



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
20.03.2013 Bulletin 2013/12

(51) Int Cl.:
A61G 7/10 (2006.01)

(21) Application number: **12006511.5**

(22) Date of filing: **17.09.2012**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

(72) Inventors:
• **Maindal, Peter**
8700 Horsens (DK)
• **Törnkvist, Kristin**
16834 Bromma (SE)

(30) Priority: **19.09.2011 DK 201100713**

(74) Representative: **Jacobsson, Peter**
Patentbyrå Y Wallengren AB
Box 116
331 21 Värnamo (SE)

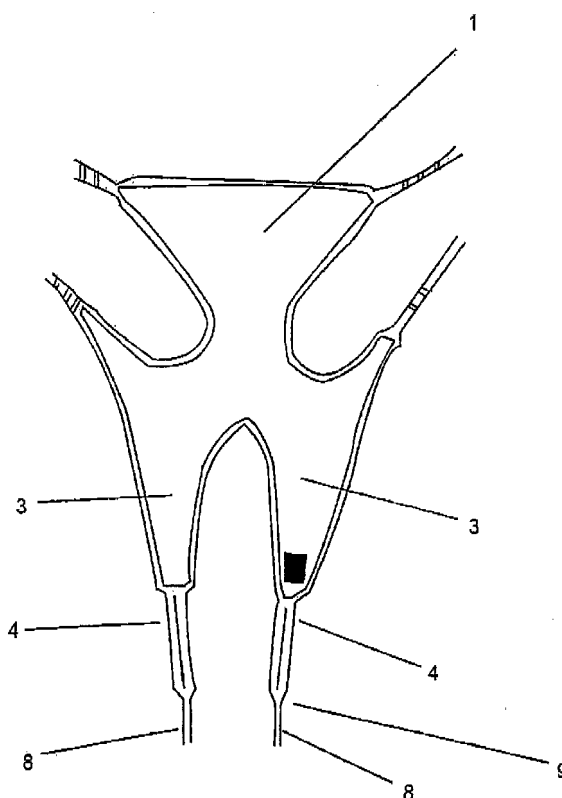
(71) Applicant: **ETAC AB**
164 51 Kista (SE)

(54) **Gentle sling for a hoist**

(57) A sling fabric, which is intended to lift and transfer patients/handicapped or temporarily immobile persons to and from sitting positions, includes lifting straps

(4), leg straps (3) and a back piece. On at least one of the straps (3) there is at least one pocket (9) for insertion of a hand of a caregiver for positioning of the strap (3),

Fig 1



Description

TECHNICAL FIELD

[0001] The present invention relates to the type of sling which is used when invalided/handicapped or temporarily immobile people are to be moved from A to B. The energy transfer proper most generally takes place with the aid of a hoist.

BACKGROUND ART

[0002] A classical complaint in these hoists is the discomfort which occurs on lifting, where a patient is subjected to the sling cutting or chafing into the heels or on the rear and inside of the thigh.

[0003] The present invention constitutes an attempt to design a sling which imparts increased comfort to the patient and in general attempts to obviate this discomfort.

[0004] Today, there are two methods of fixing lifting straps or slings.

a) The lifting straps are a direct extension of the edge band which runs around the entire sling. This applies both to leg straps and to lifting straps which lift about the back of the patient.

b) The lifting straps are sewn in place direct on the sling material proper - with a very narrow fixing/anchoring region. As regards fixing to the leg straps, which takes place in a combination with the leg strap/the sling material/the padding is spiculated and that the lifting strap is thereafter fixed direct in the tip; either on one side or on both sides of the sling material.

[0005] As regards the lifting straps at the back, there are on these slings one or two "legs" which are sawn directly on the sling material.

[0006] When the above-mentioned method is employed, there is a tendency in particular in the leg straps that pressure occurs about the heels and the rear and inside of the thigh. This naturally entails discomfort for the user of the sling. This is particularly manifest in slings in which lifting takes place in the edge band, but also slings with solutions b have this element inherent in them.

[0007] There are numerous inventions where attempts have been made on the part of the inventor to arrive at solutions to these problems.

Background art

[0008] EP 1609450 - the discomfort and the above-mentioned drawbacks are obviated in that the sling is rendered inflatable in which event the sling becomes softer and gentler to sit in.

[0009] Nevertheless, the sharp edges cannot be avoided and the sling proper is considerably more complicated

and more expensive than standard types to design. There must be constructed chambers for pumping air into, which is a major disadvantage. Each time the sling is to be employed, it must also be remembered that air must be pumped in - an extra working phase which lengthens the process in time and makes it more circumstantial.

[0010] UK 2338222 is also designed with reference to an improvement of the comfort for the patient - but in this instance, is rather related to support to the patient's head.

[0011] In GB2320486 lifting straps are secured to the sling in such a manner that the lifting force is distributed in the sling material and not along the edges of the sling. The result is a sling which is allegedly more comfortable to the patient.

Novel invention

[0012] In the present invention, the focus is in the first instance on the method by means of which the lifting straps are secured to the leg straps.

[0013] In the following (the remainder of the text) objects are described in the form of units which as a point of departure are standard object, but which may vary depending upon the remaining objects of the lift.

[0014] The method is based on the following:

a. The leg straps/lift material continues with a wide extent all the way out to the end. This ensures the greatest possible supporting area of the leg during movement.

b. The securing/anchorage of the lifting strap to the sling material should not be in contact with an edge band or the like. Thus, a pull in the lifting strap does not affect edge bands or the like.

c. The fixing/anchorage on the sling material proper is very wide and constructed from two layers:

i. Layer 1 which is a powerful polyester or nylon of the same material as in the lifting strap proper is stitched on as an anchorage. This anchorage has a specific extent,

ii. The lifting straps are approx. 40-50 mm wide and are now secured to the sling material via the previously mentioned anchorage. Thus, the lifting straps are sewn above the anchorage.

d. Where the lifting straps have their full width of substantially 40-50 mm down at the leg strap proper, the lifting strap is folded approx 25-35 cm from the anchorage proper on the sling material such that it will only be ½ width, and thereafter there is created a suspension means in order to ensure adjustment possibilities and adaptation to the individual user.

[0015] In this method, there will be achieved an extremely wide and large area of the leg straps which together transfer the forces from the lifting straps to the sling material proper. The effect of this will be that the forces are transferred to the entire extent of the sling material and the supporting surface will thereby become substantially larger than prior art solutions.

[0016] The anchorage is secured consistently throughout the entire fixing area and not only in the outer sides, but symmetrically with millimetre distance in the entire area.

[0017] This circumstance is of major importance for the loading zone of the energy transfer.

[0018] A larger supporting surface entails a plurality of consequences:

a) The user of the sling will experience a considerably greater degree of comfort, since the leg straps will not chafe or cut into the heels or the rear and inner side of the thigh.

b) As a result of the larger supporting surface, there will be a considerably lesser effect on the blood circulation to and from the lower extremities, which also counteracts numbness and also the risk of contusion injuries on exposed tissue structures.

[0019] The above-mentioned actions entail further obvious new features, which increase the practical use of the sling.

[0020] A major part of the work surrounding movement of persons relates to the work involved in using/applying the sling. This manifests itself in both a recumbent and sitting position.

[0021] In the recumbent position, use is made of a technique where the sling is rolled onto the person.

[0022] In the sitting position, the sling is applied in two stages. One stage in which the back portion of the sling is pushed down along the back of the patient. Thereafter, there follows a stage where it is ensured that the cut between leg straps and back is correctly positioned, followed by the leg straps being passed under the legs of the patient. The work involved in passing the leg straps under the legs of the patient is on many occasions heavy and circumstantial. This is due to the fact that most patients which are to be moved via a sling do not have any force in their own legs and as a result are themselves unable to lift them - as a result it will be more difficult to move the leg straps under the leg in a manner which, on the one hand, is expedient both in terms of time and ergonomics for the service personnel and at the same time is both dignified and comfortable for the patient. On a number of occasions, it often occurs that special inputs are required to lift the patient's legs and as a result facilitate application of the leg straps.

[0023] There are different working techniques today which attempt to address the problem, but there are still no satisfactory solutions.

[0024] For the vast majority of prior art existing slings, there is a pocket on the back of the sling. A pocket which is used when the sling is applied in the sitting position. The ideas behind this principle are transferred to the leg straps.

[0025] In the present invention, there is, at the end of the leg strap in the same area in which the anchor plus lifting straps are mounted, a pouch or pocket made of the same material as the sling proper.

[0026] The pocket covers exactly the anchorage proper and is approx. 10 - 15 cm deep or a depth covering the fixing area optimally.

[0027] In such instance, there is yet a further reinforcing layer on top of the already existing layer and hereby the design and construction of the anchorage are used optimally.

[0028] On application of the leg strap, the care provider places his hand into this pocket and with the flat of the hand presses down the substrate and simultaneously pushes the hand in under the thigh of the patient. The smooth exterior side of the pocket will reduce friction against the substrate and the smooth fabric of the leg strap proper reduces the friction against the patient's thigh.

[0029] The effect of this solution consists primarily of two things:

a. The care personnel achieve much better control in application of the leg straps. By being able to lead a stretched palm under the patient's thighs, friction is reduced and the forces required to perform this work. In the vast majority of cases this solution is so effective that there is no need for special measures to lift the patient's leg before the leg strap can be applied. In other words, the pocket leads to better working ergonomics for the care providing personnel, since with this method, less force is required to apply the sling. As a bonus to this, greater precision in work is achieved.

b. The patient perceives it as a significant simplification of the process concerning application of the sling and not least significantly less discomfort during the process. This implies taken as a whole a higher degree of dignity for the patient.

List of the accompanying Drawings

[0030]

- Fig. 1 sling spread out
- Fig. 2 edge band
- Fig. 3 leg straps and lifting straps
- Fig. 4 leg straps and lifting straps in closer detail
- Fig. 5 anchorage area of both lifting straps and pocket
- Fig. 6 pocket
- Fig. 7 using the pocket as demonstrated

Fig. 8 the same illustration - in a later stage
Figs. 9a-f different embodiments of a leg strap

List of reference numerals

[0031]

1. Sling
2. Edge band
3. Leg straps
4. Lifting straps
5. Fitting with anchorage
6. Fixing area to lifting straps
7. Same for pocket
8. Suspension device for lifting straps
9. Pocket
10. Reinforcement band

Description of embodiments

[0032]

Fig. 1 shows the sling (1) in its entirety and where the lifting straps (4) are illustrated in pairwise composition as well as a substantial width of the leg straps (3) throughout their entire length (9).

Fig. 2 illustrates the edge bands (2) in close-up image.

Fig. 3 here, the lifting straps (4) are shown pairwise and with the transition to the suspension device (8). Finally, there is shown the fixing area (6, 7) on the straps (3) respectively for the lifting straps (4), but also to the pockets.

Fig. 4, the seams and the anchorage of the pairwise lifting straps (4) are clearly apparent from this figure.

Fig. 5 shows in greater detail the fixing area with the anchorage. The dimensions of the fixing area illustrate at the same time that, because of its size, in a load situation, there will be provided a uniform tension in the body of the sling (1) instead of in the edge bands (2) and it is similarly illustrated that it is in the whole of the fixing area that the anchorage has been established.

Fig. 6, here the pocket on the one leg strap is seen.

Fig. 7 illustrates the process of applying the sling to the patient and here in concrete terms how to use the pocket (9) on the leg strap (3) for applying in a simple manner the same under the patient's thighs.

Fig. 8 shows the same situation but one step further in the process.

[0033] In fig. 9, a number of alternative embodiments are shown which have the main idea of a pocket (9) on a strap (3) in common. The outside of the pocket (9) has a smooth surface so that the friction will be low against other surfaces, such as the clothes or the skin of the patient or the material of a seat whereon the patient is sitting.

[0034] The hand in the pocket (9) will make it possible for the caregiver to make sure that the patient is not subjected to discomforts from the strap (3) while it is moved into the correct position, since the hand may apply a pressing force to the surface next to the patient in order to ease the passage of the strap (3). Depending on the design of the sling (1) and the position of the strap (3) on the sling (1), the pocket (9) may be constructed in various ways. One characteristic which is found in most pockets (9) is that there is at least one open side edge, so that insertion of a hand will be possible. Also there is, in most cases, at least one closed side edge, for providing stability to the construction and making sure that the pocket (9) is attached to the strap (3).

[0035] The different embodiments accommodate for the different possibilities of use, and make sure that the sling (1) will be easy to use for the caregiver and comfortable for the patient.

[0036] In fig. 9a, the pocket (9) is open towards its top, as seen in the figure. The hand is inserted into the pocket (9) in the direction of the arrow. The sides of the pocket (9) are secured, e. g. by sewing, under the edge band (2) on each respective side of the pocket.

[0037] In fig. 9b, the pocket (9) is open on one side, next to the edge and the edge band (2) of the strap (3). The hand may be inserted into the pocket (9) from the side.

[0038] Fig. 9c shows an embodiment where two pockets (9) are arranged on the strap (3), one on either side thereof. Each pocket (9) has an opening on one side thereof, and a hand may be inserted into either of the pockets (9), depending on which pocket (9) is the most convenient to use at a particular point in time. This embodiment also makes it easier to place the strap (3) independently of on which side of the patient the caregiver is standing, whether the caregiver is right-handed or left-handed etc.

[0039] The embodiment in fig. 9d also provides a similar independence of the position of the caregiver in relation to the patient, and of the right-handedness or left-handedness of the caregiver. In this embodiment the pocket (9) has openings from two opposite edges, close to the edge bands (2), on the same side of the strap (3). The openings may be used as alternatives or simultaneously.

[0040] In fig. 9e, there are two pockets (9) with their respective openings in transversal directions. Diagonally across the strap (3), there is a reinforcement band (10) extending from one edge band (2) to the other. The reinforcement band (10) covers a seam, which separates the two pockets (9) from one another. As an alternative,

there are two openings into one single pocket, and the reinforcement band is attached to the outer surface of that pocket (9).

[0041] Fig. 9f discloses an embodiment where there are three openings, from three different directions. There could either be one single pocket with three openings or two or more pockets arranged in layers on one side of the strap (3). A reinforcement band (10) is arranged along at least one of the edges of one or more of the pockets (9).

[0042] There is also the possibility (not shown in figure 9f) of arranging one or two of the pockets on the other side of the strap (3). The pockets (9) need not be completely overlapping, and could, in some embodiments be arranged in such positions that they are not overlapping at all.

[0043] In the embodiment in fig. 9g, a reinforcement band (10) is arranged along the edge of a pocket (9) which is similar to the pocket according to fig. 9a. It should be noted that the ends of the reinforcement band (10) are covered by the edge bands (2).

[0044] Fig. 9h discloses an embodiment where a pocket (9) has two openings, which are both arranged at an angle to the longitudinal direction of the strap (3). This will ensure the independence of the position of the caregiver in relation to the patient, and of the right-handedness or left-handedness of the caregiver, as described above. There is also a reinforcement band (10), extending in the longitudinal direction of the strap (3), on the outside of the pocket (9).

[0045] The general arrangement of the pocket in the embodiment according to fig. 9i corresponds to that of the embodiments according to the embodiments according to fig. 9a and 9g. However, the material of the strap (3) and of the pocket (9) is such that it has been possible to dispense with the edge band (2).

[0046] Finally in fig 9j, the material of the pocket (9) is divided into an upper and a lower part as seen in the drawing. The division or open part of the pocket (9) could be more or less extensive, as long as the function of a low friction against other surfaces is maintained and the strap (3) is easily directed with the aid of the hand.

[0047] Further embodiments that are not shown in the drawings include various combinations of the embodiments explicitly shown in the drawings. Also, an embodiment which includes a pocket which is attached to the strap (3) only at its corners, but with openings along all of its side edges is also included in the invention, as it serves the same purpose and is the result of the same inventive idea as the embodiments described above.

pocket (9) for insertion of a hand of a caregiver for positioning of the strap (3).

2. Sling fabric according to claim 1, **characterised in that** the outer surface of the pocket (9) is smooth for providing a low friction against other surfaces.
3. Sling fabric according to claim 1 or 2, **characterised in that** the pocket (9) has at least one open side edge.
4. Sling fabric according to any one of claims 1 to 3, **characterised in that** the pocket (9) has at least one side edge which is attached to the strap (3).
5. Sling fabric according to any one of claims 1 to 4, **characterised in that** the pocket (9) has at least one reinforcement band (10).
6. Sling fabric according to any one of claims 1 to 5, **characterised in that** two or more pockets (9) are arranged on either side of the strap (3).
7. Sling fabric according to any one of claims 1 to 6, **characterised in that** two or more pockets (9) are arranged in layers.
8. Sling fabric according to any one of claims 1 to 7, **characterised in that** two or more pockets (9) are overlapping.

Claims

1. Sling fabric intended to lift and transfer patients/ handicapped or temporarily immobile persons to and from sitting positions, including lifting straps (4), leg straps (3) and a back piece **characterised in that** on at least one of the straps (3) there is at least one

Fig 1

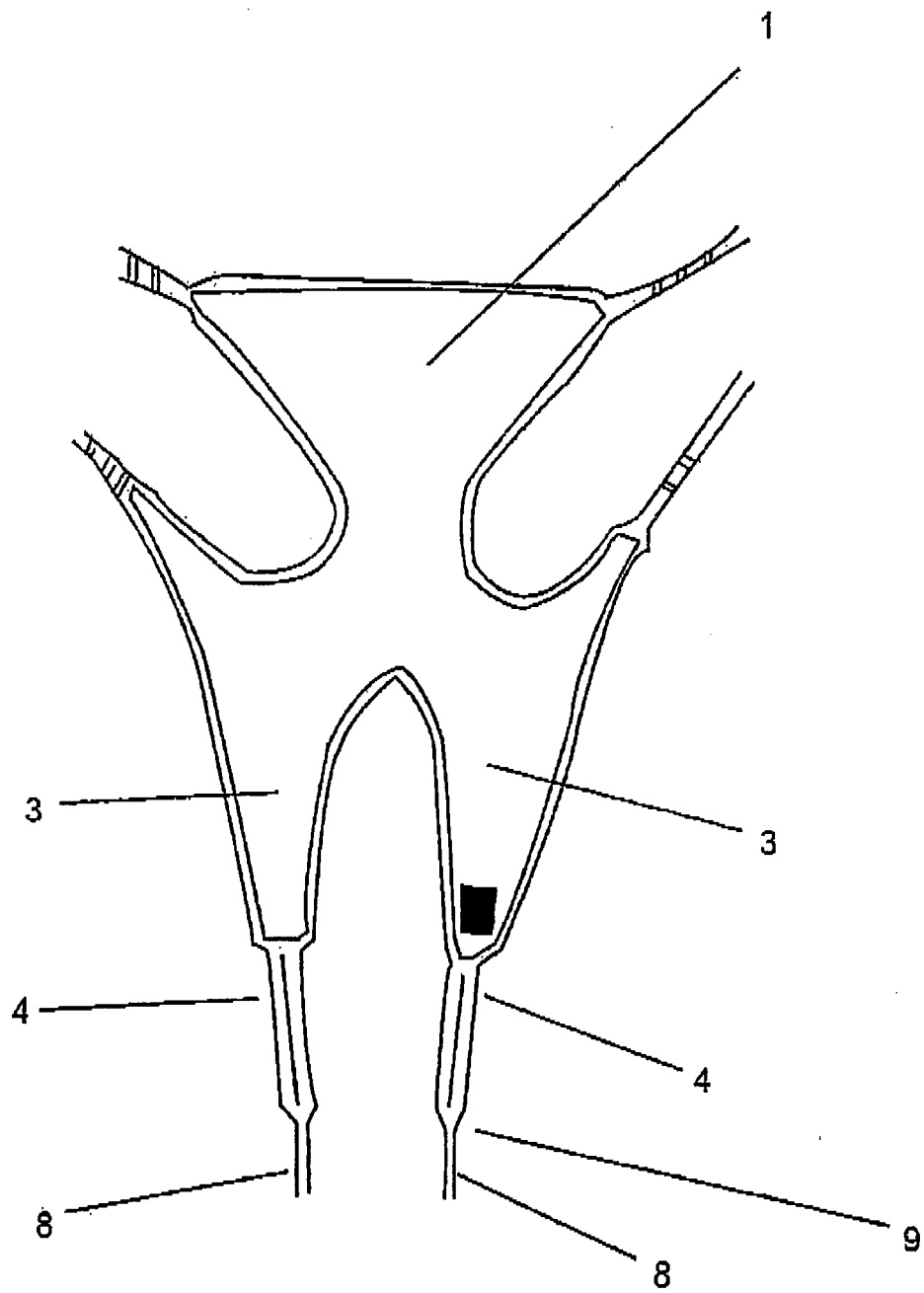


Fig 2

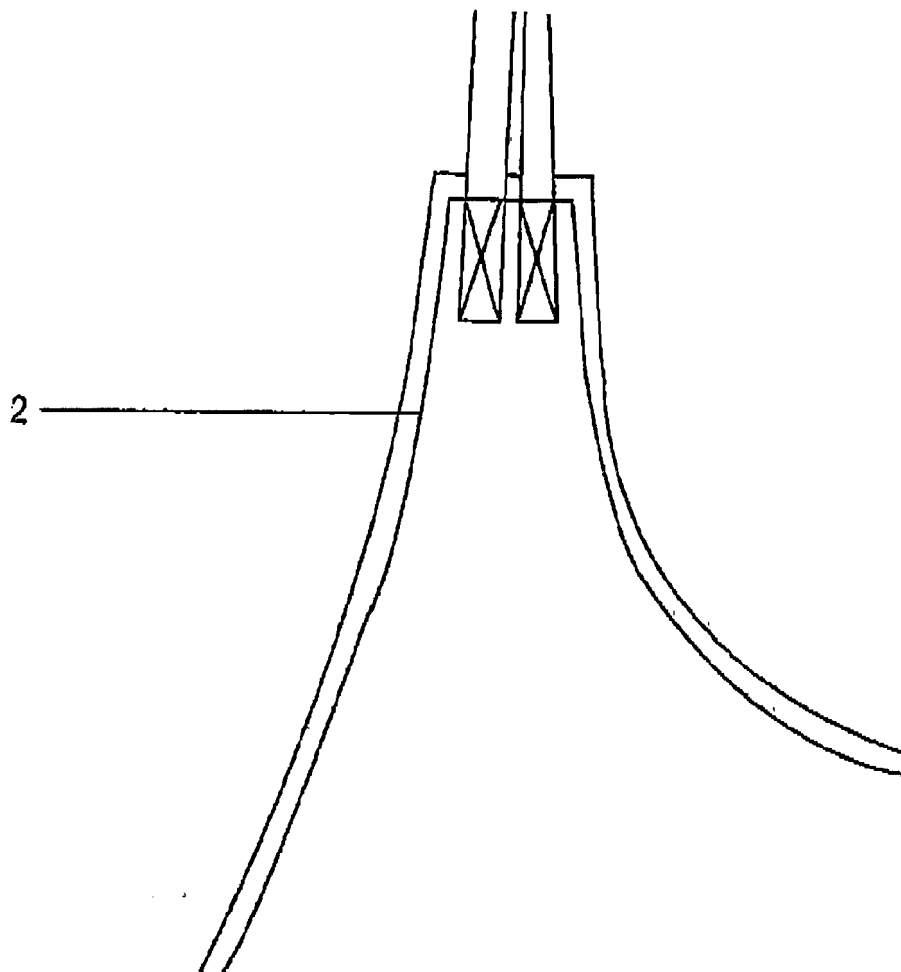


Fig 3

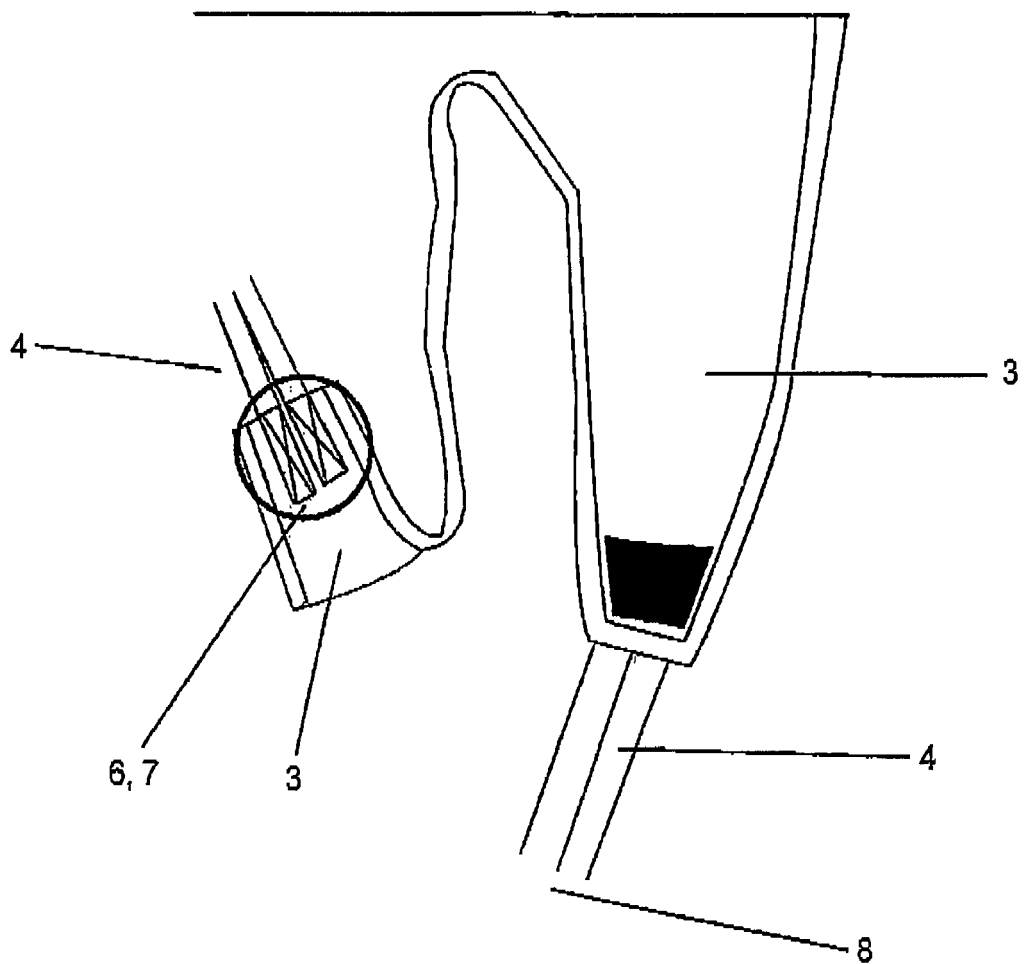


Fig 4

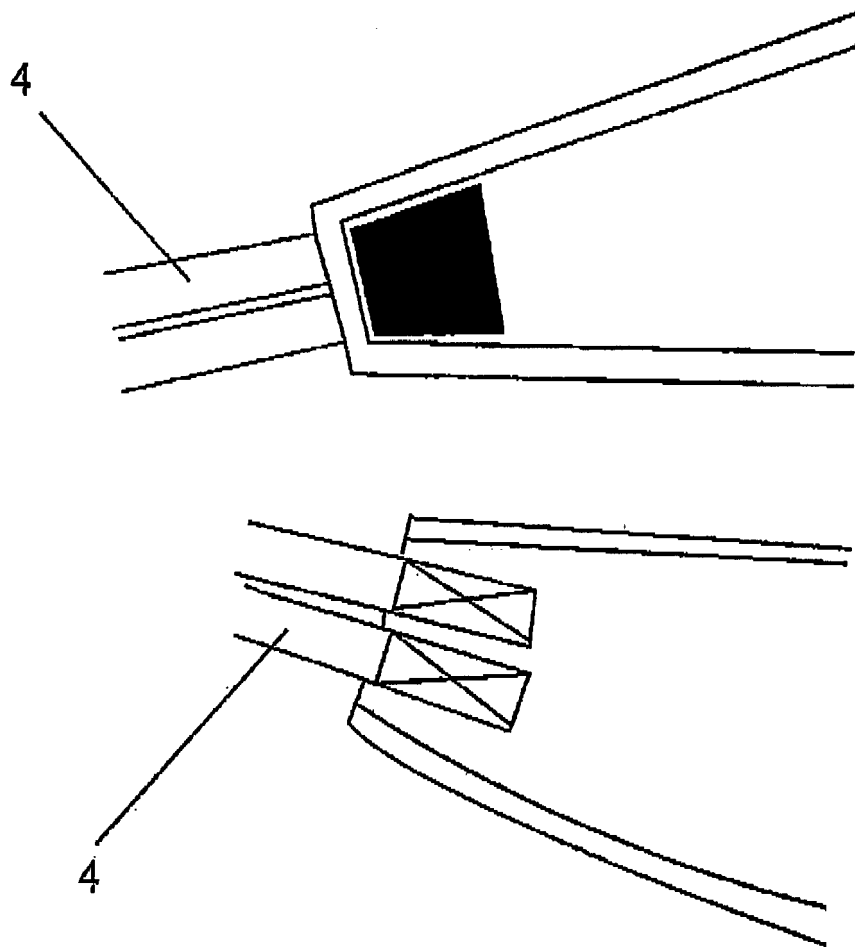


Fig 5

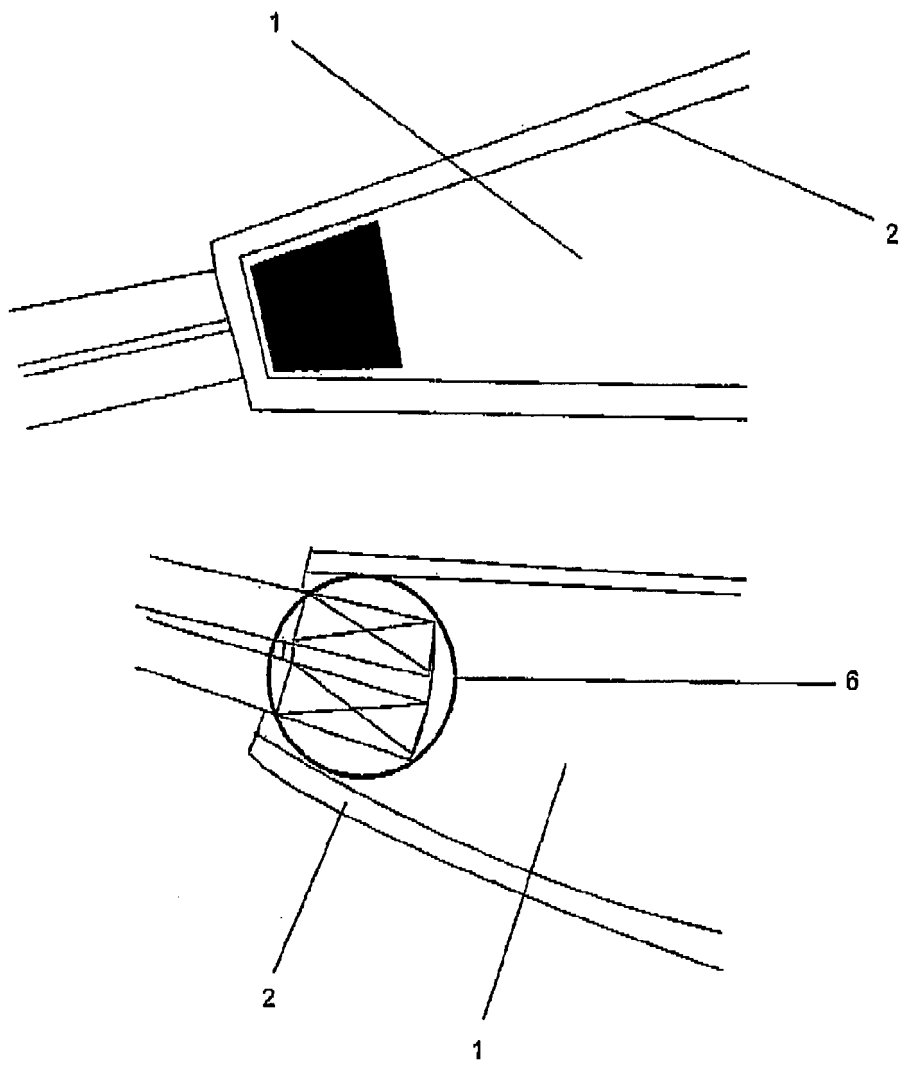


Fig 6

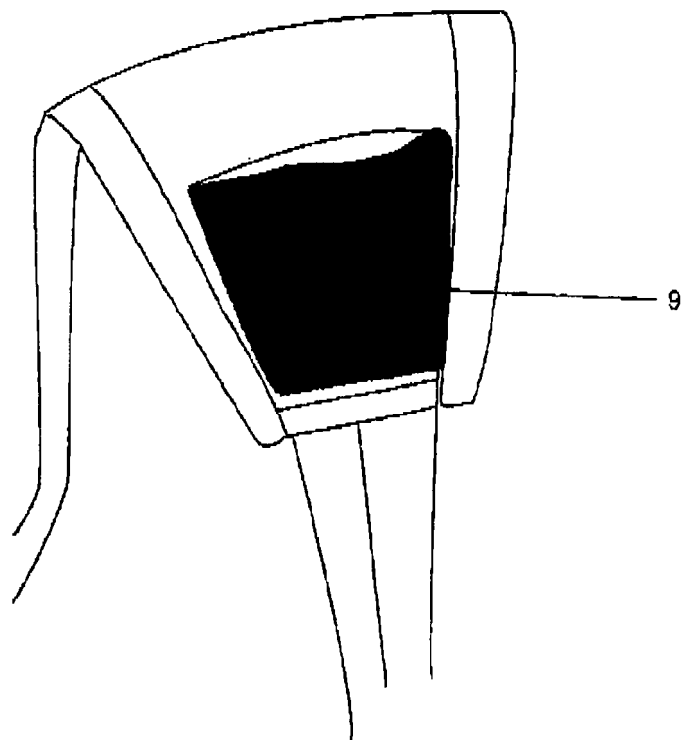


Fig 7

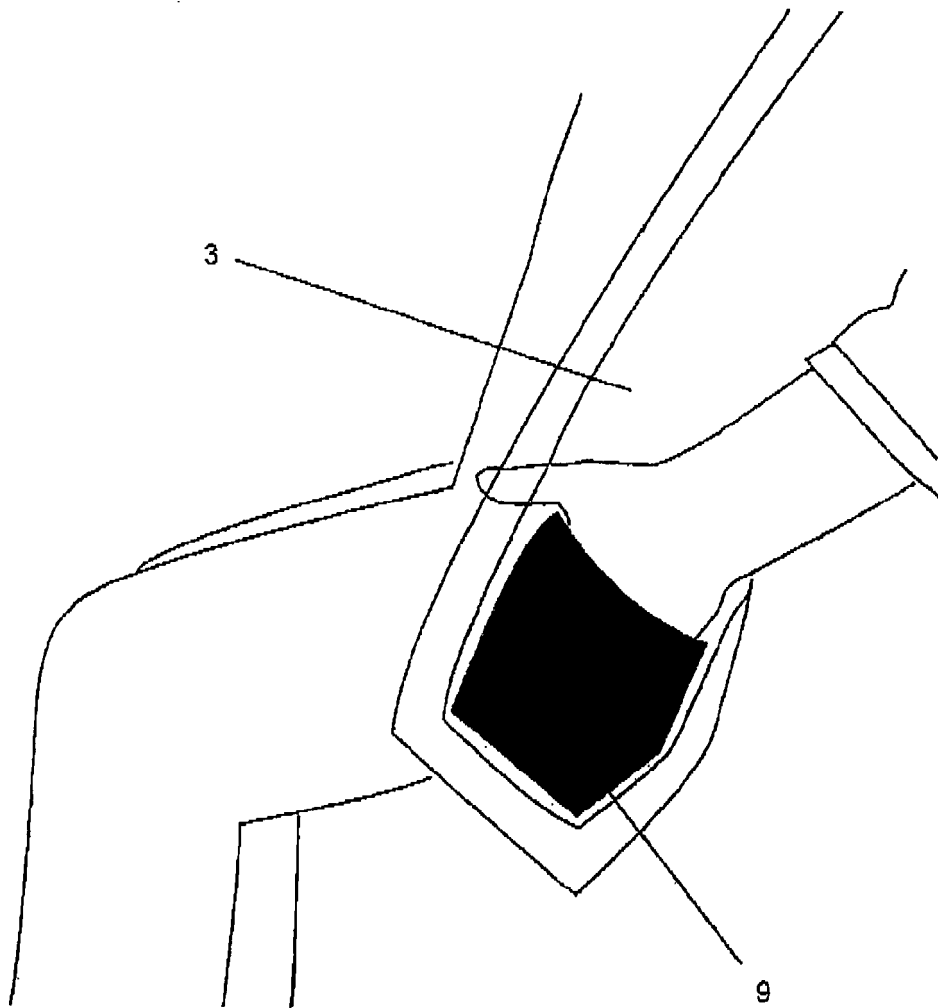
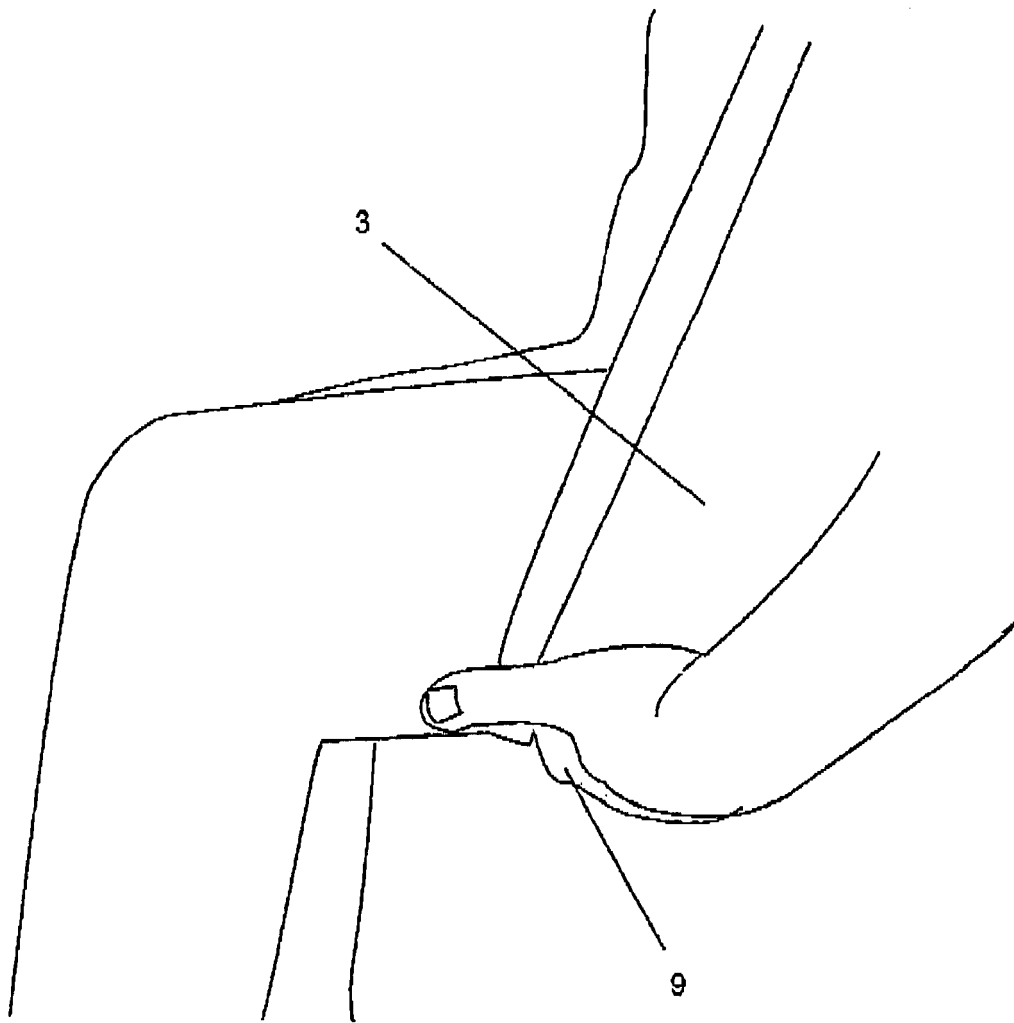
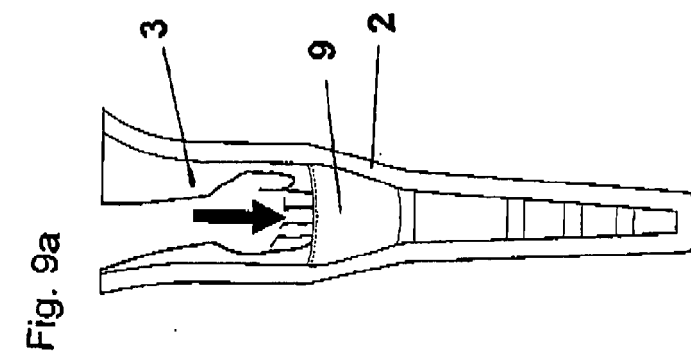
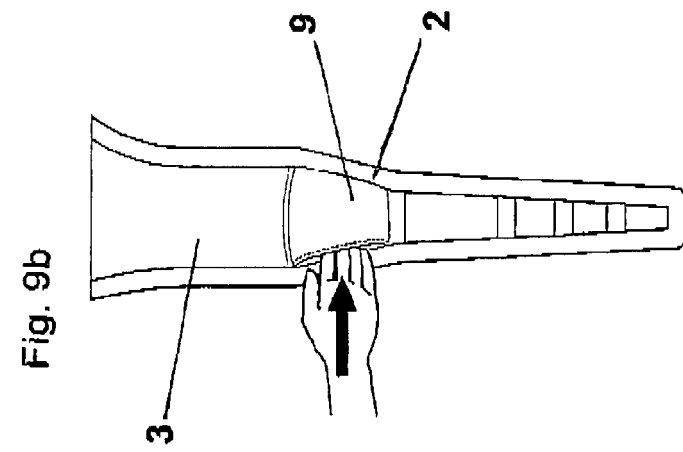
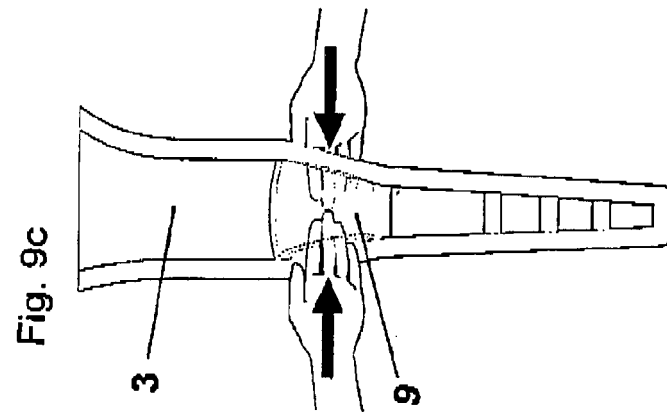


Fig 8





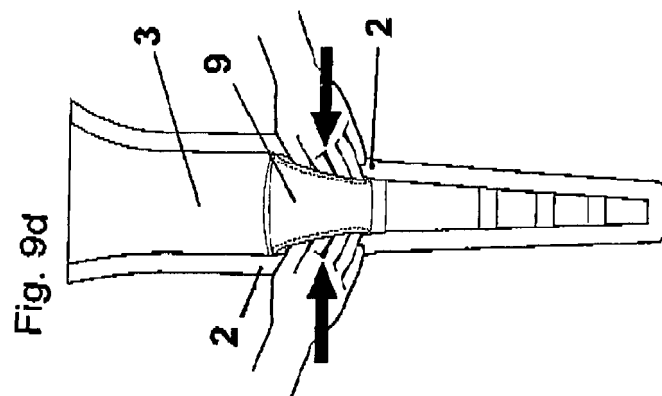
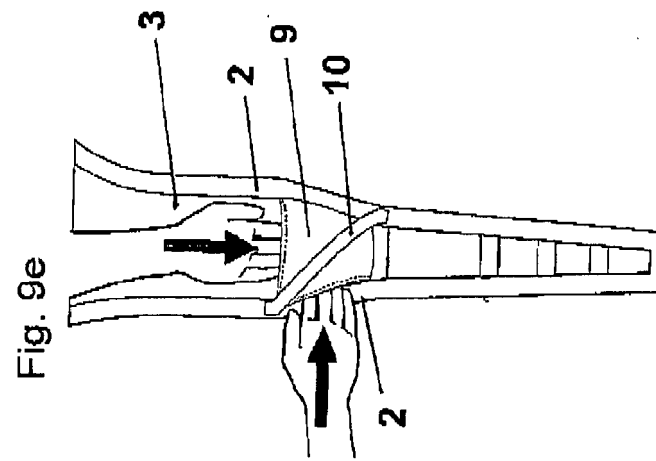
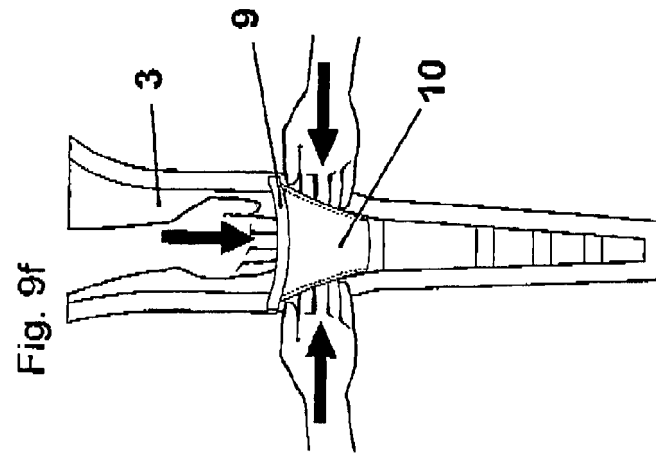


Fig. 9g

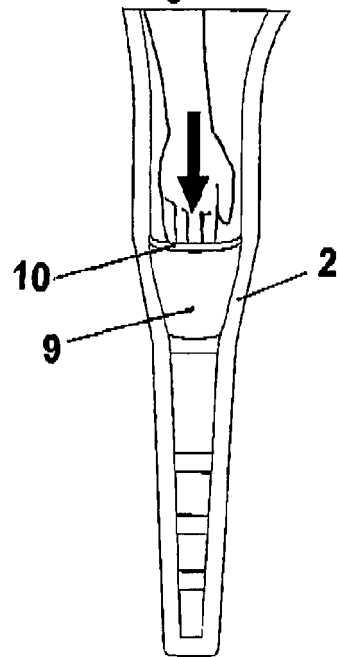


Fig. 9h

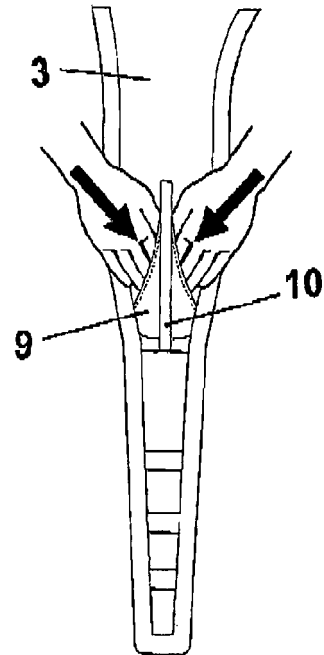


Fig. 9i

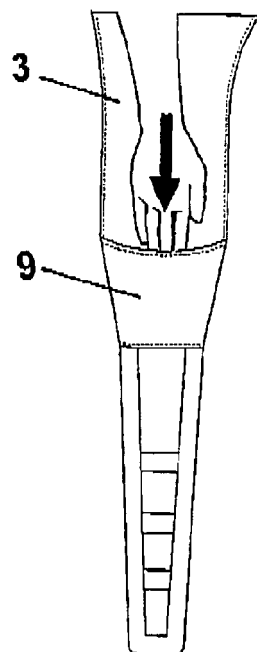
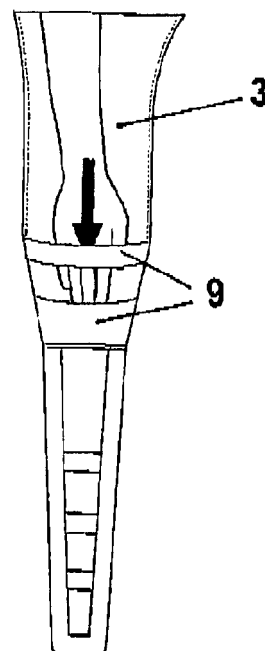


Fig. 9j



REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- EP 1609450 A [0008]
- GB 2338222 A [0010]
- GB 2320486 A [0011]