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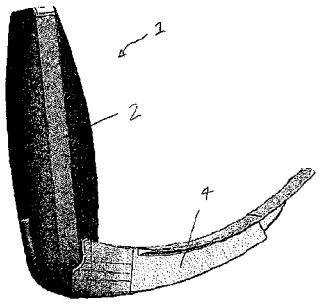

Figure 1C

(57) Abstract: A laryngoscope comprising a handle, a blade holding element, a detachable blade, means for viewing the laryngeal inlet of a patient and means for adjusting the viewing field. The means for adjusting the viewing field may comprise a light refracting means. Alternatively, in embodiments in which the viewing means comprises at least two fixed cameras elements directed to at least two different viewing fields, the means for adjusting the viewing field may comprise means for switching from one camera to the other or, in embodiments in which the viewing means comprises a movable camera element, the means for adjusting the viewing field may comprise mechanical or electronic means for controlling the movement of the camera. A method for viewing the laryngeal inlet of a patient using a laryngoscope comprising the step of adjusting the viewing field is also covered.

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LARYNGOSCOPE

This application relates to a laryngoscope and more particularly to a video laryngoscope.

Whereas a conventional laryngoscope is used by a physician to visualise the path to the trachea by manipulating the patient's anatomy to establish a direct line of sight, a video laryngoscope provides a view of the glottis and trachea without the need for such manipulation, which is clearly advantageous.

In recent times video laryngoscopes have also been provided that have removable, disposable blades, to remove the need for sterilisation.

A laryngoscope is a device which is used by clinicians during tracheal intubation and that assists with intubation by allowing the clinician to visualise the path of the endotracheal tube as it passes through the glottis towards the trachea. In its most recent form a laryngoscope comprises a handle and a blade and often includes a light source. Some laryngoscopes are also provided with viewing devices such as fibre optics and cameras. These are called video laryngoscopes.

Most intubations are straightforward and clinicians use a laryngoscope with a straight or curved blade which is positioned into the patient's airway. However, some patients are known to be difficult to intubate, especially if there are anatomical abnormalities (e.g. if the larynx lies particularly anteriorly) or if there are injuries. Intubation of these patients is more successful using a blade with a different shape, such as the "difficult blade" described in more

detail below. A blade for use in difficult intubations preferably has a curved portion that smoothly follows the anatomical shape of the patient's airways, a ventrally displaced distal extension to allow a better view of the laryngeal inlet and a paddle to guide the endotracheal tube towards the laryngeal inlet.

There is currently no universal blade that can be used in all cases and a number of different blades may be desired and beneficial so that the clinician can visualise the laryngeal inlet with a choice of blade shapes depending upon clinical requirements and personal expertise and preference. Since existing video laryngoscopes are necessarily used with one compatible blade shape, the user will need to use an entirely different laryngoscope depending on the situation. For example, a clinician could insert a video laryngoscope with a standard curved blade into a patient and upon insertion realise that abnormalities are present which require a modified blade. He or she would then need a second video laryngoscope with a modified blade to visualise the laryngeal inlet, thereby adding to the cost of the equipment required to perform efficiently. The blades are often disposable and relatively cheap, whereas the handle comprising the viewing means is generally expensive. There is therefore a need for a laryngoscope which may be used with different blade shapes.

It is an object of this invention to seek to mitigate problems such as those described above.

According to a first aspect of the invention, there is provided a laryngoscope comprising a handle, a blade holding element, a detachable blade and means for viewing the laryngeal inlet of a patient, the laryngoscope further comprising means for adjusting the viewing field.

Preferably, the laryngoscope is configured to be usable with at least two different detachable blades, including for example straight blades, curved blades or blades specifically designed for difficult intubations.

The blade may comprise a sleeve portion that completely or partially surrounds the blade holding element and a distal extension which is preferably integrally moulded with the sleeve portion. Such integrally moulded blades are cheaper to produce, more robust and less prone to contamination if reused.

The detachable blade may further comprise means for guiding the endotracheal tube towards the tip of the distal extension. This is particularly useful where the clinician faces a difficult and complex intubation situation.

In a preferred embodiment, the viewing means comprises at least one fixed camera located at the distal end of the blade holding element. Preferably, means for adjusting the viewing field comprises a light refracting means, such as a prism or a wedge prism.

In another preferred embodiment, the viewing means comprises at least two fixed cameras elements directed to at least two different viewing fields. Preferably, the laryngoscope further comprises means for switching from one camera to the other so that for example the first camera is used for when the laryngoscope is fitted with a standard blade and the second camera when a difficult blade is used.

In yet another embodiment, the viewing means comprises a movable camera element. Preferably, the laryngoscope further comprises mechanical or electronic means for controlling the movement of the camera. For example, the distal end of the sleeve of the blade may comprise a window positioned such that, in use, the camera is positioned to visualise the laryngeal inlet of the patient.

According to a second aspect of the invention, there is provided a method for viewing the laryngeal inlet of a patient using a laryngoscope comprising a handle, a blade holding element, a detachable blade and means for viewing the laryngeal inlet of a patient, comprising the step of adjusting the viewing field.

The invention will be further described with reference to the drawings, in which:

Figure 1A to 1C show a laryngoscope according to the invention;

Figure 2A shows a standard curved blade;

Figure 2B shows a blade for difficult intubations;

Figure 3 shows part of a laryngoscope according to a first embodiment of the invention;

Figure 4a shows the laryngoscope of figure 3 fitted with a short standard curved blade;

Figure 4b shows a view obtained with the laryngoscope of figure 4a;

Figure 5a shows the laryngoscope of figure 3 fitted with a long standard curved blade;

Figure 5b shows a view obtained with the laryngoscope of figure 5a;

Figure 6a shows the laryngoscope of figure 3 fitted with a difficult blade;

Figure 6b shows a view obtained with the laryngoscope of figure 6a;

Figure 7 shows part of a laryngoscope according to a second embodiment of the invention;

Figure 8a shows the laryngoscope of figure 7 fitted with a short standard curved blade;

Figure 8b shows a view obtained with the laryngoscope of figure 8a;

Figure 9a shows the laryngoscope of figure 7 fitted with a long standard curved blade;

Figure 9b shows a view obtained with the laryngoscope of figure 9a;

Figure 10a shows the laryngoscope of figure 7 fitted with a difficult blade;

Figure 10b shows a view obtained with the laryngoscope of figure 10a;

Figure 11 shows part of a laryngoscope according to a third embodiment of the invention;

Figure 12a shows the laryngoscope of figure 11 fitted with a short standard curved blade;

Figure 12b shows a view obtained with the laryngoscope of figure 12a without a prism;

Figure 12c shows a view obtained with the laryngoscope of figure 12a with a prism;

Figure 13a shows the laryngoscope of figure 11 fitted with a short standard curved blade;

Figure 13b shows a view obtained with the laryngoscope of figure 13a without a prism;

Figure 13c shows a view obtained with the laryngoscope of figure 13a with a prism;

Figure 14a shows the laryngoscope of figure 11 fitted with a short standard curved blade;

Figure 14b shows a view obtained with the laryngoscope of figure 14a without a prism;

Figure 14c shows a view obtained with the laryngoscope of figure 14a with a prism;

Figure 15 shows part of a laryngoscope according to a fourth embodiment of the invention;

Figure 16a shows the laryngoscope of figure 11 fitted with a short standard curved blade;

Figure 16b shows a view obtained with the laryngoscope of figure 16a without a prism;

Figure 16c shows a view obtained with the laryngoscope of figure 16a with a prism;

Figure 17a shows the laryngoscope of figure 11 fitted with a short standard curved blade;

Figure 17b shows a view obtained with the laryngoscope of figure 17a without a prism;

Figure 17c shows a view obtained with the laryngoscope of figure 17a with a prism;

Figure 18a shows the laryngoscope of figure 11 fitted with a short standard curved blade;

Figure 18b shows a view obtained with the laryngoscope of figure 18a without a prism;

Figure 18c shows a view obtained with the laryngoscope of figure 18a with a prism;

Figure 19 shows part of a laryngoscope according to a second embodiment of the invention;

Figure 20a shows the laryngoscope of figure 9 fitted with a short standard curved blade;

Figure 20b shows a view obtained with the laryngoscope of figure 20a;

Figure 21a shows the laryngoscope of figure 9 fitted with a long standard curved blade;

Figure 21b shows a view obtained with the laryngoscope of figure 20a;

Figure 22a shows the laryngoscope of figure 9 fitted with a difficult blade; and

Figure 22b shows a view obtained with the laryngoscope of figure 20a;

In this application, the terms "distal part" and "proximal part" are used relative to the medical professional, i.e. the "distal part" is used to describe the part of the device that is inserted first into the patient. The terms "dorsal" and "ventral" are used relative to the patient, i.e. the "dorsal" side is used to describe the side directed to the back of the patient and the "ventral" side is used to describe the side directed to the front of the patient.

With reference to figures 1A to 1C, the laryngoscope (1) comprises a handle (2) for holding and manoeuvring the laryngoscope, a blade holding element (3) that is pivotally attached to the handle (2) and a detachable blade (4) that is attached the blade holding element (3).

The handle (2) is preferably made of stainless steel for robustness, although other materials such as metals or plastics may be used. At the proximal end, the blade holding element (3) is pivotally connected to the heel of the handle (2). The blade (4) is preferably hollow so that it can be fitted onto the blade holding element by sliding as can be seen in figures 1A-1C

(described in more detail below). Preferably, the blade holding element (3) is elongated in shape and its outer contour corresponds substantially to the inner shape of the blade (4).

The blade (4) is preferably integrally constructed and is for example produced by injection moulding so that the cost of production is relatively affordable. The blade is preferably disposable to minimise or eliminate any risk of cross-contamination between patients. The blade may be made partially or completely with a transparent material in order to view the areas surrounding the laryngeal inlet.

The blade (4) may be straight (e.g. a Miller laryngoscope blade), curved (e.g. a Macintosh blade). Curved blades are generally preferred by clinicians because they are dimensioned to conform to the anatomical curve of the patient's throat. Figure 2A shows a standard curved Macintosh blade (4a) comprising a sleeve (5a) configured to surround, partially or completely, the blade holding element (3) and having a proximal end and a distal end. The distal end of the sleeve preferably comprises a transparent window (6a). The blade (4a) further comprises a distal extension (7a) generally following the curve of the sleeve (5a).

Figure 2B shows a blade (4b) with an enhanced longitudinal circumference. This type of blade (also referred to herein after as a "difficult blade") facilitates a view of the laryngeal inlet and is used for difficult and complex intubations.

The blade (4b) comprises a sleeve (5b) configured to surround, partially or completely, the blade holding element (3) and having a proximal end and a distal end. The distal end of the

sleeve preferably comprises a transparent window (6b). The blade (4b) further comprises a distal extension (7b) is displaced ventrally from the curve of the sleeve (5b).

The difficult blade preferably comprises a guiding means for guiding the endotracheal tube into the correct position in the patient's airway. In the blade (4b) shown in figure 2B, the guiding device comprises a paddle extending from the distal end of the sleeve (5b) and following the curve of the sleeve to direct the tube towards the tip of the distal extension (7b).

As mentioned above, the difficult blade (4b) is recommended for difficult and complex intubations and standard Macintosh blades (4a) are used in most straightforward intubations. The standard blades (a) have the advantages of being generally cheaper than the difficult blades (4b). In addition, the difficult blades (4b) can lead to laryngeal injury when unnecessarily used for a simple straightforward intubation case. There is therefore a need for both types of blade and the clinician will choose the most appropriate blade for the situation.

The laryngoscope (1) further comprises means for viewing the laryngeal inlet of a patient. Such means can comprise a display screen (not shown) to visualise the area captured, for example, by a camera. A detachable or fixed display screen may be connected at the proximal end of the handle (2) or a separate display screen may be provided. An advantage of having a detachable screen is that the equipment can be easily cleaned after use.

Preferably, the viewing means includes at least one camera element (9) which may be located at the distal end of the blade holding element (3) so as to be directed towards the distal end of

the blade (4). The image captured by the camera may be transferred to a display screen and/or other viewing means for example by means of fibre optic.

The laryngoscope (1) may also comprise a light source and/or any other visualisation means that enable external indirect visualisation of the laryngeal inlet. For example, a light source may be provided so that the distal tip of the blade is illuminated.

In operation, the laryngoscope (1) is inserted into the mouth of the patient. The blade (4) will push the tongue of the patient to the side of the oropharynx to create space through which the larynx and the epiglottis can be viewed. The blade (4) is manipulated to lift the epiglottis thereby exposing the laryngeal inlet.

An endotracheal tube can then be introduced and advanced past the vocal cords into the trachea. The endotracheal tube can be inserted together with the laryngoscope so that the tube-laryngoscope are inserted and positioned at the same time. Alternatively, the laryngoscope may be inserted first and the tube may be inserted after the laryngoscope is in the correct position. The user can visualise the distal end of the blade (4) for example on the display screen and manipulate the laryngoscope (1) accordingly. Once the tube is correctly positioned, the laryngoscope (1) is removed.

The main problem solved by the present invention is the adjustment of the viewing field so that the clinician has a clear view of the laryngeal inlet of the patient, with minimum distortion and maximum focus, regardless of the type of blade fitted onto the blade holding element. Preferably, the viewing field covers at least a 30° viewing angle below the tip of the

extension (7) for optimum view of the laryngeal inlet. This area cannot be clearly viewed for example when a prior art laryngoscope configured for use with a standard blade is used with a difficult blade, because the view is obstructed by the tracheal tube guiding means and/or because of the ventral displacement of the distal extension of the blade.

Embodiment 1

Figure 3 shows part of a laryngoscope according to a first embodiment of the invention, in which the outer contour of the blade holding element (3) corresponds substantially to the inner shape of the sleeves (5a, 5b) of the standard and difficult blades (4a, 4b) so that the blades can be used interchangeably with the same laryngoscope. The fixed camera element (9) is located at the distal end of the blade holding element (3).

In figures 4a and 5a, the blade holding element (3) is fitted with a short standard curved blade and with a long standard curved blade (4a), respectively. Line H-H passes between the centre of the lens of the camera (9) and the pivotal joint between the handle (2) and the blade holding element (3). The camera (9) is arranged so that the centre of the visual field captured by the camera is located at an angle α_1 ranging for example from 5° to 15° from line H-H in the plan defined by line H-H and the longitudinal axis of the handle (2). In figures 4a and 5a, the exemplary angle is 12.75° and there is minimum blade intrusion into the view frame.

The views captured by the camera (9) are shown in figures 4b and 5b. The views are clear and not distorted (as illustrated by the perfectly square grid). These are satisfactory views but

ideally the tip of the distal extension (7a) should be visible so that the view is precisely focused on the laryngeal inlet of the patient.

In figure 6a, the blade holding element (3) is fitted with a difficult blade (4b). The distal end of the sleeve (6b) comprises a wedge prism that redirects the optical pathway so that the tip of the extension (7b), and therefore the laryngeal inlet of the patient, is visible as shown in figure 6b. Preferably, the prism is chosen so that the centre of the visual field captured by the camera is located for example at an angle ranging from 20° to 40°. In figure 6b, the exemplary strength of the prism is 29° which provides an exemplary angle of 35.75° (corresponding to the original angle α_1 of 12.75° plus a ventral tilt β_1 of 23°). However, the view captured by the camera (9) is slightly distorted as can be seen by the compressed grid lines on figure 6b.

In this first embodiment, the laryngoscope can be used with interchangeable blades. When fitted with a standard curved blade, no prism is required since a satisfactory view is obtained using a strategic positioning of the camera. For difficult intubations, the clinician replaces the standard curved blade with a difficult blade fitted with a prism as described above to adjust the view so that a clear, non-distorted view of the laryngeal inlet is obtained.

Embodiment 2

Figure 7 shows part of a laryngoscope according to a second embodiment of the invention. The main difference with the laryngoscope of figure 3 lies in the position of the camera (9). The camera (9) is arranged so that the centre of the visual field captured by the camera is located at an angle α_2 ranging for example from 15° to 25° from line H-H in the plan defined

by line H-H and the longitudinal axis of the handle (2). The angle α_2 is greater than α_1 (for example 17°)

In figures 8a and 9a, the blade holding element (3) is fitted with a short standard curved blade and with a long standard curved blade (4a), respectively. The views captured by the camera (9) are shown in figures 8b and 9b and include the tip of the extension (7a). The views are clear and not distorted (as illustrated by the perfectly square grid). These are satisfactory views that, when positioned in the patient, precisely focus on the laryngeal inlet of the patient.

In figure 10a, the blade holding element (3) is fitted with a difficult blade (4b). The distal end of the sleeve (6b) comprises a wedge prism that redirects the optical pathway so that the tip of the extension (7b) is visible as shown in figure 10b. Preferably, the prism is chosen so that the centre of the visual field captured by the camera is located for example at an angle ranging from 30° to 45°. In figure 6b, the exemplary strength of the prism is 25° which provides an exemplary angle of 37° (corresponding to the original angle α_2 of 17° plus a ventral tilt β_2 of 20°). The view captured by the camera (9) is less distorted and clearer than that obtained with the stronger wedge prism of the first embodiment (see figure 6b).

Embodiment 3

Figure 11 shows part of a laryngoscope according to a third embodiment of the invention. The camera (9) is arranged so that the centre of the visual field captured by the camera is located at an angle α_3 ranging for example from 25° to 40° from line H-H in the plan defined by line

H-H and the longitudinal axis of the handle (2). The angle α_3 is greater than α_1 and α_2 (for example 32°).

In figures 12a and 13a, the blade holding element (3) is fitted with a short standard curved blade and with a long standard curved blade (4a), respectively. In addition, a wedge prism is fitted at the distal end of the sleeve (6a) to direct the viewing field towards the tip of the extension (7a).

Figures 12b and 13b show the views obtained using the blades of figures 12a and 13a and the re-positioning of the camera on its own (i.e. without a wedge prism). No distortion is observed and the view is clear. However, the extension (7a) intrudes into (approximately 1/3 of) the viewing field.

By contrast, when a wedge prism is fitted onto the blade (see figures 12c and 13c), the tip of the extension is visible but does not substantially intrude into the viewing field. A slight distortion is observed but the view is sufficiently clear to allow inspection of the patient's airway to efficiently insert a tracheal tube. In figures 12a and 13a, the exemplary strength of the prism is 20° which provides an exemplary angle of 18° corresponding to the original angle α_3 of 32° minus a dorsal tilt β_3 of 14°. In this case, the tilt β_3 is subtracted from the original angle α_3 because the wedge prism is positioned so that the view is re-adjusted dorsally and not ventrally (as in the previous embodiments).

In figure 14a, the blade holding element (3) is fitted with a difficult blade (4b). The exemplary strength of the prism is 20° which provides an exemplary angle of 46° corresponding to the

original angle α_3 of 32° due to the positioning of the camera, plus a ventral tilt β_3 of 14° due to the presence of the prism. A clear view with significantly reduced distortion is obtained as can be seen in figure 14c.

As a comparison, figure 14b shows a view obtained using the blade of figures 14a and the re-positioning of the camera on its own (i.e. without a wedge prism). No distortion is observed and the view is clear but the tip of the extension (7b) is not visible, i.e. the view is not precisely focused on the laryngeal inlet of the patient.

Embodiment 4

The laryngoscope of figure 15 is similar to that shown in figure 11. The difference is that the camera (9) is arranged so that the centre of the visual field captured by the camera is located at an angle α_4 of for example 27.5° from line H-H in the plan defined by line H-H and the longitudinal axis of the handle (2).

In figures 16a and 17a, the blade holding element (3) is fitted with a short standard curved blade and with a long standard curved blade (4a), respectively. The wedge prism is weaker than that used in embodiment 3, for example with a strength of 16° and the resulting angle is 18° corresponding to the original angle α_4 of 27.5° due to the positioning of the camera, minus a dorsal tilt β_4 of 9.5° due to the presence of the prism.

As can be seen on figures 16b and 17b, the extension (7a) intrudes into the viewing field when the blade (4a) is not fitted with a wedge prism, but the view is clear and non-distorted.

When the prism is fitted to the distal end of the sleeve (5a) of the blade (4a), then only the tip of the extension (7a) is visible, thereby indicating that a focused view of the laryngeal inlet can be obtained (see figures 16c and 17c). There is little distortion and the view is clear.

In figure 18a, the blade holding element (3) is fitted with a difficult blade (4b). The exemplary strength of the prism is 21.5° which provides an exemplary angle of 45° corresponding to the original angle α_4 of 27.5° due to the positioning of the camera, plus a ventral tilt β_4 of 17.5° due to the presence of the prism. A clear view with significantly reduced distortion is obtained as can be seen in figure 18c.

As a comparison, figure 18b shows a view obtained using the blade of figures 18a and the re-positioning of the camera on its own (i.e. without a wedge prism). No distortion is observed and the view is clear but the tip of the extension (7b) is not visible.

Embodiment 5

The distal end of the blade holding element (3) may be fitted with at least a first and a second camera (9). The first camera may be positioned so that a clear, non-distorted view of the laryngeal inlet is obtained when using a standard blade and the second camera may be positioned so that a clear, non-distorted view of the laryngeal inlet is obtained when using a difficult blade. A laryngoscope fitted with such a viewing means enables the clinician to use one laryngoscope for at least standard and difficult blades, thereby limiting expenses. In addition, this type of laryngoscope may be used with blades which do not require a prism or

any other means of adjusting the viewing field, since the viewing field is already adjusted using a multi-camera system.

The laryngoscope (1) may further comprise means (for example electronic means) for switching from one camera to the other so that the clinician may select to use the first and/or the second camera depending on the view required and the type of blade fitted onto the blade holding element.

Embodiment 6

The inventors further developed the laryngoscope of Embodiment 5 by replacing the multi-camera system with a single movable or "tiltable" camera (9) fitted at the distal end of the blade holding element (3). For example, the camera may be encased in a low friction housing, it may be fitted with a mechanical or electronic means of tilting the camera so that the viewing field is focused on the laryngeal inlet of the patient. This type of laryngoscope may be used with blades which do not require any prism or any other means of adjusting the viewing field.

The laryngoscope (1) may further comprise means for positioning the camera in the desired position so that a clear, non-distorted view of the laryngeal inlet. For example, the laryngoscope may comprise mechanical or electronic means for remotely changing the position of the camera. Alternatively, the blades may be such that the position of the camera is automatically adjusted when the blade is fitted onto the blade holding element. For example, the distal end (6) of the sleeve (5) may be built or moulded at an angle so that upon fitting the

blade onto the blade holding element, the distal end or window (6) pushes the camera into a position suitable for viewing the tip of the extension (7) of the blade in a clear and non-distorted manner. Such constructions are shown in figures 20a, 21a and 22a and the corresponding views are shown in figures 20b, 21b and 22b.

Where the blade comprises a wedge prism, the prism may be fitted onto the blade by any suitable means, including for example screws and/or glue. Preferably, the prism is integrally moulded at the distal end of the sleeve. An integrally mounted prism has the advantage of being less expensive, more robust and less prone to contamination.

It is believed that currently more than 95% of all intubations can be carried out using a standard blade, which means that clinicians need to buy a laryngoscope, specifically designed for use with a difficult blade, for the remaining 5% (or less) of the intubations. The laryngoscope described above enables clinicians to minimise expenses because only one universal laryngoscope is required for use with physically and functionally dissimilar blades. In addition, the different types of blade may be used interchangeably without substantially compromising the clarity of the view of the patient's laryngeal inlet.

CLAIMS

1. A laryngoscope comprising a handle, a blade holding element, a detachable blade and means for viewing the laryngeal inlet of a patient characterised in that the laryngoscope further comprises means for adjusting the viewing field.

2. The laryngoscope according to claim 1, wherein the laryngoscope is configured to be usable with at least two different detachable blades.

3. The laryngoscope according to claim 1, wherein the blade comprises a sleeve portion and a distal extension.

4. The laryngoscope according to claim 3, wherein the detachable blade further comprises means for guiding the endotracheal tube towards the tip of the distal extension.

5. The laryngoscope according to any preceding claim, wherein the viewing means comprises at least one fixed camera located at the distal end of the blade holding element.

6. The laryngoscope according to claim 5, wherein the means for adjusting the viewing field comprises a light refracting means.

7. The laryngoscope according to claim 6, wherein the light refracting means comprises a prism or a wedge prism.

8. The laryngoscope according to any one of claims 1 to 5, wherein the viewing means comprises at least two fixed cameras elements directed to at least two different viewing fields.

9. The laryngoscope according to claim 8, further comprising means for switching from one camera to the other.

10. The laryngoscope according to any one of claims 1 to 4, wherein the viewing means comprises a movable camera element.

11. The laryngoscope according to claim 10, further comprising mechanical or electronic means for controlling the movement of the camera.

12. The laryngoscope according to claim 10, wherein the distal end of the sleeve of the blade comprises a window positioned such that, in use, the camera is positioned to visualise the laryngeal inlet of the patient.

13. A laryngoscope substantially as described herein with reference to the accompanying drawings.

14. A blade for a laryngoscope substantially as described herein with reference to the accompanying drawings.

15. A handle for a laryngoscope substantially as described herein with reference to the accompanying drawings.

16. A blade holding element for a laryngoscope substantially as described herein with reference to the accompanying drawings.

17. A method for viewing the laryngeal inlet of a patient using a laryngoscope comprising a handle, a blade holding element, a detachable blade and means for viewing the laryngeal inlet of a patient, comprising the step of adjusting the viewing field.

18. The method of claim 17 wherein the viewing means comprises at least one camera element and the blade comprises a light refracting means capable of redirecting the optical pathway of the camera.

19. The method of claim 17 wherein the viewing means comprises at least two camera elements and the viewing field is adjusted by switching the view from one camera to the other.

20. The method of claim 17 wherein the viewing means comprises at least one camera element and the viewing field is adjusted by moving the camera.

Figure 1A

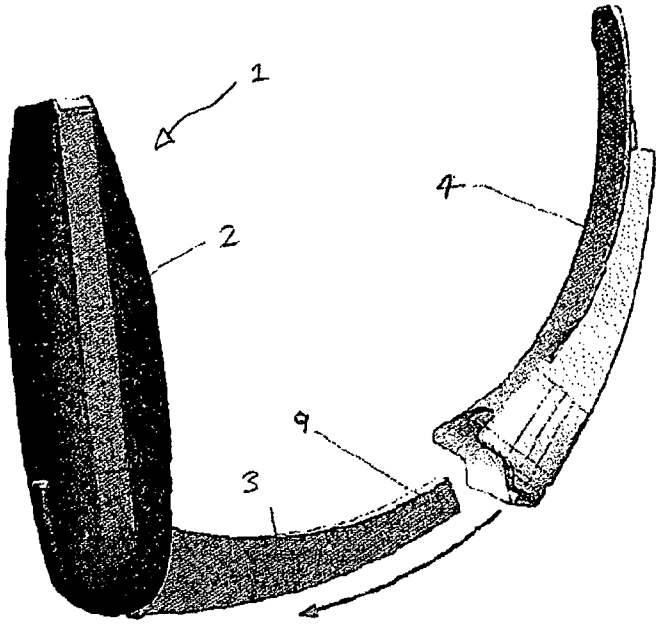

Figure 1B

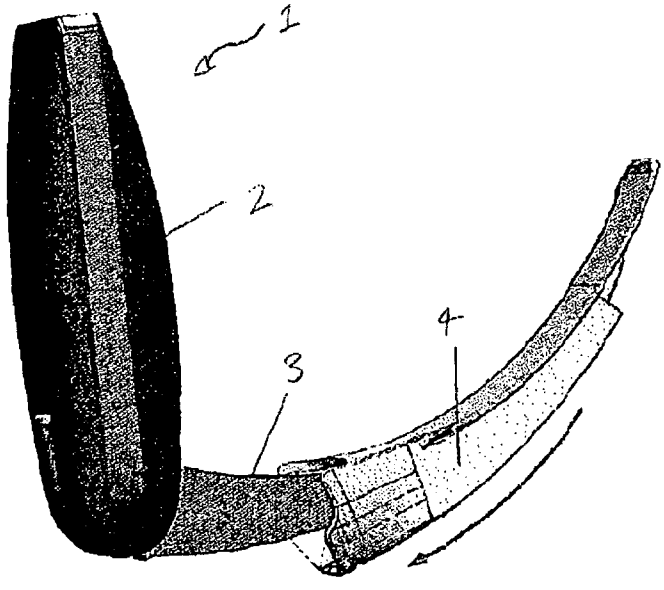

Figure 1C

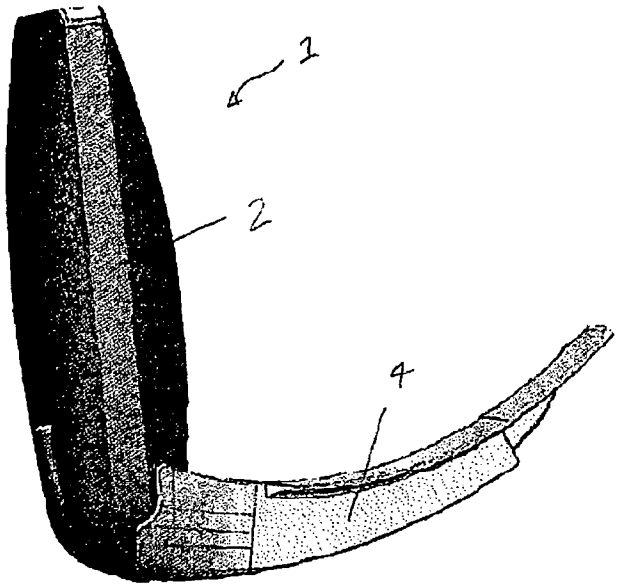

Figure 2A

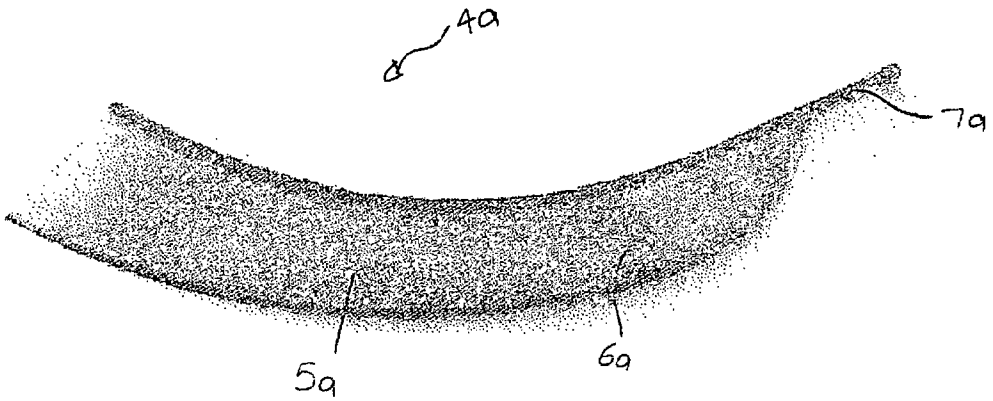

Figure 2B

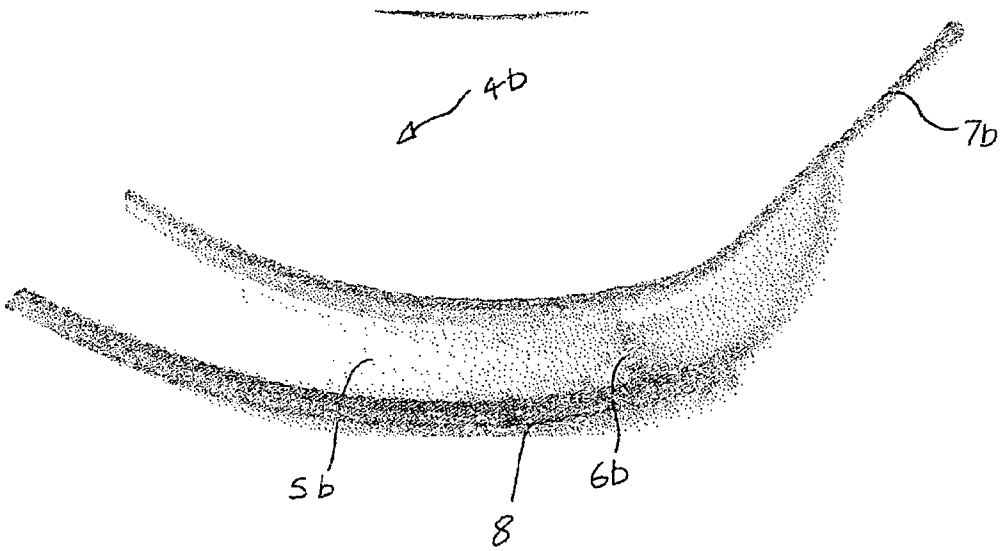

Figure 3

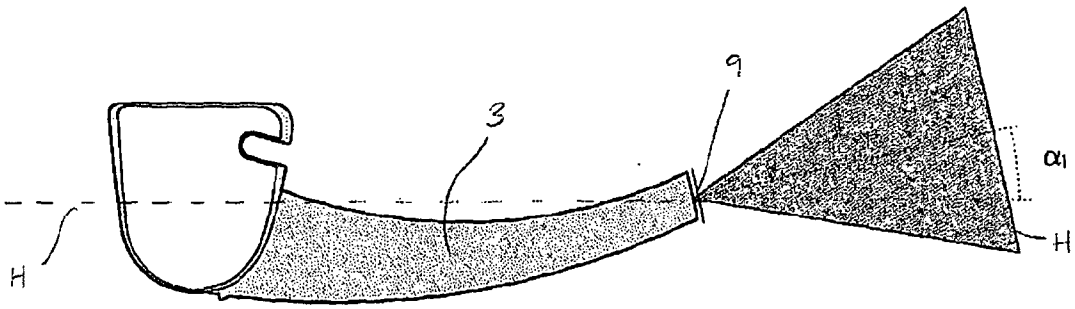

Figure 4a

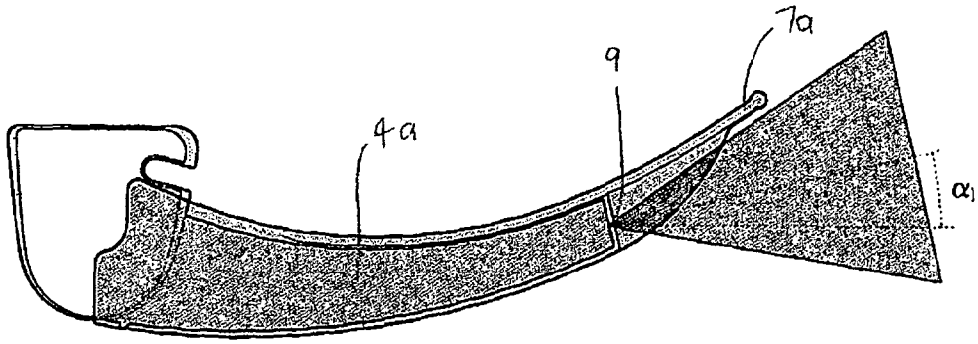

Figure 4b

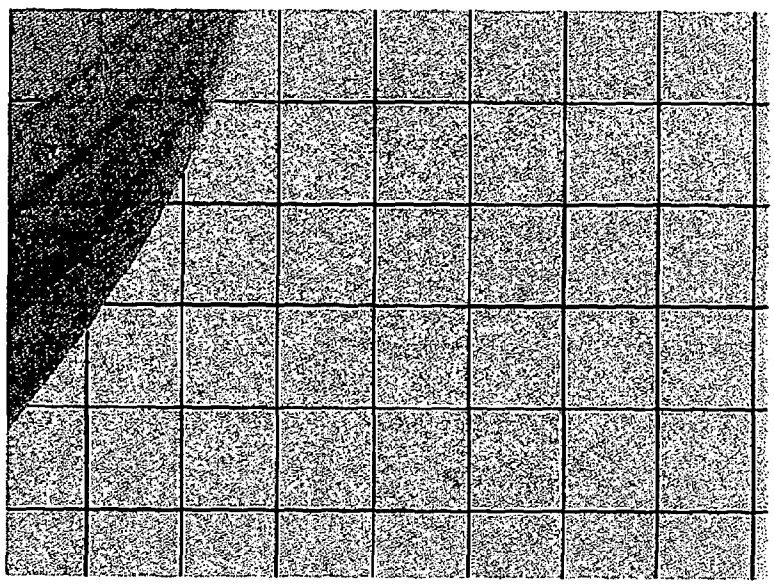

Figure 5a

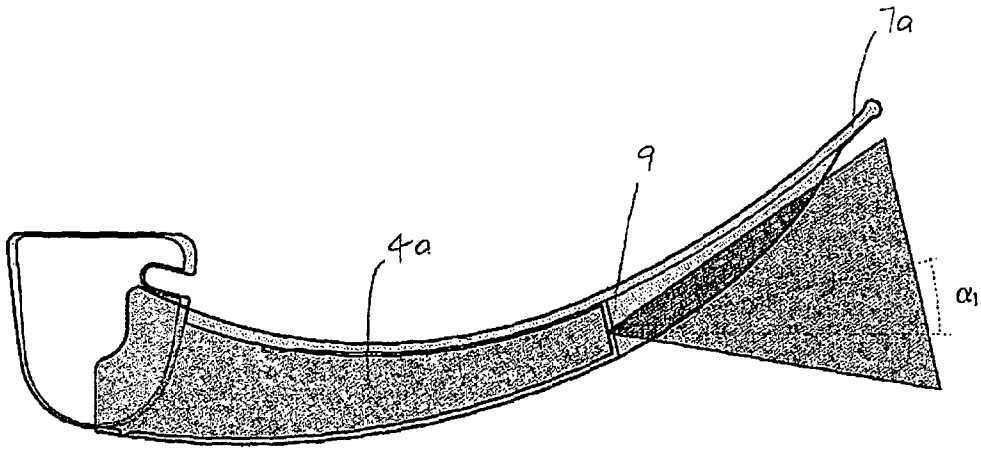

Figure 5b

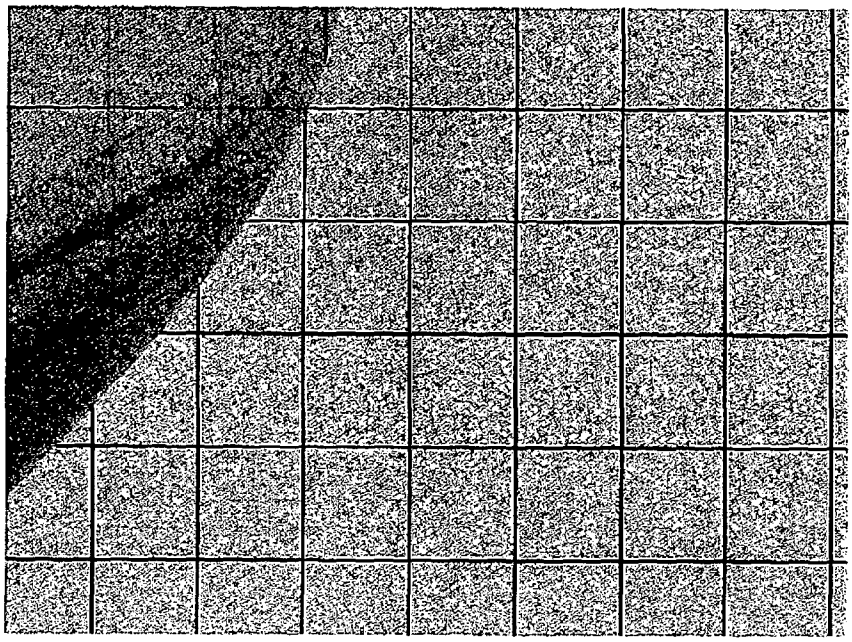

Figure 6a

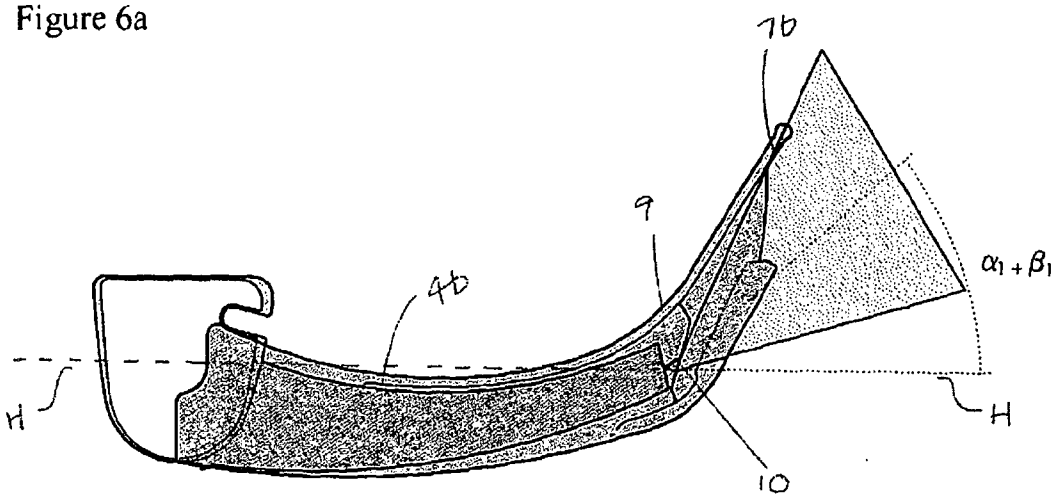

Figure 6b

Figure 7

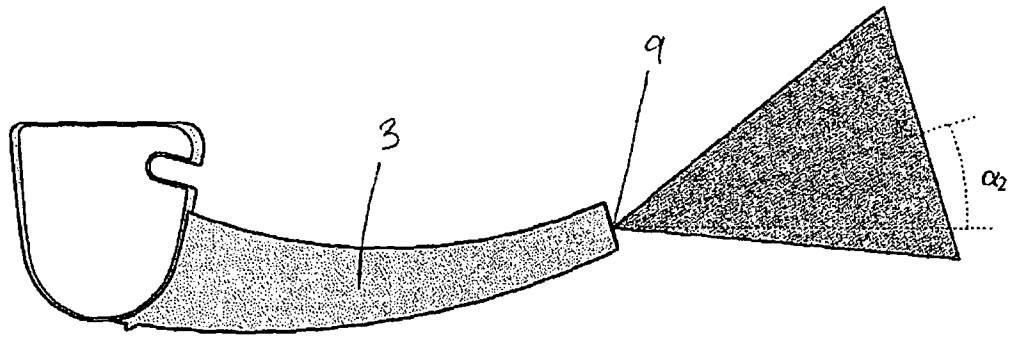

Figure 8a

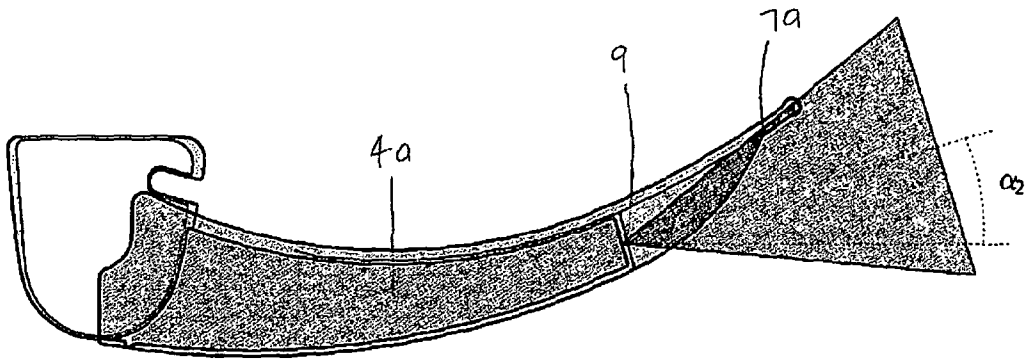

Figure 8b

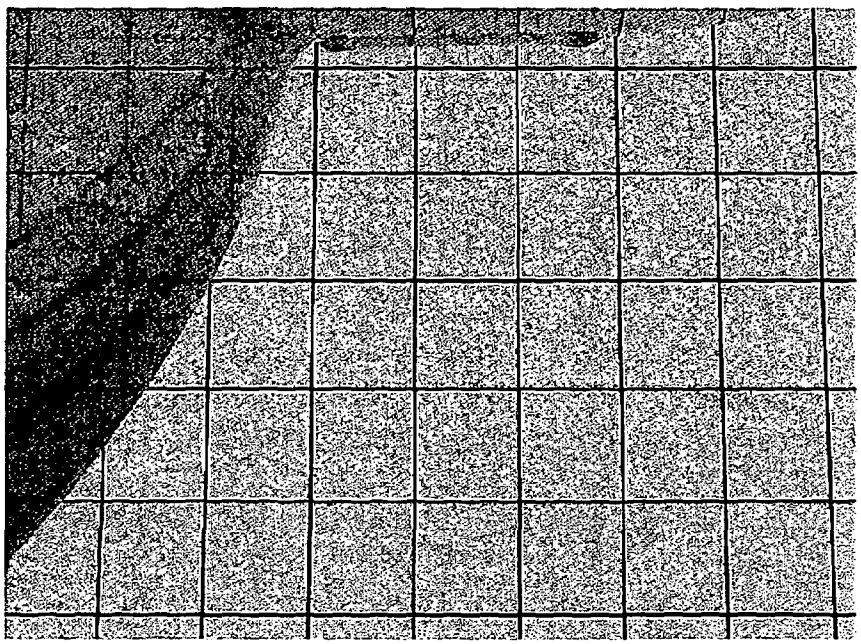

Figure 9a

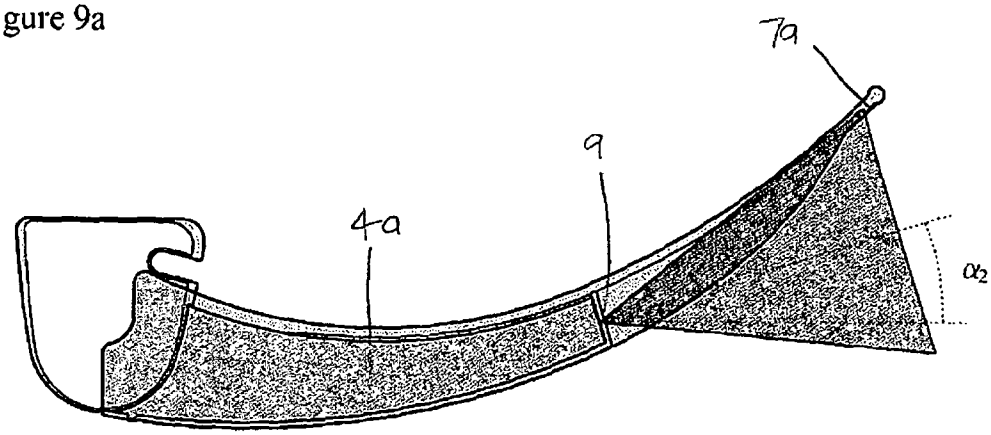

Figure 9b

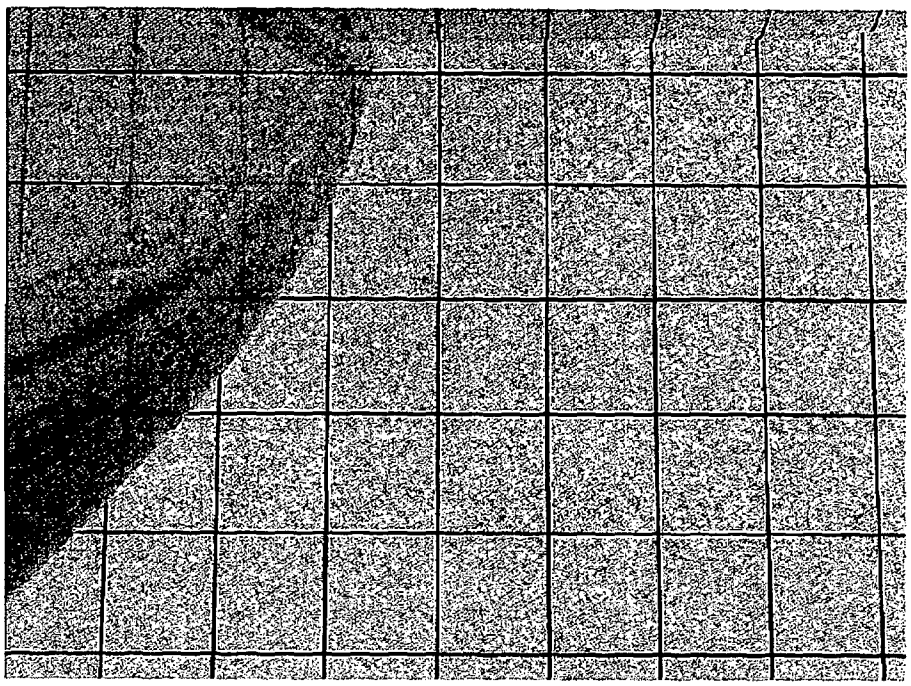

Figure 10a

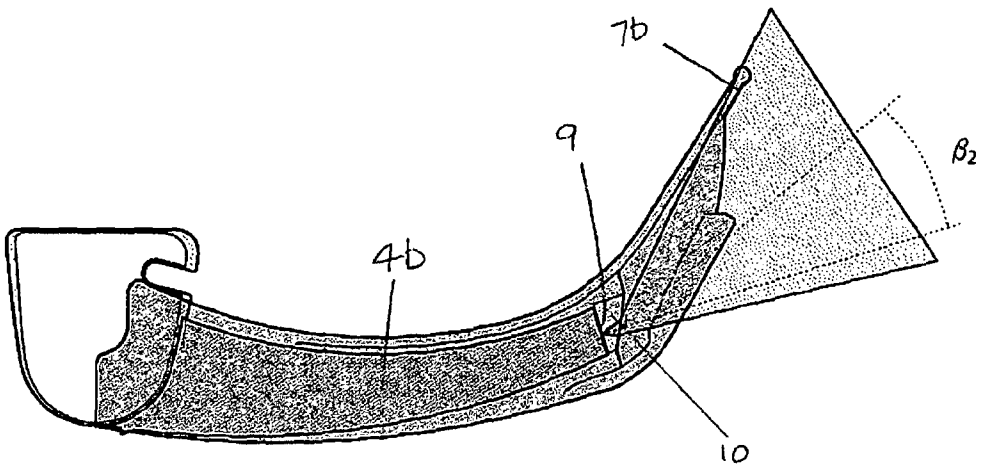

Figure 10b

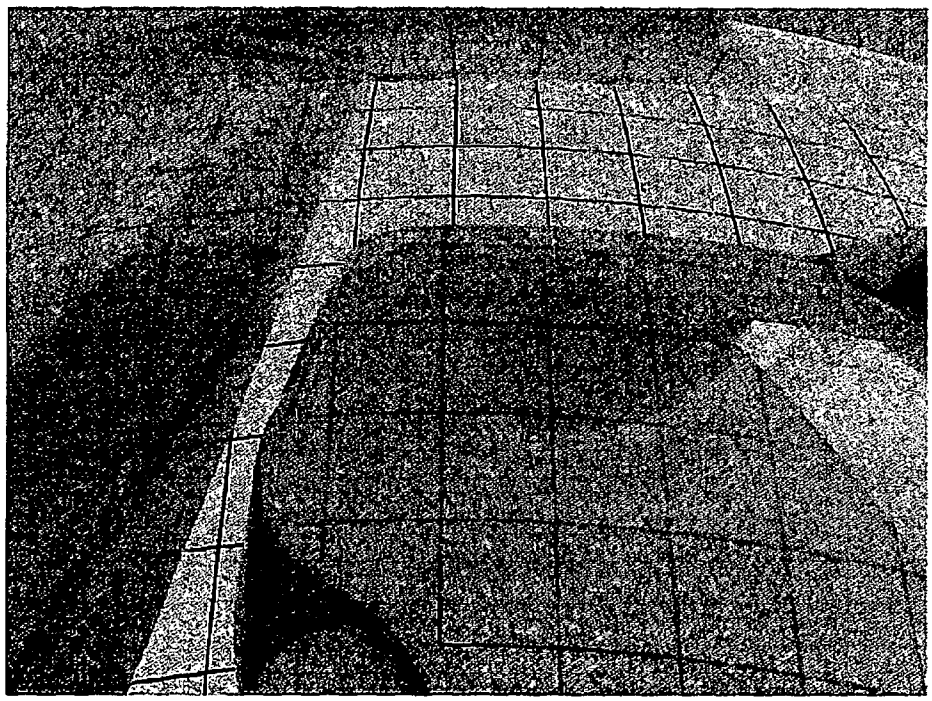

Figure 11

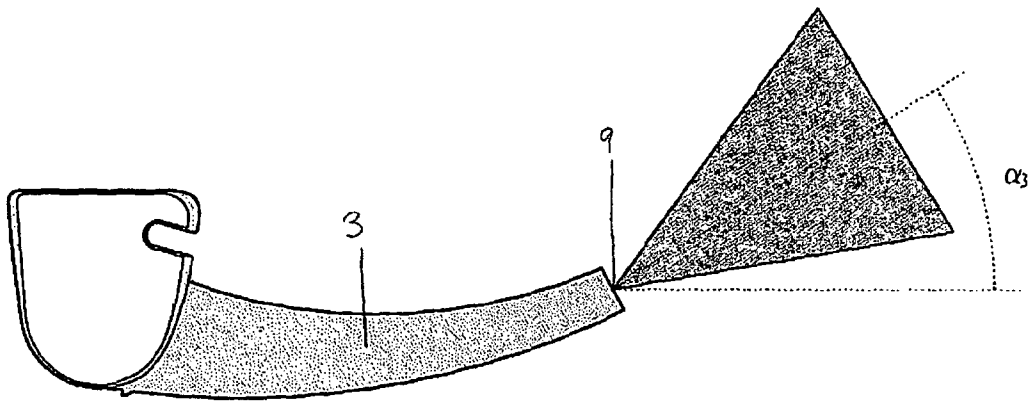

Figure 12a

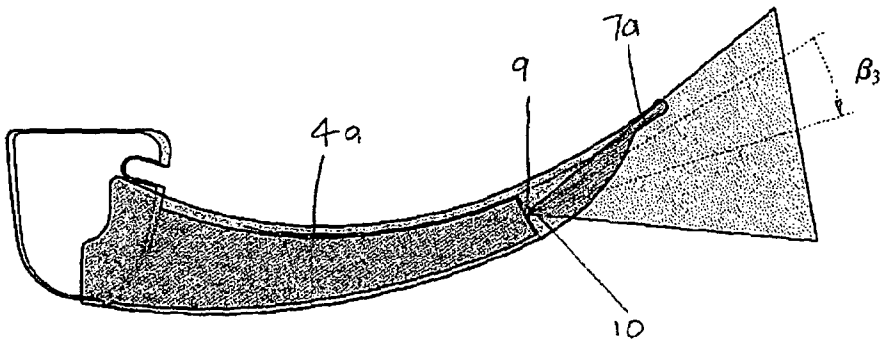

Figure 12b

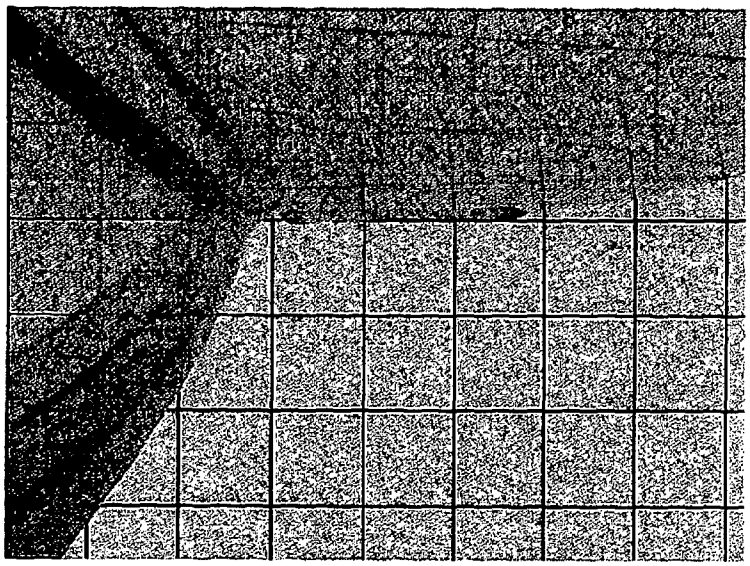

Figure 12c

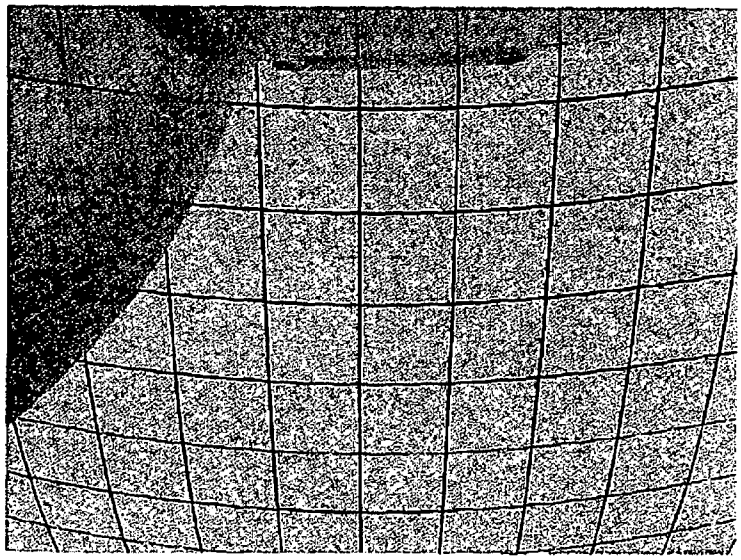

Figure 13a

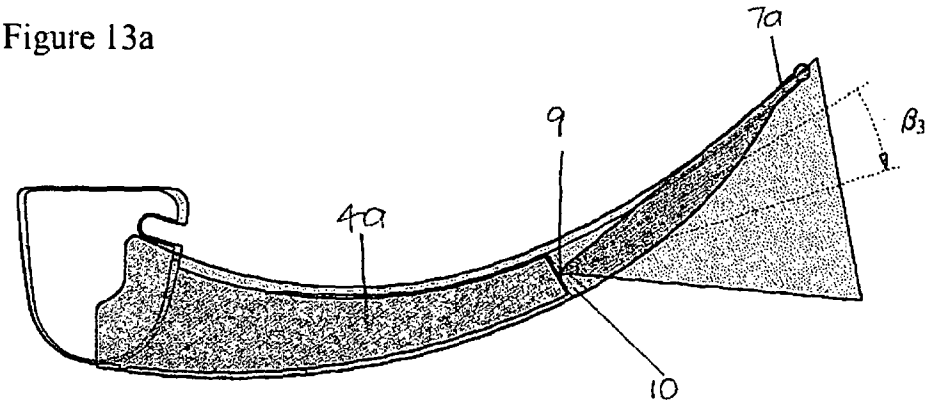

Figure 13b

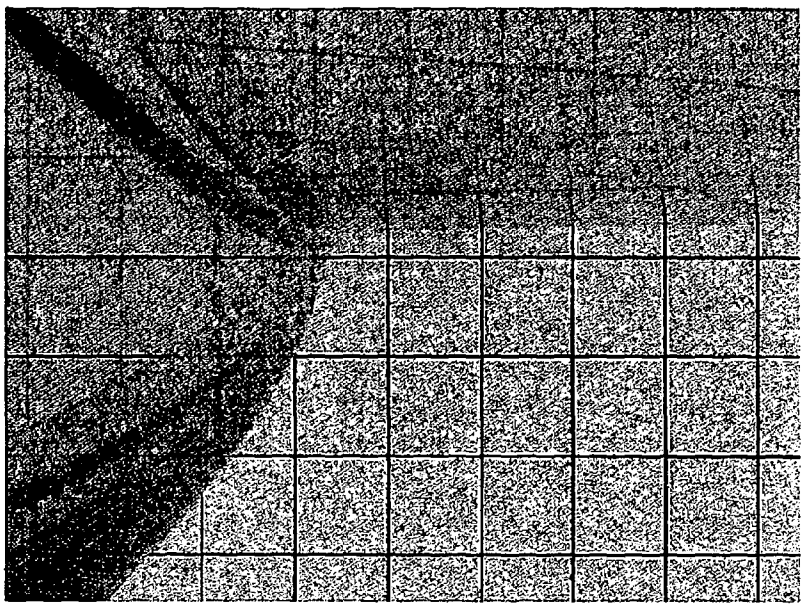

Figure 13c

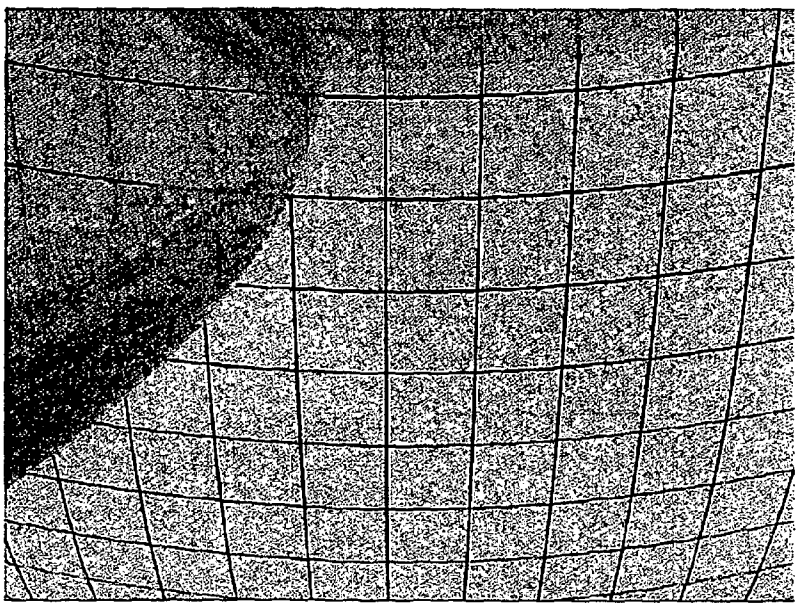

Figure 14a

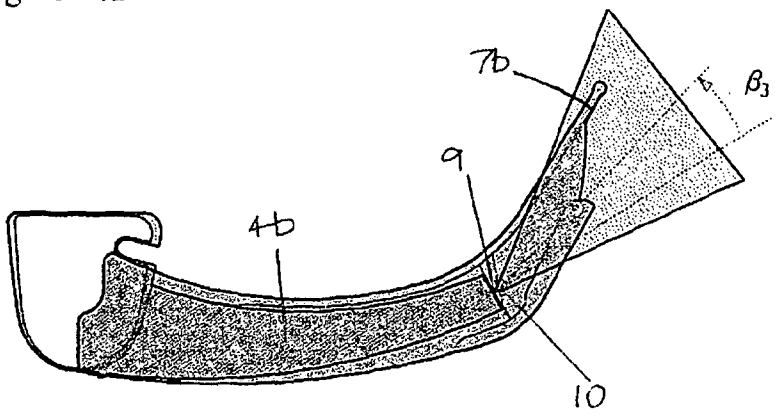

Figure 14b

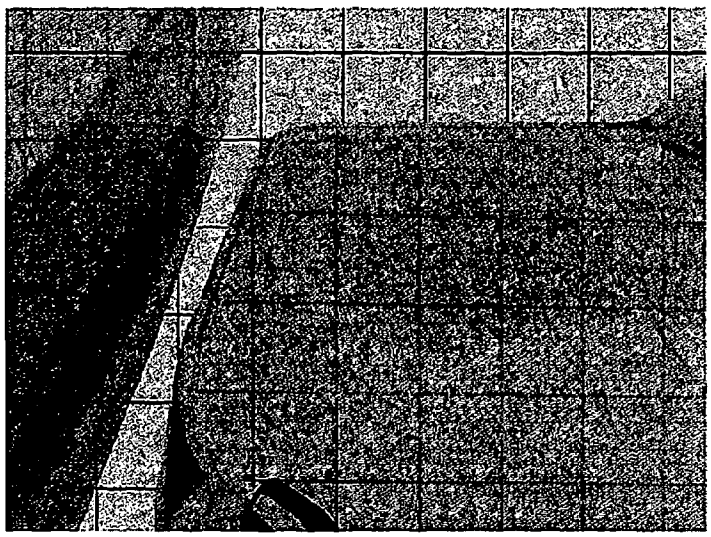

Figure 14c

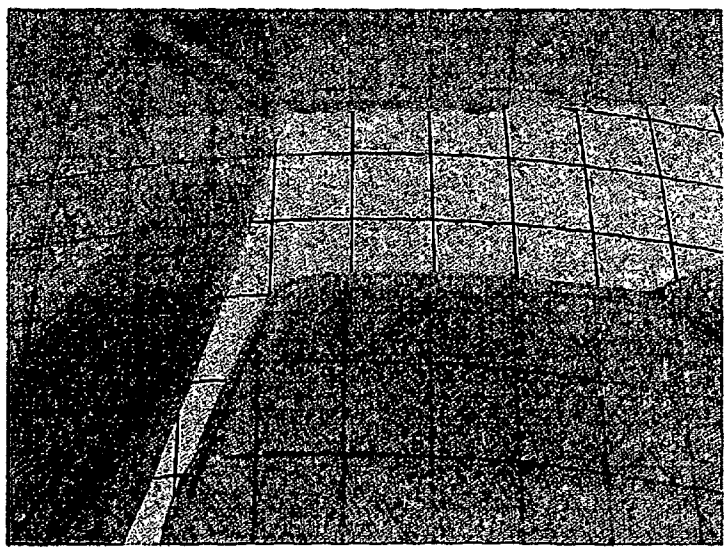

Figure 15

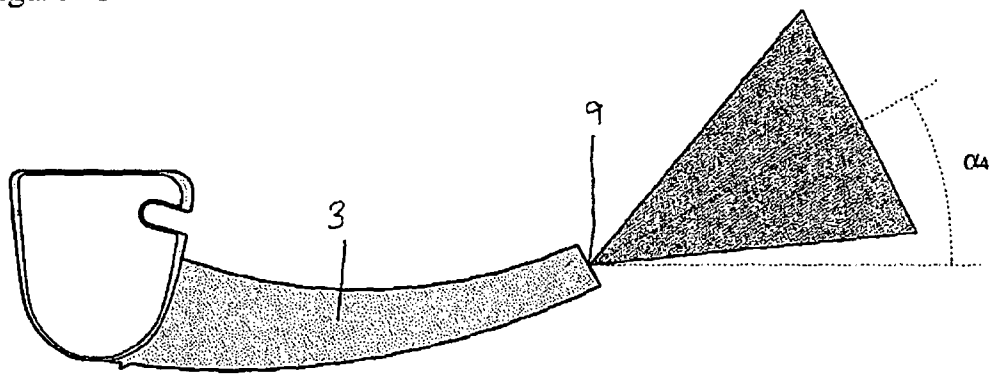

Figure 16a

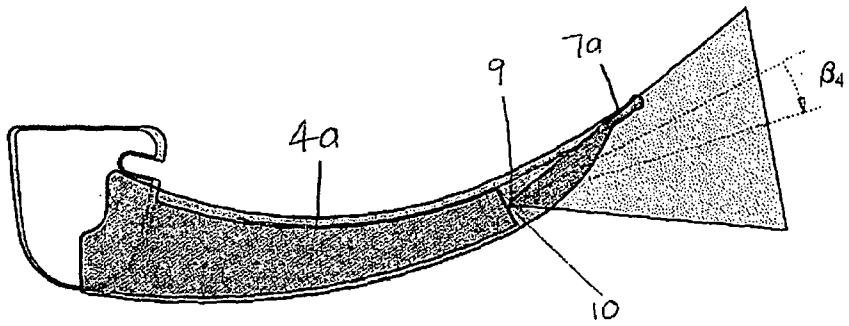

Figure 16b

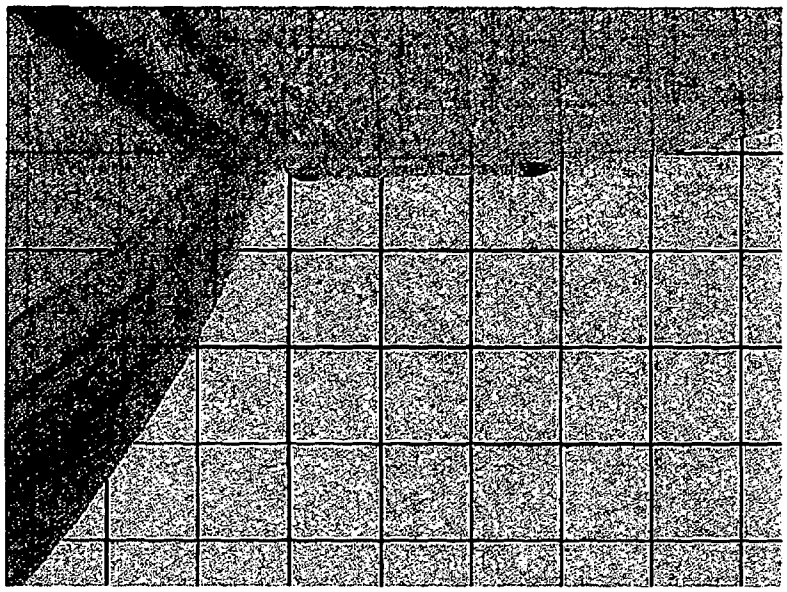

Figure 16c

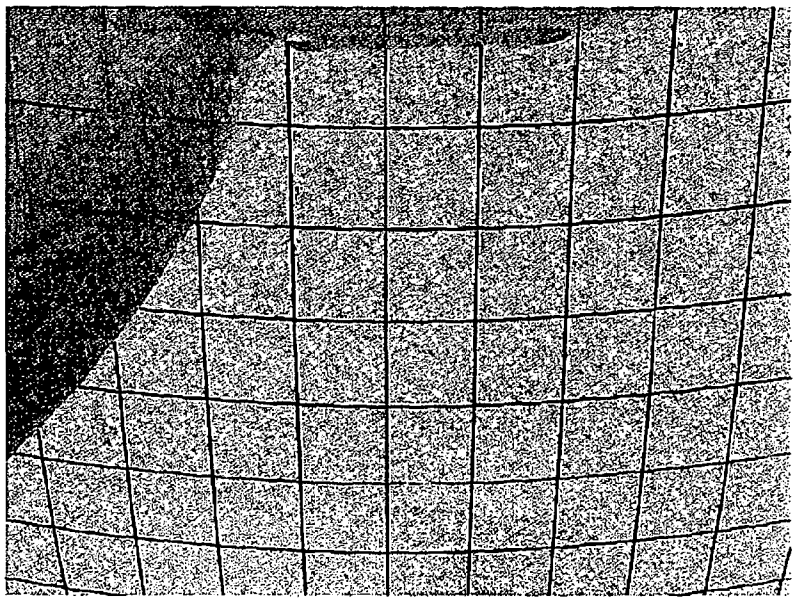

Figure 17a

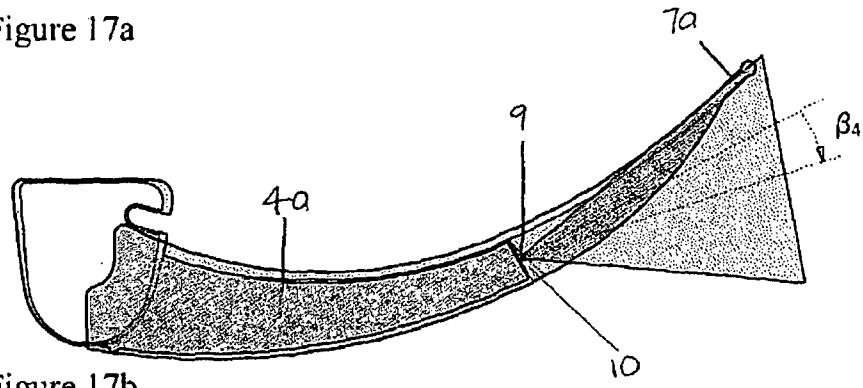

Figure 17b

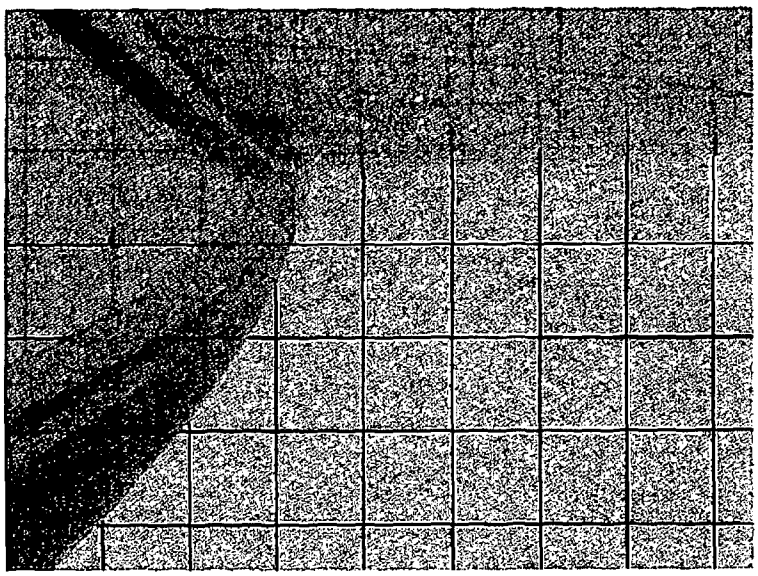

Figure 17c

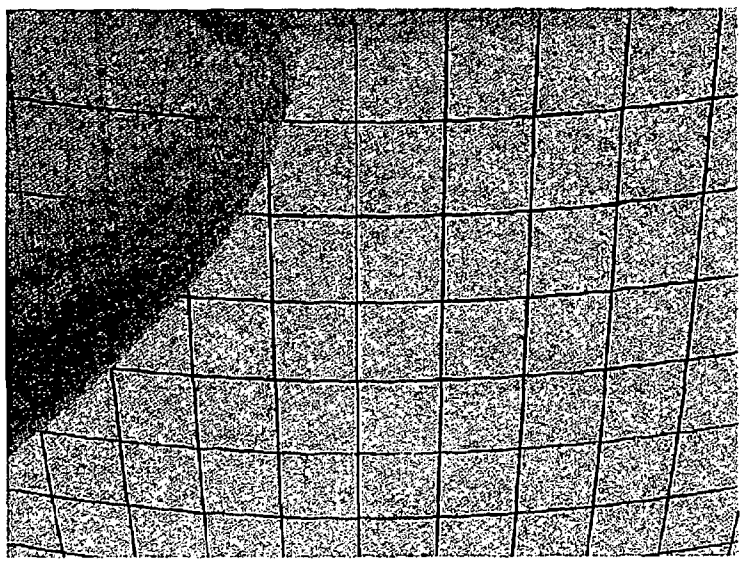

Figure 18a

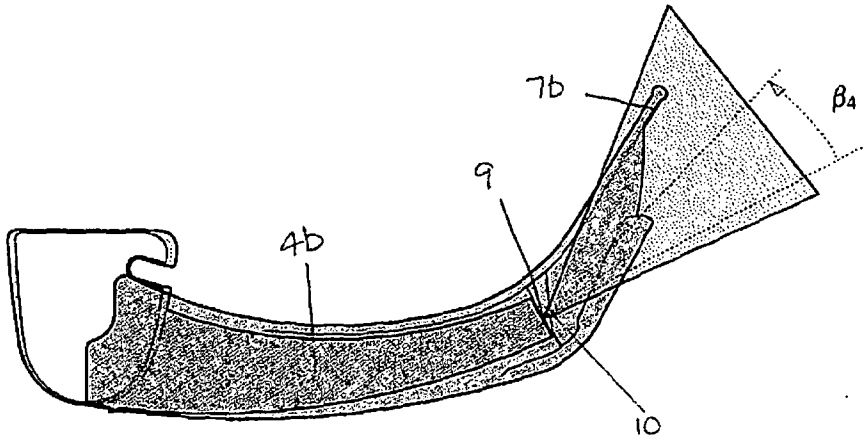

Figure 18b

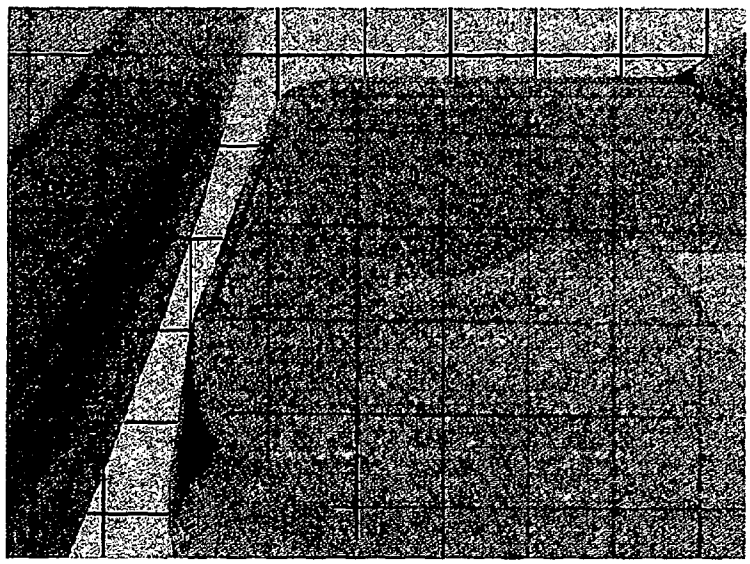

Figure 18c

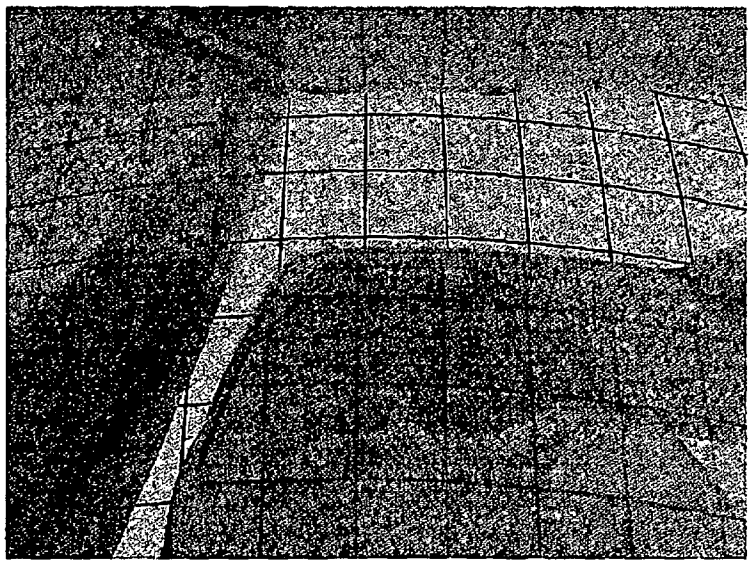

Figure 19

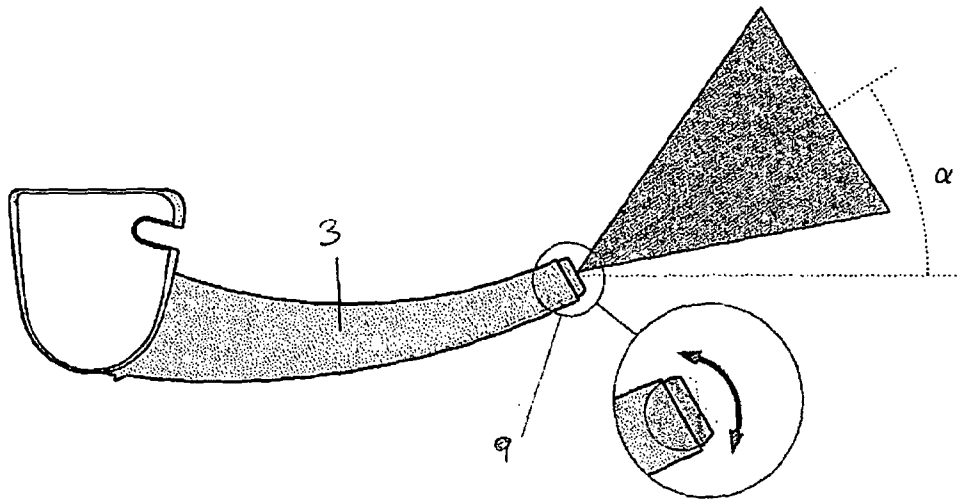

Figure 20a

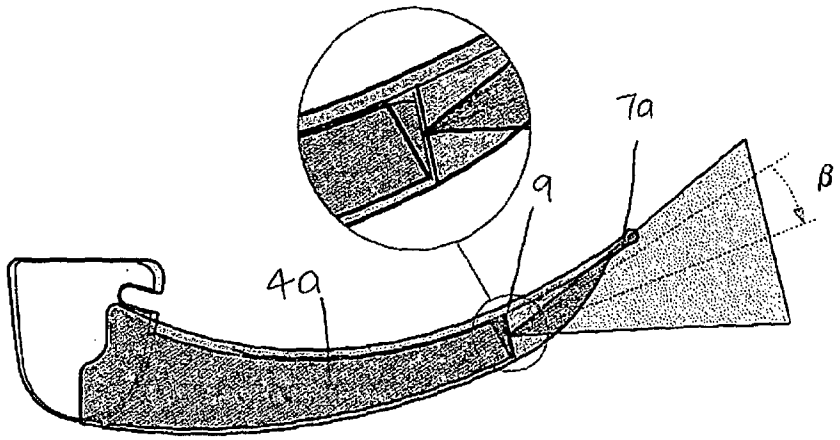

Figure 20b

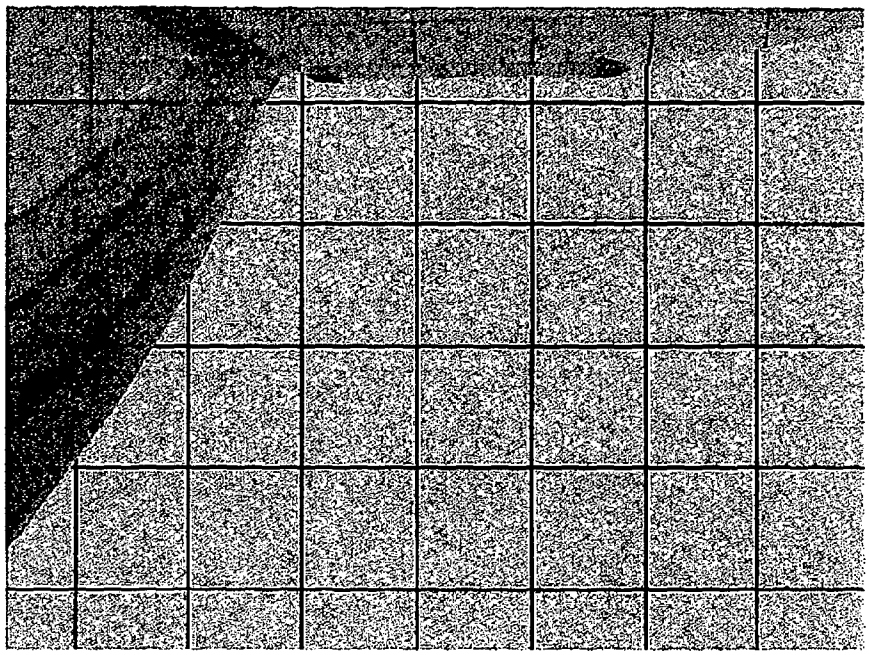

Figure 21a

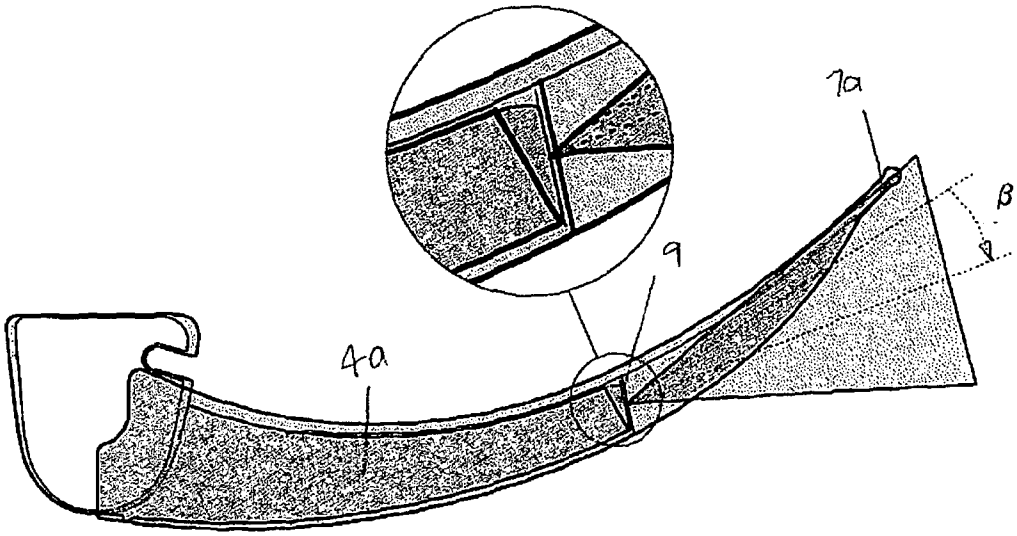

Figure 21b

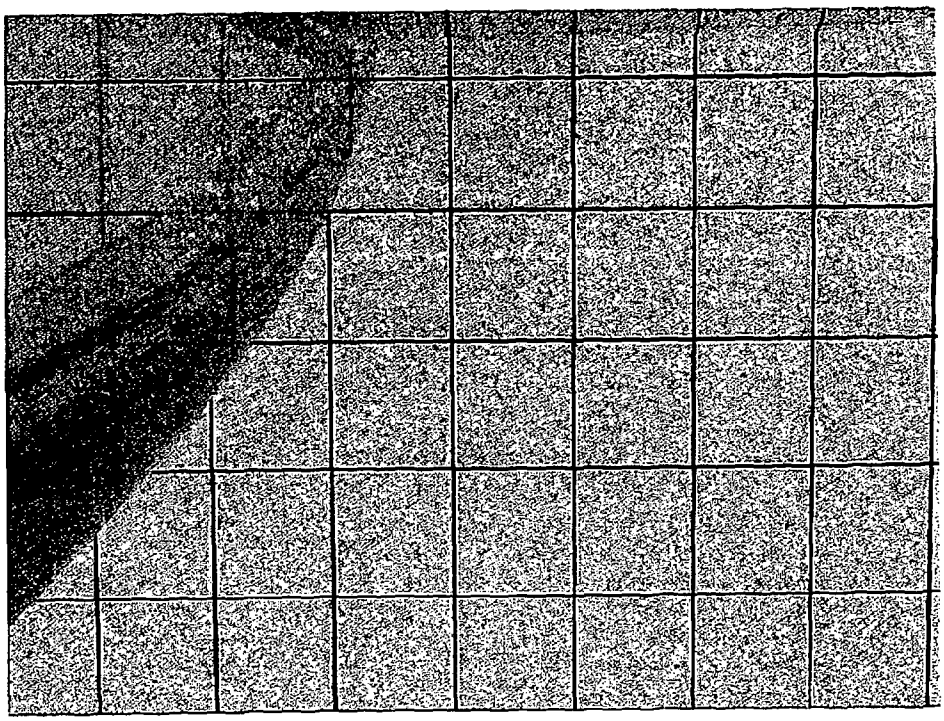

Figure 22a

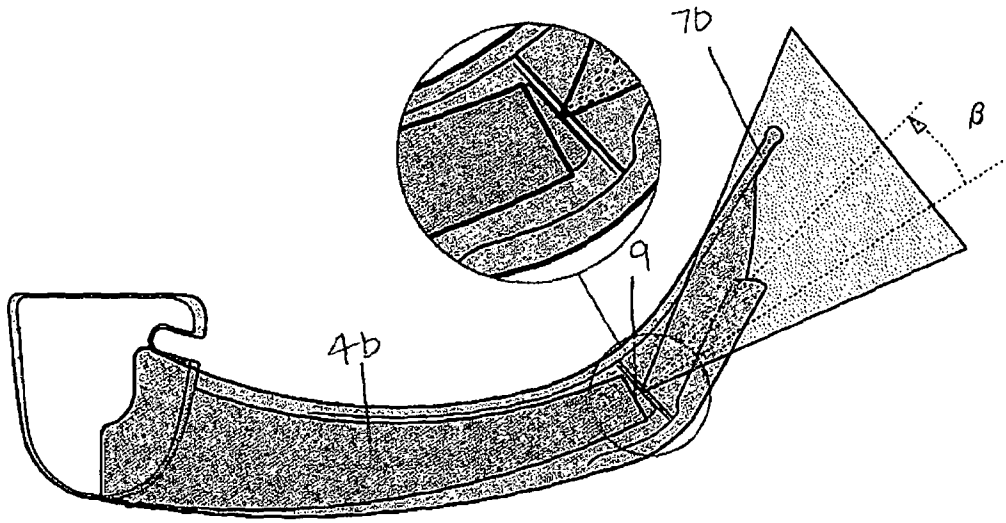

Figure 22b

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2010/001535

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61B1/045 A61B1/05 A61B1/267
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2008/157170 A2 (AVN MEDICAL TECHNOLOGIES LLC [US]; NEARMAN HOWARD S [US]; VOLTZ DONALD) 24 December 2008 (2008-12-24) paragraphs [0006], [0026] - [0029], [0036], [0038], [0039], [0065] figure 1	1-12
X	US 2008/064926 A1 (CHEN TIEN-SHENG [TW]) 13 March 2008 (2008-03-13) paragraphs [0015], [0017], [0019] figure 2	1-12
X	US 2003/181789 A1 (MAZZEI WILLIAM J [US] ET AL) 25 September 2003 (2003-09-25) paragraphs [0008] - [0010], [0017], [0022] - [0023] figure 3	1-12

-/--

[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
20 October 2010	27/10/2010

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Faymann, Juan

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 381 787 A (BULLARD JAMES R [US]) 17 January 1995 (1995-01-17) column 2, lines 63-67 column 3, lines 8-11 column 5, lines 13-23 figure 5	1-12

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB2010/001535

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. [X] Claims Nos.: 17-20
because they relate to subject matter not required to be searched by this Authority, namely:

see FURTHER INFORMATION sheet PCT/ISA/210

2. [X] Claims Nos.: 13-16
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

see FURTHER INFORMATION sheet PCT/ISA/210

3. [ ] Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. [ ] As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. [ ] As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. [ ] As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. [ ] No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

[ ] The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

[ ] The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

[ ] No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.1

Claims Nos.: 17-20

Claim 17 relates to subject-matter considered by this authority to be covered by the provisions of Rule 39.1(iv) PCT. The claims discloses a method of viewing the laryngeal inlet of a patient using a laryngoscope. Such a method entails an invasive procedure, wherein the insertion of the laryngoscope constitutes a surgical step. Thus claim 17 is a method of treatment by surgery. As dependents of claim, claims 18-20 also fall under the provisions of Rule 39.1(iv) PCT.

Continuation of Box II.2

Claims Nos.: 13-16

Claims 13-16 only contain references to the description and the drawings. According to Rule 6.2(a) PCT, claims should not contain such references except where absolutely necessary, which is not the case here.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.2), should the problems which led to the Article 17(2) declaration be overcome.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/GB2010/001535

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2008157170 A2	24-12-2008	AU 2008266236 A1	24-12-2008
		CA 2689676 A1	24-12-2008
		CN 101820811 A	01-09-2010
		EP 2155040 A2	24-02-2010
		JP 2010528820 T	26-08-2010
		KR 20100033511 A	30-03-2010
US 2008064926 A1	13-03-2008	TW 309971 Y	21-04-2007
US 2003181789 A1	25-09-2003	AU 2003225845 A1	08-10-2003
		CA 2479019 A1	02-10-2003
		EP 1487319 A1	22-12-2004
		WO 03079889 A1	02-10-2003
		US 2005043590 A1	24-02-2005
US 5381787 A	17-01-1995	NONE	