

THE JOINT EXAMINATION BOARD

PAPER P4

AMENDMENT OF SPECIFICATIONS FOR UNITED KINGDOM PATENT APPLICATIONS IN PROSECUTION, REVOCATION PROCEEDINGS OR OTHERWISE

15th November 2001

10.00 a.m. – 1.00 p.m.

Please read the following instructions carefully. Time Allowed – **THREE HOURS**

1. Where a question permits, reasons should be given for the conclusions reached.
2. Start each question (**but not necessarily each part of each question**) on a fresh sheet of paper. In the appropriate boxes at the top of each sheet please enter the designation of the paper, the question number, and your Examination number. Write on **ONE SIDE** of the paper only using **BLACK** ink. You must **NOT** staple pages together. You must **NOT** state your name anywhere in the answers.
3. **Unless specifically requested answers are NOT required in letter form.**
4. **NO** printed matter or other written material may be taken into the examination room.
5. Answers **MUST** be legible. If the examiners cannot read a candidate's answer no marks will be awarded.
6. **NO** writing whatsoever, including number of papers, is allowed prior to the commencement of the examination or after it has finished.
7. **At the end of the examination please double check that you have fully complied with instruction 2 and assemble your answers in question number order to hand in.**

This paper consists of **twenty five** pages including this page

Page 1 of 25

Please put your answers in **QUESTION NUMBER ORDER** before placing them in the envelope provided.

THE JOINT EXAMINATION BOARD

PAPER P4

AMENDMENT OF SPECIFICATIONS FOR UNITED KINGDOM PATENT
APPLICATIONS IN PROSECUTION, REVOCATION PROCEEDINGS OR
OTHERWISE

15TH NOVEMBER, 2001

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INSTRUCTIONS TO CANDIDATES

In this paper, you should assume that a United Kingdom patent application comprising the attached specification (identified as GB 0011223.4) has been filed and that the UK Patent Office has issued the attached Official Letter. You have reported the Official Letter to your client and have received instructions for response in the form of the attached letter.

Your task is to prepare the following:

1. A letter to the UK Patent Office in response to the Official Letter, accompanied by a set of amended claims if appropriate. (Please note that for the purposes of this examination you are **not** required to propose any amendments to the description of the patent application.)
2. A memorandum consisting of notes to provide the basis of advice and comment to your client explaining the actions you have taken and the reasons for those actions. These notes should be restricted to patent matters; you are **not** required to consider any other matters such as copyright or design protection.

You should accept the facts given in the paper and base your answer on those facts. In particular, you should **not** make use of any special knowledge that you may have of the subject matter concerned, and you must assume that the prior art referred to is in fact exhaustive. Where only extracts of documents are presented, you should assume that those extracts contain all relevant material.

If your advice to your client includes a suggestion that one or more divisional applications should be filed, you should draft independent claim(s) for the or each divisional and your memorandum should indicate your grounds for believing why the filing of such divisional application or applications is advisable. You should **not**, repeat **not**, draft a description or any dependent claims for a divisional application.

If you submit amended claims and/or independent claim(s) for a divisional application, please place these at the top of your papers when handing in your answer.

Your Reference: XYZ/PAT/01
Application No: GB 0011223.4
Applicant: Padbutt Limited

Examiner: O. Chronos

Latest date for reply: 1 December 2001

Patents Act 1977
Examination Report under Section 18(3)

1. The invention as defined in claim 1 at least is not new and/or is obvious in view of the disclosure of:

GB 1234567
GB 2020202 A

2. The scope of the invention is rendered unclear by the presence of three independent claims in the application, namely claims 1, 4 and 6, which use different terminology. An objection to plurality of invention may arise unless the claims are amended so as to be clear and concise.

Letter from Client

17 October 2001

Dear Patent Attorney,

Thank you for your report enclosing the Examiner's comments on our patent application for the Padbutt Inflatable Protector.

I find it difficult to understand how the Examiner can confuse our invention with the items disclosed in the documents you sent me - especially as one of them is a life-saving flotation device. It really seems a waste of my valuable time to go into minutiae over such things; I'm sure you can use your skills to differentiate the invention from these older devices.

Regarding the second objection, you comment in your letter that there is a possibility of filing a divisional application - which I take to mean that the present application would be split up, one application keeping a claim like present claim 1, another keeping a claim like present claim 4 and the third keeping a claim like present claim 6. Is that what you had in mind? I would prefer you to avoid doing this sort of split, since our budget has been severely stretched by our recent acquisition of our French competitor, Soufflets Sommes Nous SA.

You will recall that the Padbutt Inflatable Protector originated from our US subsidiary, Fallguys, Inc., and their patents people were responsible for the originally filed US text which, because of time pressures, had to be used in the UK as well. Perhaps you will be able to get round the problem without splitting the application.

I would normally prefer to review your proposals prior to submitting them to the Patent Office, but on this occasion you will have to go it alone since I am about to leave for our annual industry conference which is being held this year in Patagonia.

Yours sincerely

Ted Bottomley
CEO, Padbutt Limited

GB0011223.4INFLATABLE PROTECTION DEVICE

Hip fractures are a major health and economic problem for the elderly and our society as a whole. Treatment for
5 hip fractures includes surgery and prolonged periods of bed rest, both of which expose patients to significant complications such as infection and pneumonia. After hip fracture, many elderly patients may need to further restrict their activities, need a "walker", be confined to
10 a wheelchair and often require full or part-time assistance. As a significant cause of disability and death in the elderly, the number and importance of hip fractures will surely increase as the number and percentage of the elderly increases.

15 The hip joint is a ball and socket. The lateral hip is particularly vulnerable to injury and fracture. This vulnerability results from the lateral position and relatively thin layer of overlying muscle and fat.

20 There has been little progress in the prevention of hip fractures despite our growing knowledge about contributing factors.

The instant protective device is a marked improvement over the design and function of the prior art devices for a number of significant reasons. These reasons and other
25 unique features of the invention will be fully discussed.

The present invention, in contrast to prior art, does not depend on multiple separate inflatable chambers for coverage of the body areas to be protected. Such devices may not fully protect all the areas if one of the
30 inflatable air chambers fails to inflate and fully expand. This is because the inflation and movement of any one air chamber to cover an area of the body is dependent upon the full inflation and movement of the adjacent chambers. This is particularly true for the uppermost and lowermost
35 body areas protected by the device.

In contrast, the present protective device is comprised of an airbag with portions folded, typically into several pleats, and contained with the device, which on inflation expand out of the protective device to cover the entire body area to be protected. Inflation and expansion are not hindered by internal attachments between the folded portions.

The protective device is like a belt or cummerbund and is worn over clothing about the waist.

When the folded portions of the airbag expand and inflate, the resultant inflated state should be such that there is a protective area above the belt as well as a larger protective area below the belt. Preferably, the belt is approximately three inches in height and the airbag assembly expands approximately three inches upward and seven inches downward when it is inflated.

The protective device described in this application fills an important need in preventive medical care for the elderly. The invention for the first time provides a simple, comfortable, easily worn self-contained, automatic device which provides maximum protection to the hip, pelvis, buttocks and coccyx areas in falls and does not interfere with activities of daily living.

The protective device may be held in place by either overlapping Velcro-type strips (hook and loop type fastening pads or strips) or by a traditional fastening such as strap and loop securing arrangements. The protection device has the following advantageous features:

- a) the protective device is a belt-like or cummerbund-like garment worn comfortably about the waist.
- b) the protective device can be easily put on, adjusted to fit comfortably and removed by a person who is elderly, infirm or whose fingers, hands and grip have been weakened by arthritis and/or other neuromuscular conditions, or by a caregiver with minimal exertion and/or lifting. The invention does not have multiple straps, wraps, buttons or zippers. Anyone either the wearer or an

attendant, who can put a belt around his/her waist without putting it through belt loops can easily and quickly put on the protective device of this invention or remove it.

5 c) the invention will be designed to be as thin in width and short in height as possible in the uninflated state worn by the user. This will be accomplished with the use of folds or pleats in the material such that when it is uninflated the device is as small as possible. When inflated the folds, e.g. pleats, expand so that the device covers the hips, pelvis, buttocks and coccyx areas as well as a smaller area above the waist of the user.

10 d) the protective device will be kept in position around the waist by a "one size fits all" strap which is an extension of one side of the invention and is placed across the other end of the invention and adheres to it by means of a Velcro-type strip on the respective insides of the strap and outsides of the other end of the protective device. Alternatively, a simple buckle system can be used. The protective device may be secured around the waist of the user by either configuration.

15 e) the invention will contain an inflatable airbag assembly, positioned so as to completely surround the hips, pelvis, buttocks and coccyx areas when inflated.

20 f) the device of the invention will be inflated by a compressed gas cartridge (or other gas source) fired by a motion detection triggering device. The device will work as follows: when the device senses body movement of a selected and predetermined acceleration (equal to or greater than the acceleration which occurs during a fall) and senses downward angular motion of selected and predetermined magnitude the device will signal the triggering mechanism to fire. This will release compressed gas from the compressed gas cartridge inflating the invention.

25 30 35 g) the motion sensor will contain logic controlled circuits which will not permit inflation of the airbag assembly unless signals are received indicating both

sufficient acceleration of the body and sufficient downward angular motion.

5 i) the motion sensors may be either types of mercury switches or accelerometers or a combination of both. When predetermined rates of acceleration and downward angular motion are both detected by the sensor, the triggering mechanism will be activated causing the compressed gas cartridge to discharge thus inflating the invention.

10 ii) the signal from the sensors will drive piezoelectric crystals and/or cause small lightweight long-lasting batteries to activate the triggering device causing the discharge of the compressed gas cartridge and the inflation of the invention.

15 h) the device of the invention, when inflated, expands to cover the hip, pelvis, buttocks and coccyx areas. It does not need to cover the whole body.

i) the device of the invention maintains its inflation and impact absorbing quality until the manual relief valve is manually opened and the gas inside the
20 airbag assembly escapes.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of the invention.

25 Fig. 2 is a perspective front view of the uninflated invention worn in position around the waist of a user.

Fig. 3 is a perspective front view of the inflated invention worn in position around the waist for a user who has fallen.

30 Fig. 4 is a cross-sectional view of the uninflated device taken along line 4-4 of Fig. 1.

Fig. 5 is a cross-sectional view of the inflated device with the pleats expanded by gas pressure.

35 Fig. 6 is an enlarged view of the pocket containing the compressed gas cartridge, motion sensing devices, solenoid valve, battery and manual relief valve for deflation.

Fig. 7 is a cross-sectional view taken along line 7-7- of Fig. 6.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Fig. 1 is a perspective view of a preferred embodiment of the present protective device. In this embodiment the invention is a belt or cummerbund-like garment 12. The invention is worn about the waist and kept in place by means of Velcro-type hook and loop securing areas 14 and 16 on the inside of the right end of the invention and on the outside of the left end of the protective system.

Fig. 2 is a perspective front view of the uninflated protective device 12 worn in position around the waist of the user 18. Because it is light, compact, held in place by Velcro-type hook and loop securing areas like a belt, it can be easily put on, adjusted to fit comfortably and removed by a person who is elderly, infirm, or whose fingers, hand and grip have been weakened by arthritis and/or other neuromuscular conditions or by a caregiver. This can be accomplished by the wearer or a caregiver/attendant with minimal exertion, lifting, or adjustment of multiple straps, wraps, buttons or zippers. The invention is made of light, strong, long-lasting, abrasion-resistant close weave material, such as the Neoprene coated woven Nylon used in airbag devices. Such fabric is strong enough, when tightly woven, to hold the increase in gas pressure which occurs when the user 18 falls against the ground or another incompressible object.

Fig. 3 is a perspective front view of the inflated protective device 12 on a user 18 who has fallen. The protective device 12 as shown in Fig. 4 includes an outer enclosing surface 20 and inner pleats and Velcro-type hook and loop closures 24 and 26 to hold the pleated portions of the airbag assembly in their compact uninflated configuration. Referring again to Fig. 3, note that the pleats 22 have inflated and expanded, pushing open the

Velcro-type closure strips 24 and 26. When inflated the protective device covers the entire hip, pelvis, buttocks and coccyx areas. As indicated by the transverse lines on the expanded airbag assembly as shown in Fig. 3, the airbag assembly includes cross-ties 27 or other similar arrangements for preventing undue outward ballooning of the airbag assembly and to restrain it to the desired protective configuration as shown in Fig. 3. The thickness of the airbag assembly in its inflated state is such that it does not function as a fulcrum causing body parts outside the area covered by the airbag to strike the ground or other objects with greater force than they would have otherwise.

Fig. 4 is a cross-sectional view of the uninflated protective device 12. It demonstrates the folds or pleats 22 inside the protective device 12. Upon inflation, the pleats expand and force open the thin Velcro-type closure strips 24 and 26, which in the uninflated state keep the folded pleats 22 inside the outer enclosing surface 20.

Fig. 5 is an enlarged cross-sectional view of the inflated protective device 12. This view demonstrates the separation of the Velcro-type closure strips 24 and 26 and the position of the unfolded pleats 22 which have expanded and cover the hips, pelvis, buttocks and coccyx of the user (see Fig. 3).

Fig. 6 is an enlarged cut away view of the pocket 40 containing the compressed gas cartridge 30, the motion sensor 32, the solenoid valve 34, the battery 42 and the manual deflation valve 36. The pocket is opened with a zipper 38 so as to allow sufficient room for removal, replacement or repair of any of its components including the compressed gas cartridge 30, the sensor 32, the solenoid valve 34 or the battery 42.

The steps involved in the inflation of the invention when the wearer falls are as follows: The sensor 32 detects the downward acceleration and angular motion, and causes the activation of the solenoid valve 34 to

- 7 -

discharge the compressed gas cartridge 30, allowing the compressed gas to escape into the airbag assembly thus causing inflation and expansion of the pleats 22 to cover and protect the hip, pelvis, buttocks and coccyx (see
5 Fig. 3).

Fig. 7 is a cross sectional view through the pocket taken along line 7-7 of Fig. 6. The reference numbers from Fig. 6 are carried over to the corresponding components in Fig. 7 including the battery 42 which powers
10 the sensors 32 and the solenoid valve 34. Incidentally the sensors 32 may include acceleration and orientation sensors of any desired type including, but not limited to, a pendulous mass, a mercury switch and/or an
15 accelerometer. Foam blocks 44a and 44b may be used to prevent movement of the battery, sensors, solenoid valve and gas cylinder.

It is to be understood that the foregoing detailed description and accompanying drawings relate to a preferred illustrative embodiment of the invention.
20 However, various changes and modifications may be made without departing from the spirit and scope of the invention as defined in the appended claims.

CLAIMS

1. An inflatable protective device intended to be worn about the body of a user, which device comprises:
an inflatable airbag;
5 a belt adapted to accommodate said airbag in its uninflated condition; and
means for inflating said airbag in response to a situation likely to endanger the user.
2. A device as claimed in claim 1, further comprising a
10 first sensor detecting angular movement and a second sensor for detecting acceleration, said sensors producing a signal indicative of a predetermined combination of acceleration and angular movement, the predetermined combination corresponding to a fall.
- 15 3. A device as claimed in claim 1, further comprising a gas source adapted to release gas into said airbag assembly in response to said signal.
4. A protective system worn outside clothing for preventing injuries to the user as a result of falls, the
20 system comprising:
an elongated inflatable airbag assembly having upper and lower parts folded into pleats and adapted to cover the hips, pelvis, buttocks and coccyx areas of the user's body when in an inflated state;
25 a belt for supporting said airbag assembly around the waist of a user, said belt defining a cavity and said airbag assembly being substantially within said cavity when in an uninflated state;
a sensor detecting angular movement and a sensor for
30 detecting acceleration, said sensors producing a signal indicative of a predetermined combination of acceleration and angular movement, the predetermined combination corresponding to a fall; and

a gas source adapted to release gas into said airbag assembly in response to said signal.

5 5. A system as defined in claim 4, wherein said belt is approximately three inches in height and said airbag assembly expands approximately three inches upward and seven inches downward when gas from said cartridge is released and causes inflation of said airbag assembly.

10 6. A protective system for preventing injuries to at least one of the hips, pelvis, buttocks and coccyx of a user, the system comprising:

an elongate inflatable airbag assembly;

15 a belt for supporting said airbag assembly around the waist of a user, said belt having a cavity associated therewith and said airbag assembly being housed substantially within said cavity when uninflated;

sensing means for sensing acceleration and angular movement and for producing a signal indicative of a predetermined combination of acceleration and angular movement, the predetermined combination corresponding to a fall; and

20

inflating means for inflating said airbag assembly to an expanded configuration in response to said signal.

7. A system as defined in claim 6, wherein said inflating means comprises a gas cartridge and a

25 lightweight solenoid valve which releases compressed gas from said cartridge into said airbag assembly.

8. A system as defined in claim 7, wherein said airbag assembly covers at least one of the hips, pelvis, buttocks and coccyx of the user when in an inflated state.

30 9. A system as claimed in claim 6, wherein said inflatable airbag assembly is arranged so that, when

- 10 -

inflated, it extends upwardly from said belt as well as downwardly therefrom.

FIG. 2.

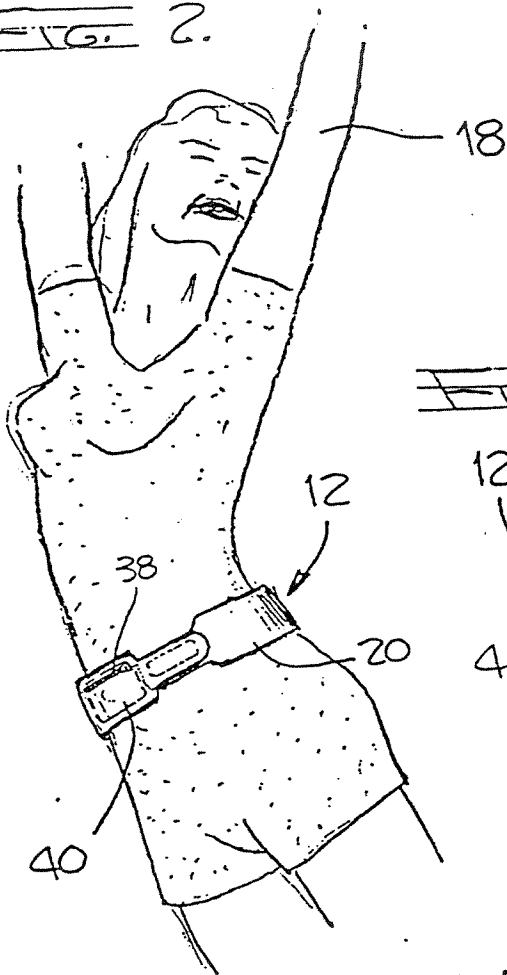


FIG. 4.

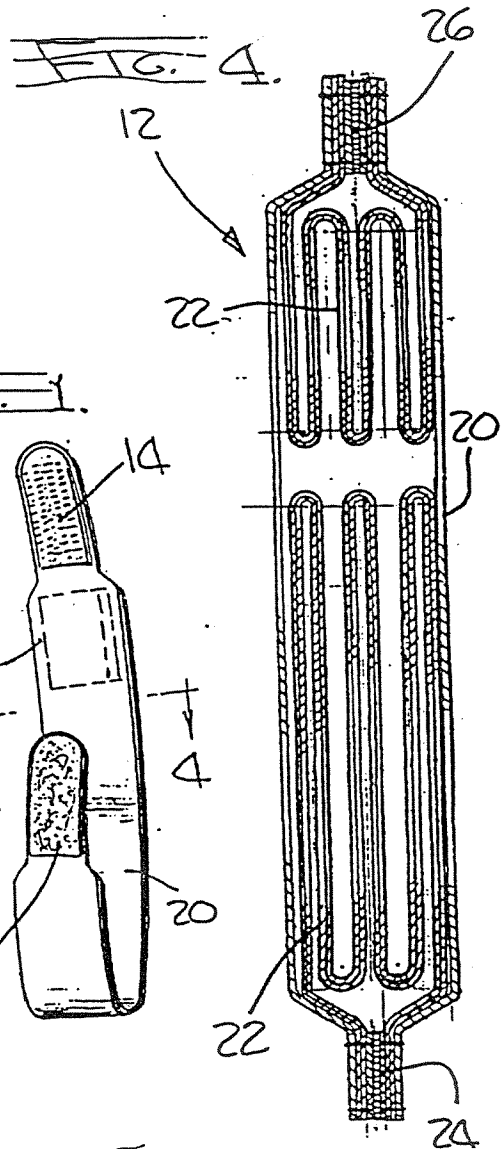
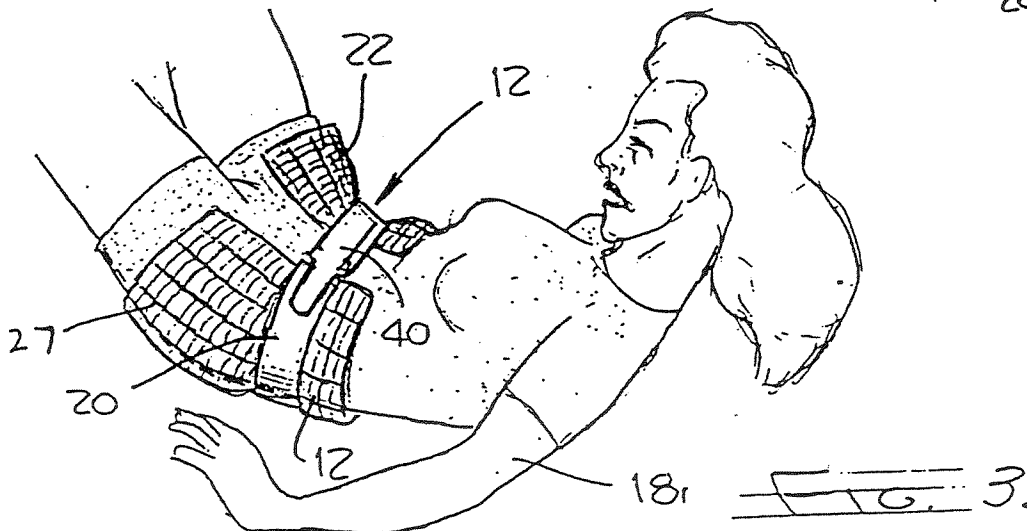
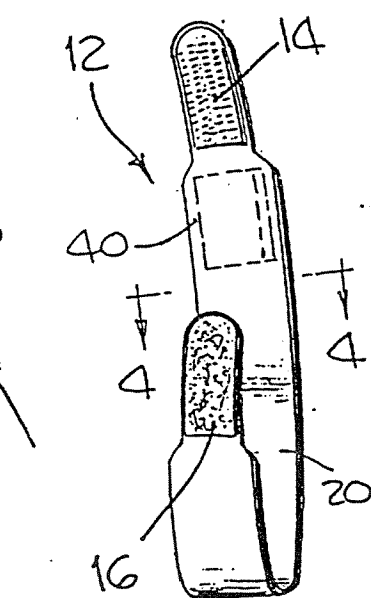
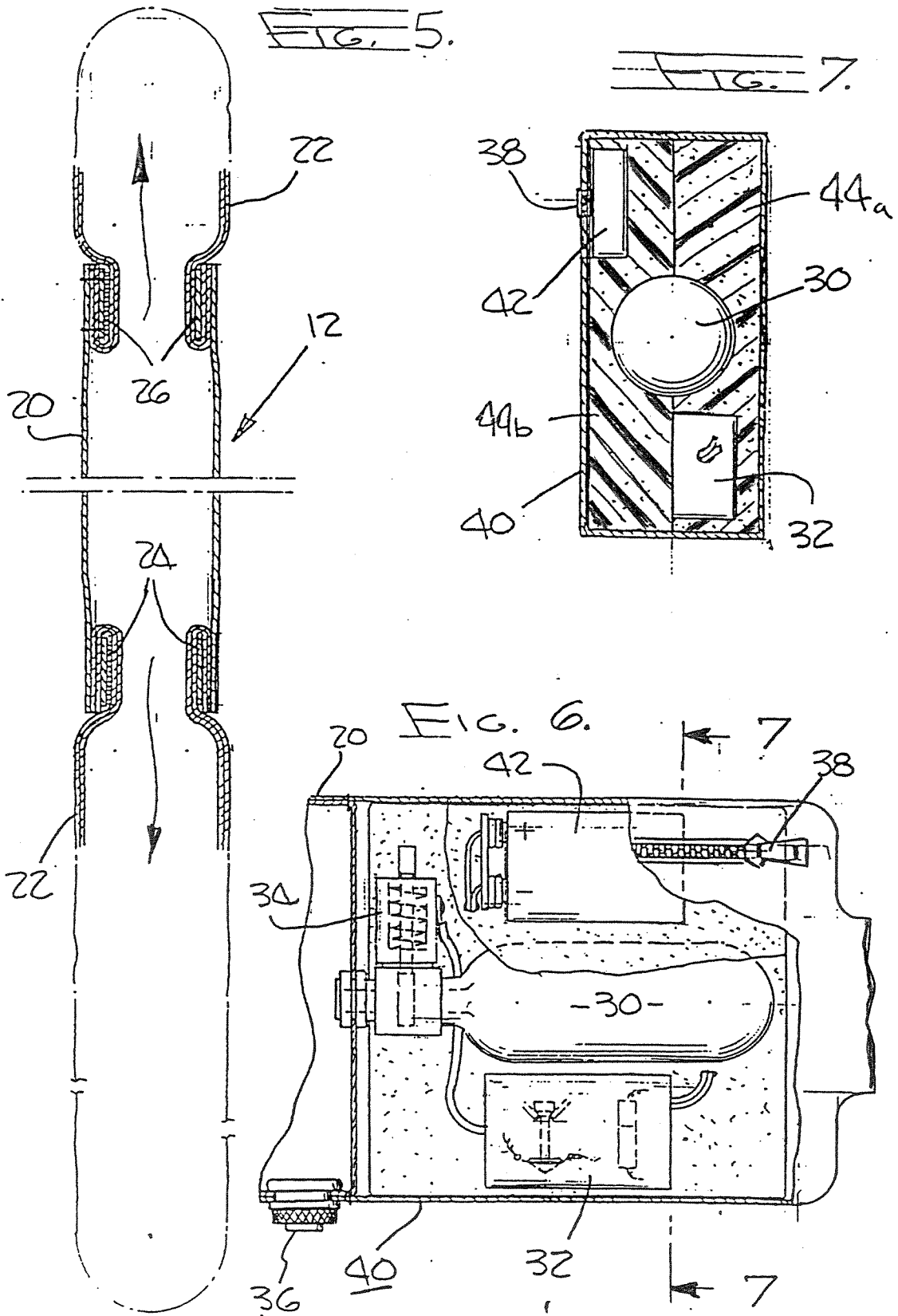


FIG. 1.





GB 1234567Device for Preventing Fractures
of the Femur in Elderly People

This invention relates to a device for preventing
5 fractures of the neck of the femur in elderly people.
With advancing age, the mechanical resistance of human
bone material tends to decrease and, in certain cases, can
become quite fragile. This, together with the decreased
stability found in the elderly, can greatly increase the
10 chance of fractures, the neck of the femur being
particularly vulnerable in this regard.

Despite the progress in general surgery, there is
still a need to reduce the frequency of such fractures and
to minimise the complications which may arise when an
15 elderly patient falls. If the neck of the femur is
broken, the patient generally needs to spend several weeks
in hospital, a considerable part of which will be in a
supine position, which may lead to complications such as:
muscular atrophy leading to a reduction in the general
20 well being of the patient; a reduction in the patient's
motor capabilities; and increased apprehension of further
possible accidents.

The present invention aims to provide a device which
can be worn comfortably by the user and which acts to
25 protect the femoral regions of the user in the event of a
fall. More particularly, the present invention provides
an apparatus for preventing fractures of the neck of the
femur, which device comprises a support element adapted to
be fixed in an immovable fashion at the waist of the user,
30 and a plurality of inflatable elements attached to said
support, characterised in that (a) said support element,
in use, is fixed at the waist of the user; (b) the
inflatable elements extend downwardly from said support
element both in the inflated and the uninflated condition,
35 the extent of said inflatable elements being from the

waist of the user to mid-thigh level; (c) said inflatable elements, when inflated, become sausage-shaped; and (d) the device further comprises means for inflating said inflatable elements in less than 0.3 seconds, this time
5 corresponding to a free fall of approximately 45cms from a standing position.

In order to provide adequate protection of the neck of the femur, the inflatable elements of the device of this invention must be located around the hips of the
10 wearer, i.e. at the sides of the body. The inflatable elements may also be positioned over the user's buttocks, but in general, it is not necessary or desirable for the inflatable elements to cover the frontal area of the pelvis.

15 The invention will now be described with reference to the accompanying drawings, in which:

Figure 1a is a front view of a preferred embodiment of the present invention; and

20 Figure 1b is a rear view of the device shown in Figure 1a.

Referring to the drawings, the protective device of this invention comprises a belt (1) and, depending therefrom, a skirt (10) designed to surround the bones of the lower abdomen and the muscles of the lower back and
25 buttocks. The element (10) carries on its outside a series of inflatable pockets (3) (see Figure 1b). These inflatable elements, in their uninflated condition, lie flat against the body of the wearer and, in their inflated condition, assume an overall sausage-like appearance. The
30 inflatable elements (3) are formed of a material which is impermeable to the inflating gas.

As shown in the drawings, inflatable elements (3) are disposed symmetrically about, and generally parallel to the axis of, the spine of the wearer.

35 An essential feature of this invention is that each of the inflatable elements (3) extends over the area to be protected both in its uninflated and its inflated

condition. Such an arrangement is beneficial in that it allows for a simple mode of construction of the device, and also permits the rapid inflation of the inflatable elements (3) which is necessary to provide adequate protection for the wearer. As shown in the drawings, elements (3) extend downwardly from the waist of the wearer to cover the base of the coccyx, the iliac bone and the neck of the femur. The front part of the device is not provided with inflatable elements (3) (as evident from Figure 1a); in this region, the skirt (10) carries an accelerometer (5), an electric battery (50), an inclination detector (51) and an electrical connection (70) which, when the protection device is activated, supplies electrical power from battery (50) to inflation means (71). A safety switch (52) is provided on the front face of belt (1) and serves to de-activate the system automatically when belt (1) is removed from the body of the wearer.

That end of the belt (1) indicated at (2) carries on its inward facing surface a region of Velcro® which cooperates with a corresponding patch of material (not visible in the drawings) located on the outer surface of the opposite end of belt (1).

Inflation means (71) and sensing and electrical components associated therewith are used to inflate the pockets (3). A separate inflation means (71) is provided for each element (3) as shown.

Inflatable elements (3) are fixed securely to skirt (10) and belt (1); the fixture is such that elements (3) cannot move upwardly or downwardly. This ensures that they do not deviate from the areas to be protected when undergoing inflation.

We have found that, in use, it is necessary for the inflatable elements (3) to become fully inflated within a time period of less than 0.3 seconds if adequate protection is to be provided for the wearer of the device. Using inflation means (71) and an actuator (6) of the type

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disclosed in GB2012345A, this result can be achieved with the inventive disposition of inflatable elements as shown in the drawings and with an inflation pressure of as little as 0.3 - 0.5bar.

GB 1234567

FIG. 1B

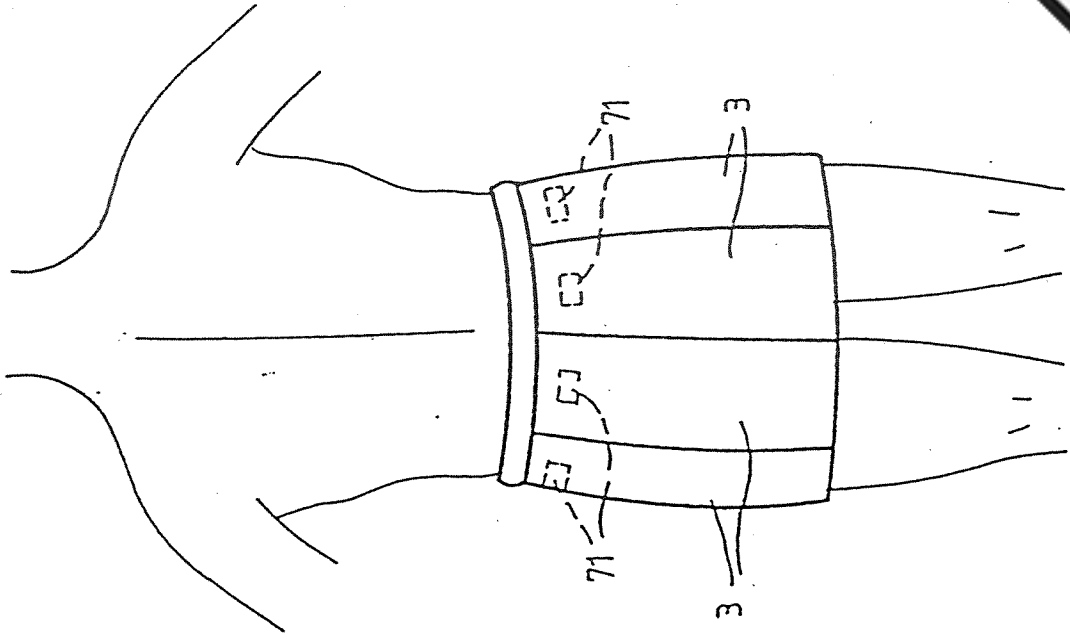
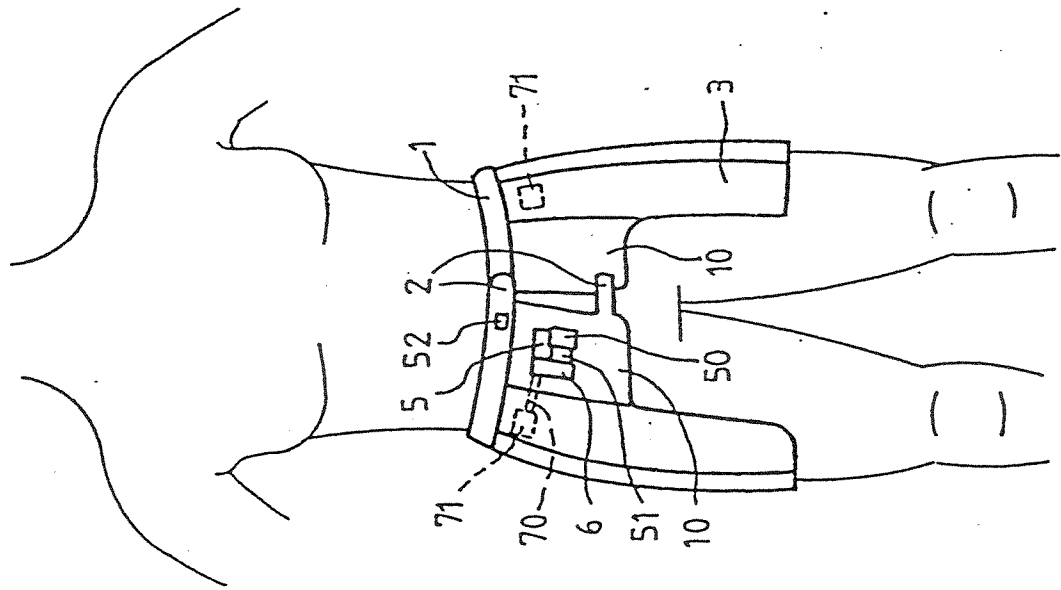


FIG. 1A



GB 2020202ASELF-INFLATING LIFE PRESERVER

The present invention relates to self-inflating life preserver intended to be particularly useful for use in water sports.

Known self-inflating jacket-type life preservers are provided with straps and similar means for holding the device in position on the body of the user. The buoyancy of such preservers, which are usually employed in water sports, is assured by utilising buoyant material such as cork for fabricating the jacket life preservers.

These known life preservers are cumbersome and, when worn, hamper the movement of the user. Furthermore, they are often difficult to put on owing to the difficulty of fastening the straps and similar means.

An object of the present invention is to provide a life preserver which can be worn by the user in its deflated condition around the waist so as not to hamper movement.

A further object of the invention is to provide a life preserver which is able, when inflated, to provide sufficient buoyancy to hold the user's head above the water level.

According to the present invention, there is provided a life preserver which comprises a belt having an inside longitudinal pocket containing a deflated bladder having the form of a double hump, the bladder being inflatable by an automatic inflating device.

For a better understanding of the invention, and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawings, in which:

Figure 1 is a perspective view of a preferred embodiment of life preserver in accordance with the invention;

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Figure 2 is a front view of the life preserver of Figure 1 with the bladder extracted from its pocket;

Figure 3 shows the bladder in isolation;

Figure 4 shows the life preserver in its uninflated state as worn around the waist of a user;

Figure 5 shows the life preserver of Figure 4 in the inflated condition; and

Figure 6 shows the life preserver holding the head of the user above the water level.

Referring to the drawings, the life preserver of this invention comprises a belt (1) having a front portion (2) and a back portion (3). The belt (1) is closed by coupling together a male buckle (4) and a female buckle (5). The front and rear portions of the belt are sewn together by stitching (6) which runs along the lower edge of the belt (1) and up to the ends of the belt so as to define a longitudinal pocket (7) in which a deflated and folded bladder (8) is accommodated.

The bladder (8) is fabricated from a suitable air-impervious material. It has a lower edge (9) which is secured to the bottom of the longitudinal pocket (7) of belt (1). Bladder (8) is in the form of two humps (10 and 11) interconnected by a section (12), the humps being directed away from the lower edge (9) and towards the opening of longitudinal pocket (7) (see Figure 2).

The hump (11) is connected to an inflating device (13) which is fastened to the front portion (2) of belt (1). Device (13) comprises a small cylinder (15) of compressed carbon dioxide and a cord (14) which operates a pin valve to open cylinder (15) and to admit carbon dioxide into the hump (11). Compressed carbon dioxide can pass from hump (11) through connecting portion (12) to hump (10). In addition, a supplementary inflation device (16) is connected to the hump (10) via a one-way valve (not shown). If necessary, the user of the life preserver can top up the pressure in hump (10) by blowing through the inflation device (16).

The belt (1) is provided with fastening portions (17,17') adapted to be engaged together so as reversibly to shorten the total length of the belt (1). These fastening portions can be made of Velcro® material as shown, or they may comprise press-buttons. As can be seen from Figure 1, fastening portions (17,17') are located close to one end of the belt. Similar fastening portions (18,18') are provided inside the longitudinal pocket (7) along the upper edges thereof in order to hold the pocket (7) closed when the folded and deflated bladder (8) is contained therein.

In operation, the belt (1) is worn by the user at waist level (see Figure 4) with the portions (17,17') and (18,18') fastened and with the deflated bladder (8) folded and inserted into longitudinal pocket (7). In order to adapt the size of belt (1) to that of the user's waist, the buckle (4,5) is conventionally regulated.

In order to operate the life preserver in an emergency, the cord (14) is pulled sharply down and this results in the automatic inflation of bladder (8). As the volume of bladder (8) increases, it causes the portions (17,17') and (18,18') to snap open thus allowing the bladder (8) to project from pocket (7). As a result of the buoyancy created by the inflated bladder, the belt (1) rises from the waist level of the wearer to a position around his chest, the limiting factor on upwards movement of the belt being the wearer's armpits. This inflated condition is illustrated in Figure 5. The humps (10 and 11) will now rest under the user's chin and at the nape of his neck, respectively, thus holding the user's head well clear of the water as illustrated in Figure 6.

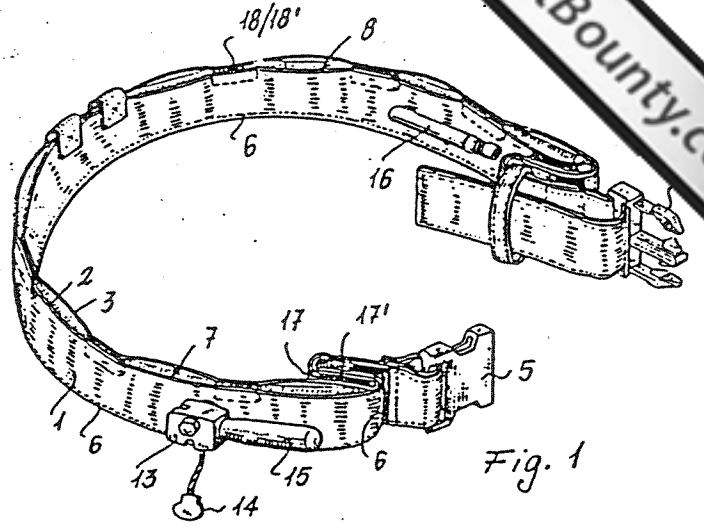


Fig. 1

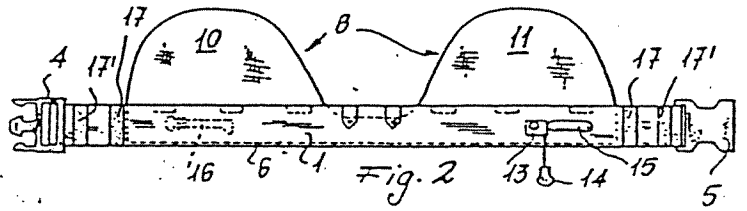


Fig. 2

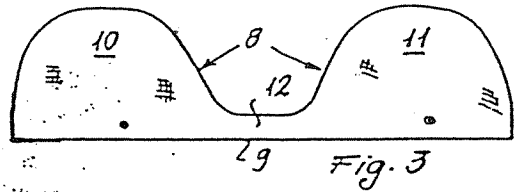


Fig. 3

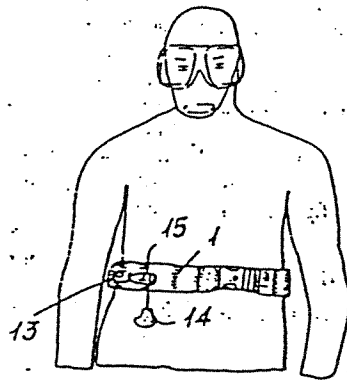


Fig. 4



Fig. 5

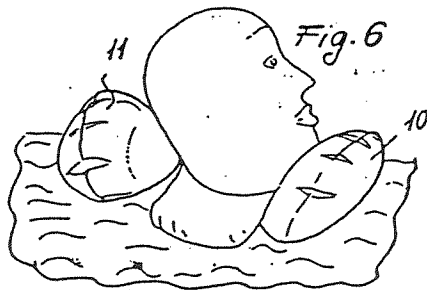


Fig. 6