas of the IPC:

A61B; A61H; A63B

The following online and other databases have been used in the preparation of this search report:

EPODOC, WPI
Patents Act 1977
Further Search Report under Section 17

Documents considered to be relevant:

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- & Member of the same patent family
- A Document indicating technological background and/or state of the art.
- P Document published on or after the declared priority date but before the filing date of this invention
- E Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:
Search of GB, EP, WO & US patent documents classified in the following areas of the UKC:

- Worldwide search of patent documents classified in the following areas of the IPC
- A61B; A61H
- The following online and other databases have been used in the preparation of this search report
- WPI, EPODOC

International Classification:

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