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- (54) Benævnelse: **LARYNGOSKOPSYSTEM**
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WO-A2-2007/066134
US-A- 4 579 108
US-A- 5 810 770
US-A1- 2006 276 693
US-A1- 2007 195 539
US-A1- 2008 045 801
US-B1- 6 569 089
US-B2- 6 655 377
US-B2- 6 817 973
US-B2- 7 347 863
None

DESCRIPTION

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates generally to an airway management device and system and specifically to a laryngoscope system capable of allowing a health care provider to establish an airway.

2. Description of the Prior Art

[0002] Over 20 million intubation procedures are performed each year in the United States either as a routine part of surgery or in emergency situations resulting from trauma, cardiopulmonary arrest or other disease processes. In an intubation procedure, it is necessary to insert an endotracheal tube (ET tube) in order to maintain a patient's respiratory function. The tube is inserted into a patient's trachea via either the mouth or nasal tract so that the airway remains open and oxygen reaches the patient's lungs.

[0003] Practitioners use an instrument known as a laryngoscope to help in the placement of the ET tube. This instrument typically comprises a handle, a blade, and a light. The practitioner uses the device to move the tongue and epiglottis to one side so that the airway may be properly identified. Once the airway is properly identified, the practitioner inserts the tube with one hand while holding the laryngoscope with the other. In a small percentage of patients, the airway cannot be identified with the laryngoscope alone. With these patients, practitioners sometimes use a device known as a "bougie". This bougie is a small diameter flexible cylinder of metal, plastic or other material that may serve as a guide for placement of a larger ET tube.

[0004] The laryngoscope predominantly used today to accomplish this task was developed in the 1940's. When performed by an experienced practitioner, the procedure is usually quick and uneventful. However, even in the hands of well skilled individuals, there is still an unacceptable number of occurrences in which placement of the endotracheal tube is difficult or impossible resulting in an inability to provide the patient with oxygen leading to death or injury. Difficulty in placing the endotracheal tube may be due to trauma, abnormal anatomy, disease processes or for unknown and unpredictable reasons.

[0005] Over the years, there have been many attempts to improve upon the design of the original laryngoscope, but those attempts have been largely unsuccessful as evidenced by the continued use today of virtually the same device developed in the 1940's. More recently due to advances in miniaturization of technology, devices have been developed known as video

laryngoscopes that greatly improve the ability to adequately locate the vocal cords and appropriately place the endotracheal tube. These devices are generally constructed with a small camera placed at the distal end of the laryngoscope and the image obtained by that camera is viewed on a remote monitor. However, these devices are expensive and often inconvenient to use. Moreover, prior art devices still fail to offer a solution to the difficult intubations in which a bougie is necessary.

[0006] What is needed is an inexpensive, sanitary, easy to use laryngoscope system that may be used in all situations, including the most difficult intubations in the most challenging environments.

[0007] Document WO 2007/066134 A2 discloses a laryngoscope sheath which is slideably coupled to a laryngoscope arm, the sheath having coupling means for connecting the sheath to the laryngoscope arm.

SUMMARY OF THE INVENTION

[0008] It is an object of the invention to provide an inexpensive, sanitary, easy to use laryngoscope system that may be used in all situations, including most difficult intubations in the most challenging environments.

[0009] The present invention is defined in claim 1. It provides a laryngoscope capable of being connected to a monitor and power source, said laryngoscope being comprised of a handle, an arm, a camera, a light, and a disposable sheath; wherein the sheath is slideably and removably coupled to the arm; the sheath being further comprised of a canal capable of being threaded with a bougie; the handle being further comprised of a remote ejection element mechanically connected to a spring element capable of ejecting the sheath from the arm; the arm being removably coupled to the handle. The system is further comprised of a display device, and an IV pole attachment. The sheath is remotely ejected by depressing a thumb ejector switch on the handle which releases a clasp at the coupling point and further releases a spring element held in compression which, upon release, forcibly moves the sheath along the length of the arm, such that the sheath becomes detached from the arm. The sheath is further comprised of a small canal at least partially running along the outside length that serves as a guide for the bougie. With the laryngoscope properly placed, the practitioner may thread a bougie through the sheath's bougie canal into the airway and use this bougie as a guide for the ET tube.

[0010] The laryngoscope is further comprised of a light and a camera. The lens of this camera is located at the distal end of the arm and the signal is transmitted either wirelessly or through a cord to the display device. The light is also located at the distal end of the arm. The cord further transmits power from a power source to the light and camera. In one embodiment of the present invention, the camera is located in the arm of the camera with the lens positioned near the body of the camera. In another embodiment, the body of the camera is located in the

handle and communicates with the lens through a cable. In still another embodiment of the present invention, the image collected by the lens is reflected on a mirror or prism.

[0011] The display unit is comprised of a container, a screen, and a battery. The container is configured such that it may be removably coupled to an IV pole attachment or sit upright when not attached to the IV pole attachment.

[0012] The IV pole is conventional and commercially available. The IV pole attachment is comprised of an attachment receiver that allows the user to quickly attach and separate the display unit from the IV Pole attachment, an IV clamp with a "C" shaped opening, and a laryngoscope storage receptacle.

[0013] In one aspect of the present invention, the laryngoscope is comprised of a heating element.

[0014] In one aspect of the present invention, the laryngoscope is capable of being motion activated such that the laryngoscope is powered on upon movement.

[0015] In another aspect of the present invention, the laryngoscope is capable of being motion activated such that the laryngoscope is powered off when no movement is detected for a predetermined period of time.

[0016] In one aspect of the present invention, the screen is capable of being motion activated such that the screen is powered on upon movement.

[0017] In another aspect of the present invention, the screen is capable of being motion activated such that the screen is powered off when no movement is detected for a predetermined period of time.

[0018] In another aspect of the present invention, the arm is removably coupled to the handle.

[0019] In another aspect of the present invention, a user using the ejection element may eject the sheath without touching the sheath.

[0020] In another aspect of the present invention, the display unit is comprised of a stand such that said unit is capable of standing upright.

[0021] In another aspect of the present invention, the laryngoscope is capable of wirelessly communicating with the screen.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022]

Figure 1 is a side perspective view of the laryngoscope system in accordance with a preferred embodiment.

Figure 2A is an isometric cut-away right side view of the laryngoscope in the open position with the arm and sheath attached in accordance with a preferred embodiment.

Figure 2B is an isometric cut-away right side view of the laryngoscope of Fig. 2A with the thumb ejector switch in the extended position.

Figure 3 is an isometric, rear, and side view of the laryngoscope arm and a partial view of the laryngoscope handle, in accordance with a preferred embodiment.

Figure 4 is an isometric right side view of the laryngoscope with the arm in the closed position in accordance with a preferred embodiment.

Figure 5 is an isometric right side and rear view of the laryngoscope with the arm in the closed position without the sheath attached in accordance with a preferred embodiment.

Figure 6 is an isometric right side, top view of the sheath, in accordance with a preferred embodiment.

Figure 7 is a top, front, and left side isometric view of the display unit with the stand in the open position.

Figure 8 is rear elevation view of the display unit with the stand in the open position.

Figure 9 is a right side isometric view of the display unit with the stand in the open position.

Figure 10 is a rear isometric view of the IV pole attachment.

Figure 11 is a front view of the IV pole attachment.

Figure 12 is a block diagram depicting the camera unit.

Figure 13 is a block diagram depicting the laryngoscope motion sensor system.

Figure 14 is a block diagram depicting the display unit motion sensor system.

Figure 15 is a block diagram depicting the laryngoscope and display unit wireless communication system.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0023] Referring to Figs. 1-15 there is shown a laryngoscope system 12 of the present invention. This laryngoscope system 12 is generally comprised of a laryngoscope 14, a display

unit **72**, and an IV pole attachment **98** capable of being coupled to an IV pole **128**.

[0024] Referring to **Figs. 1- 6**, the laryngoscope **14** of the present invention comprises a handle **16**, a curved blade or arm **18**, a light **20**, a camera **22**, and a disposable sheath **24**. The handle **16** of the laryngoscope **14** has a curved arm **18** attached. In one aspect of the present invention, the arm **18** is removably coupled to the handle **16**. Slideably coupled to the arm **18** is a sheath **24** which snaps into place at a coupling point **68** (**Fig. 3**). In the preferred embodiment, this sheath **24** is formed from plastic and is at least partially clear so as to allow light emitted from the light **20** to pass through it. Referring to **Fig. 6**, in the preferred embodiment, the sheath **24** is comprised of a transparent window **28**. The sheath **24** has one or more clasps **30** on its proximal end (**Fig. 6**) which may be removably coupled to the arm **18** at the coupling point **68** (**Fig. 3**). In one aspect of the present invention, a user, using the thumb ejector switch **34**, may eject the sheath **24** without physically touching the sheath **24**. Referring to **Figs. 2A, 2B** and **Fig. 5**, the thumb ejector switch **34** is located at the upper end of the handle **16**. The thumb ejector switch **34** is comprised of a plunger block **36**, an ejection rod **38**, and a protrusion **40**. The thumb ejector switch **34** is coupled to the ejection rod **38** which is coupled at the top end with the plunger block **36**. The plunger block **36** is comprised of the protrusion **40**. A return spring **42** is coupled to the thumb ejector switch **34**. This return spring **42** maintains the ejection rod **38** in a retracted position as a rest state (**Fig. 2A**). Above the plunger block **36** is a retaining receptacle **44**. This retaining receptacle **44** is structured and arranged such that it is capable of nesting the protrusion **40** and maintains the thumb ejector switch **34** in a rest position and prevents accidental deployment of the ejection rod **38**.

[0025] Referring to **Figs. 2B, 3, 5** and **6**, the sheath **24** is remotely ejected by depressing the thumb ejector switch **34** (**Fig. 2B**) on the handle **16** which releases the clasp **30** at a sheath connection ridge **58** located on the arm **18** at the coupling point **68**. The thumb injector switch **34**, when depressed, travels down a switch channel **31** (**Fig. 5**). In one embodiment, thumb ejector switch **34** further releases a spring element **60** (**Fig. 3**) held in compression which, upon release, forcibly moves the sheath **24** along the length of the arm **18**, such that the sheath **24** becomes detached from the arm **18**. Referring to **Fig. 6**, in one aspect of a preferred embodiment, the clasp **30** has a score line **32** or thinner layer of material. This score line **32** creates a weakened area in the clasp **30** so that when depressed by the ejection rod **38**, the clasp **30** is deformed at the score line **32**. In one aspect of the present invention, the clasp **30**, after ejection, cannot be returned to its original undeformed configuration without breaking at the score line **32**. Such breaking prevents the sheath **24** from being reused and thus, helps prevent contamination.

[0026] In one embodiment of the invention, and as shown in **Fig. 6**, the sheath **24** is further comprised of a small canal **26** running at least partially along the outside length that serves as a guide for a bougie **70**. With the laryngoscope **14** properly placed, the practitioner may thread the bougie **70** through the sheath's bougie canal **26** into the airway and use this bougie **70** as a guide for an ET tube (not shown). As shown in the **Fig. 6**, in the preferred embodiment, this canal **26** is open on one side **27** such that the bougie **70** may be inserted and removed through this open side **27**. This open side **27** permits the user to maintain the laryngoscope **14**

in the airway while threading the ET tube over the bougie 70. In this embodiment, the bougie 70 is forced out of the canal 26 through the side opening 27 by the ET tube. In the preferred embodiment, this canal with its open side 27 is "C" shaped. This "C" shape helps maintain the bougie 70 within the canal 26 while still allowing the bougie 70 to be removed through the open side 27. Although the canal 26 of the preferred embodiment is open and forms a "C" shape, the canal 26 need not be open and need not be "C" shaped. Rather, the canal 26 can be closed on the sides so as to completely surround the bougie 70 along its length and can be circular or any other suitable shape.

[0027] As best shown in Fig. 5, the laryngoscope 14 also has a light 20 and a camera 22 positioned at the distal end of arm 18 and confined within arm walls 10 beneath a transparent cap 66. This cap 66 is clear and allows light to reach the lens 56 and light generated from the light 20 to exit the arm 18. A lens 56 for this camera 22 is located in the arm 18 and the signal is transmitted through a cord 96 to a display unit 72. While in the preferred embodiment the camera 22 is solid state and does not rely upon mirrors or prisms, the camera 22 may be comprised of a lens 56 that focuses light as an image on a prism. The image may then be reflected by the prism to the camera 22.

[0028] Referring to Figs. 5 & 12, the lens 56 of the camera 22 is also located at the distal end of the arm 18. In another embodiment, the main portion of the camera 22 is located in the handle 16 and communicates with the lens 56 through a fiber optic cable. In one embodiment, the camera 22 transmits the signal directly to the display unit 72 without the use of mirrors and prisms. In the preferred embodiment, the camera 22 is a complementary metal-oxide-semiconductor (CMOS) camera. However, other cameras 22 may be used including those incorporating charge-coupled device (CCD) technology.

[0029] In the preferred embodiment, the camera 22 transmits video images to the display unit 72. Referring to Fig. 12, the camera 22 is comprised of a lens 56, a shutter 51, an image sensor 57, a processor or CPU 59, and a flex circuit 61. Images collected by the camera 22 are displayed on the screen 88 of the display unit 72. Although the camera 22 of the preferred embodiment produces video images, it can also generate still images which may also be displayed on the screen 88 of the display unit 72.

[0030] Referring to Fig. 5, in the preferred embodiment, the arm 18 is comprised of a heating unit 21. This heating unit 21 heats the light 20 and camera 22 area and prevents the light 20 and camera 22 from developing moisture which may obscure the images gathered by the camera 22. The heating unit 21 is comprised of a thermistor 23 which monitors the temperature of the heating unit 21 and shuts the unit 21 off when a predetermined temperature is reached. In the preferred embodiment, such temperature is approximately 120 degrees Fahrenheit. The arm 18 is further comprised of a flex circuit 61 (Fig. 5). This circuit 61 is capable of supplying power to the camera 22 light 20 and heating unit 21 as well as transmitting information (including images) between the camera 22 and display unit 72. The handle 16 and arm 18 are each further comprised of heater switch 53 and 55. When the laryngoscope 14 is in the folded position, the heater switch 53 and 55 is in the open position

and no power to the heater unit 21 is transferred. In this folded position, connectors 52 are also open such that power is not transferred to the light 20, camera 22, and heating unit 21.

[0031] As shown in Figs. 3 & 4, in alternative embodiments, a sheath switch 25 is located on the arm 16. When the sheath 24 is in place and the arm 18 is in the working/engaged position as shown in Figs. 2A and 2B, power is supplied to the heating unit 21. However, when the sheath 24 is not present, as shown in Fig. 3, or the arm 18 is in the folded/disengaged position depicted in Fig. 4, the heater switch 53, 55 is open, and no power is supplied to the heater unit 21. The sheath switch 25 interrupts power to the handle portion 53 of heater switch 53, 55.

[0032] The cord 96 further transmits power from a power source to the light 20 camera 22 and heating unit 21. Referring to Fig. 13, in one aspect of the present invention the laryngoscope 14 is comprised of a motion sensor 134 and processor 136 that allow the laryngoscope 14 to be motion activated such that the laryngoscope 14 is powered on upon a predetermined threshold of movement. In another aspect of the present invention, the laryngoscope 14 is capable of being motion activated such that the laryngoscope 14 is powered off when no movement is detected for a predetermined period of time.

[0033] In Fig. 3, there is shown the connection assembly between the handle 16 and arm 18. At the base of the handle 16 there is a pin 46 and ball spring receptacles 48. The arm 18 is comprised of ball springs 62. To couple the arm 18 to the handle 16, the pin 46 is inserted in arm opening 47. The ball springs 62 slide into ball spring receptacles 48. This connection aligns arm plate 64 with handle plate 50 within the walls 54 of handle plate 50 such that an electrical connection is made with connectors 52.

[0034] Referring to Figs. 1 and 7-9, the display unit 72 is comprised of a thin container 74, a screen 88, a DC Jack 94, a battery management board and a battery. The container 74 is comprised of an IV pole attachment connector 90 such that it may be removably coupled to an IV pole attachment receiver 100 (Fig. 11) or, as shown in Figs. 7 & 9, sit upright on a stand 92 when not attached to the IV pole attachment receiver 100. Referring to Figs. 7-9, the container 74 of the preferred embodiment is generally rectangular and is comprised of a face 76, a back 78, and sides 80. The face 76 of the container 74 partially surrounds the screen 88 so that the screen 88 may be viewed. In the preferred embodiment, the stand 92 is pivotally coupled to the back 78 and is structured and arranged such that it extends generally rearward from the back 78 when in use and folds flat against the back 78 in a recess 86 when in the stored position. In the preferred embodiment, said recess 86 is contoured to the shape of the stand 92.

[0035] Referring to Fig. 14, in one aspect of the present invention the display unit 72 is comprised of a motion sensor 138 and processor 140 that allow the screen 88 to be motion activated such that the screen 88 is powered on upon a predetermined threshold movement. In another aspect of the present invention, the screen 88 is capable of being motion activated such that the screen 88 is powered off when no movement is detected for a predetermined period of time.

[0036] Referring again to **Figs. 7-9**, in one aspect of the present invention, the face **76** has a battery status indicator **84**. This indicator **84** is comprised of a plurality of LED lights. In the preferred embodiment, two green lights showing indicate to the user that the battery is fully charged and the system **12** is operable. An amber light indicates the battery is depleted and will need to be charged soon. A red light indicates the battery lacks sufficient charge to operate the screen **88**, camera **22**, and light **20**. In the preferred embodiment, the indicator **84** is positioned at the lower portion of the face **76** near the center and beneath the screen **88**.

[0037] The back **78**, on the inside, has pegs and receptacles which act as coupling devices. The central pegs of the back correspond with receptacles located on the reverse side of the screen **88**. The perimeter receptacles correspond with pegs located on the inside side of the face **76**.

[0038] The screen **88** and battery are mounted on the inside portion of the back **78** of the container **74**. The battery of the preferred embodiment is a rechargeable lithium battery and is capable of illuminating the screen **88**. The screen **88** of the preferred embodiment is a 3.5 inch (Diagonal) Liquid Crystal Display (LCD). The screen **88** displays the image captured by the camera **22**. In one aspect of the present invention, the screen **88** also displays other information such as the battery charge level, time, date, and the like.

[0039] The display unit **72** is further comprised of a DC input jack **94** and charge indicator **130**. This jack **94** accepts the barrel portion of a charging cable. This jack **94** connects with and is used to recharge the battery. The charge indicator **130** is an LED light that, when lit, alerts the user that the battery is being charged. In one aspect of the present invention, the unit **72** may not be operated while the charge cable is inserted into the jack **94**.

[0040] The cable **62** is capable of communicating images received from the camera **22** to the screen **88** through the communication jack **132**. Referring to **Fig. 15**, in one aspect of the present invention, the laryngoscope **14** is capable of wirelessly communicating with the display unit **72**. In this embodiment, the laryngoscope **14** is further comprised of a transmitter **148**, a processor or CPU **152** and an antenna **150**. The display unit **72** is further comprised of a receiver **142**, a processor or CPU **146** and an antenna **144**. Images captured by the camera **22** are processed by the CPU **152** and transmitted wirelessly to the display unit **72** receiver **142** such that the images are displayed on screen **88**.

[0041] The communication cable **96** is also capable of transmitting power generated by the battery to the light **20** and camera **22**. The battery management board is a conventional and commercially available circuit board and is capable of maintaining an appropriate charge level in the battery.

[0042] The IV pole **128** is conventional and commercially available. As may be seen in **Figs. 1 and 10 - 11**, the IV pole attachment **98** is comprised of an attachment receiver **100**, an IV pole clamp **108** with a C shaped opening, a tightening screw **110** with wing knob **112**, and a

laryngoscope receptacle **114**. The attachment receiver **100** allows the user to quickly attach and separate the display unit **72** from IV pole attachment **98** and is comprised of a bracket **102**, and a quick release button **104**. The attachment connector **90** of the display unit **72** may be slideably attached to the attachment receiver **100**. The user may detach the display unit **72** from the attachment receiver **100** by depressing the release button **104** which activates a lever **106** that disengages the display unit **72** from the attachment receiver **100**. The IV pole attachment **98** may be secured to an IV pole **128** by inserting the pole **128** in the IV clamp's **108** C shape opening and tightening the tightening screw **110** with the wing knob **112**.

[0043] Referring to **Figs. 10 - 11**, the laryngoscope receptacle **114** is comprised of a contoured holder **116** and an extension portion **118**. The extension portion **118** is comprised of a first member **124** and a second member **126**. In the preferred embodiment, the first member **124** is structured and arranged such that it can rotate 360 degrees around an imaginary axis **120** that extends from a longitudinal axis of the extension portion **118**. The second member **126** is structured and arranged such that it can rotate up to 360 degrees around an axis **122** perpendicular to the axis **120** around which the first member **124** rotates. Therefore, as may be seen in **Figs. 10 and 11**, the receptacle **114**, without the need for the user detaching the IV pole attachment **98** from the IV pole **128**, can be positioned on either side of an IV pole **128** and oriented such that the contoured holder **116** remains in an upright position and capable of receiving the laryngoscope **14**.

[0044] The contoured holder **116** is shaped to accommodate the laryngoscope **14** in the folded position as shown in **Fig. 4**.

[0045] In the preferred embodiment the arm **18** is made from stainless steel. The handle **16** and container **74** are made from Acrylonitrile butadiene styrene (ABS). Although the handle **16** and container **74** of the preferred embodiment are formed from ABS, they need not be. For instance, the handle **16** and container **74** may be formed of any conventional material such as metal or

[0046] While there has been illustrated and described what is, at present, considered to be a preferred embodiment of the present invention, it will be understood by those skilled in the art that various changes and modifications may be within the scope of the invention. Therefore, it is intended that this invention not be limited to the particular embodiment disclosed as the best mode contemplated for carrying out the invention, but that the invention will include all embodiments falling within the scope of the claims.

REFERENCES CITED IN THE DESCRIPTION

Cited references

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Patent documents cited in the description

- [WO2007066134A2 \[0007\]](#)

LARYNGOSKOPSYSTEM**PATENTKRAV**

1. Laryngoskop (14), der omfatter et greb (16), en arm (18) og en kappe (24), hvor:
armen (18) omfatter vægge, en lampe (20) og et kamera (22), hvor væggene er struktureret og anbragt således, at lampen (20) og kameraet (22) er indesluttet inden for væggene, og hvor mindst én af væggene er transparent;
armen (18) er koblet til grebet (16), og armen yderligere omfatter en kappeforbindelsesrand (58), der er lokaliseret på armen (18) i et koblingspunkt (68);
kappen (24) er forskydeligt koblet til armen (18), idet kappen omfatter én eller flere hægter (30), der er i stand til samvirkende kobling med kappeforbindelsesranden (58), og idet kappen aftageligt kan kobles til armen (18) i koblingspunktet (68);
grebet omfatter en udkastningskontakt (34), idet udkastningskontakten (34) omfatter en udkastningsstang (38) og en stempelblok (36), der omfatter et fremspring (40);
et fastholdelsesrum (44) er anbragt oven over stempelblokken (36) med henblik på at rumme fremspringet (40) og fastholde udkastningskontakten i en hvileposition;
en returfjeder (42) er koblet til udkastningskontakten med henblik på at fastholde udkastningsstangen (38) i en tilbagetrukket position som en hviletilstand; og
kappen (24) er anbragt med henblik på at kunne fjernudkastes ved at nedtrykke udkastningskontakten (34) på grebet (16) for at frigive en hægte (30) af hægten eller hægterne (30) ved kappeforbindelsesranden (58), som er lokaliseret på armen (18) i koblingspunktet (68).
2. Laryngoskop (14) ifølge krav 1, hvor kappen (24) omfatter en kanal (26), der er i stand til at kunne gevindforbindes med en bougie (70).
3. Laryngoskop (14) ifølge krav 2, hvor kanalen (26) er åben på en langsgående side.

DRAWINGS

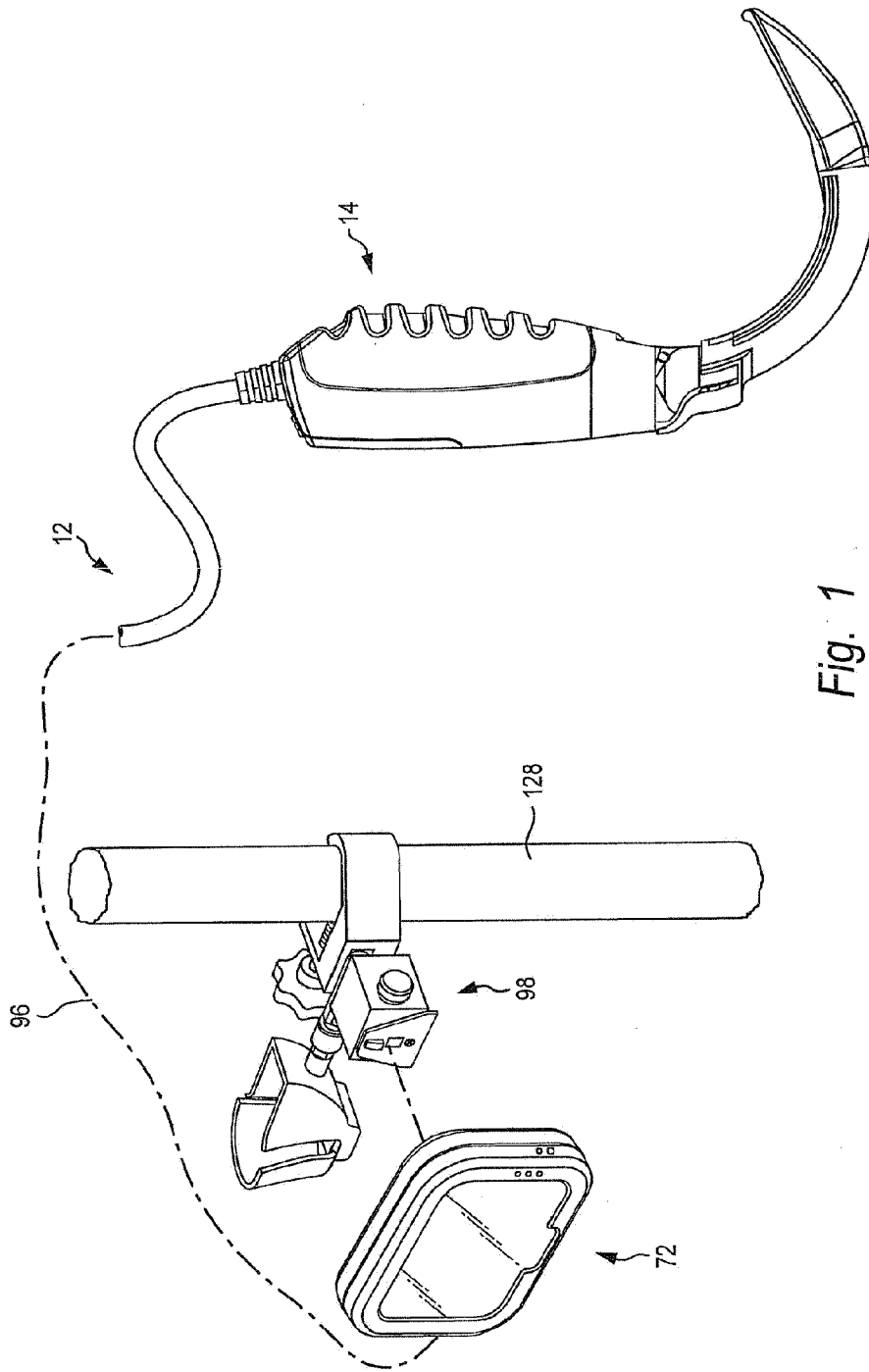


Fig. 1

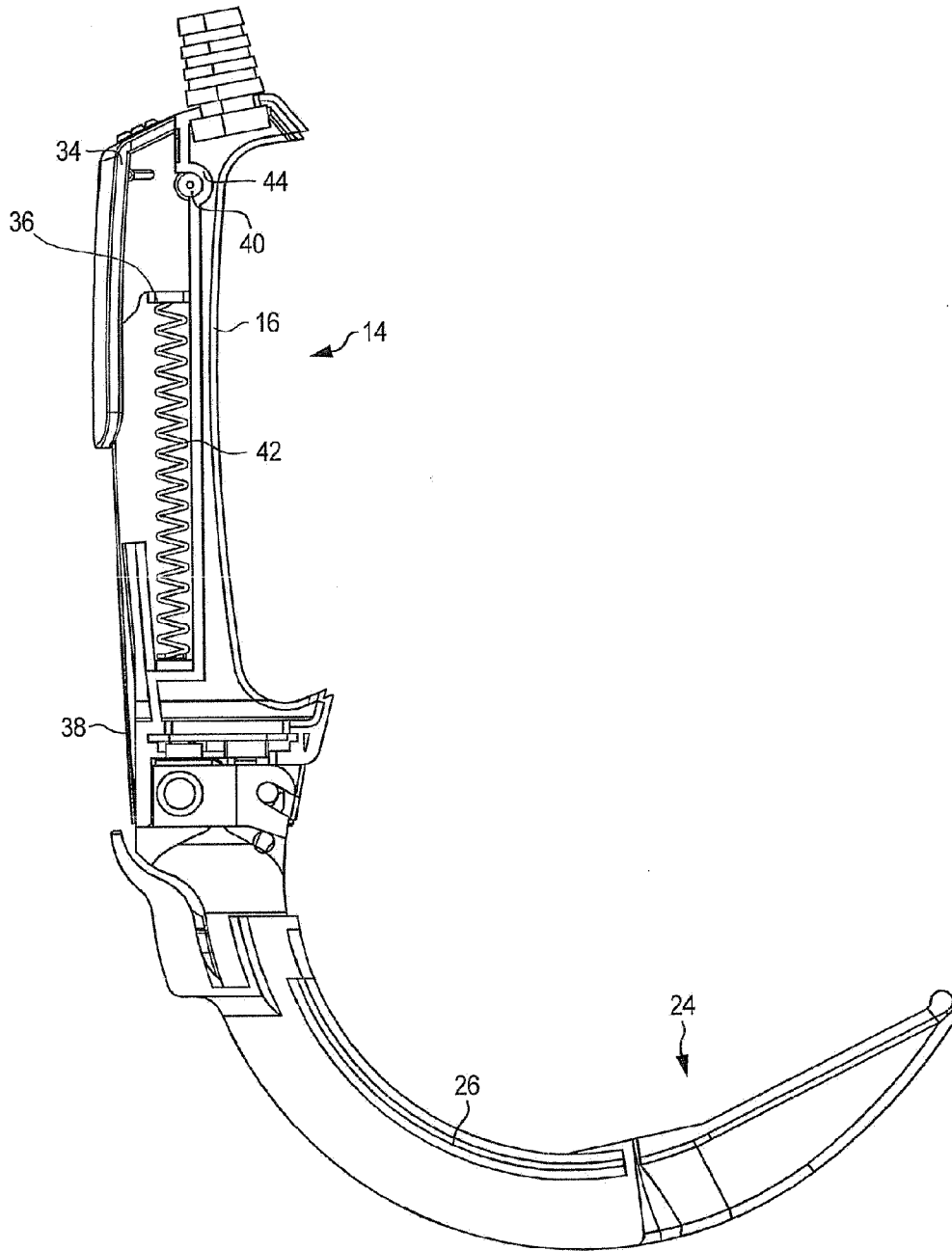


Fig. 2A

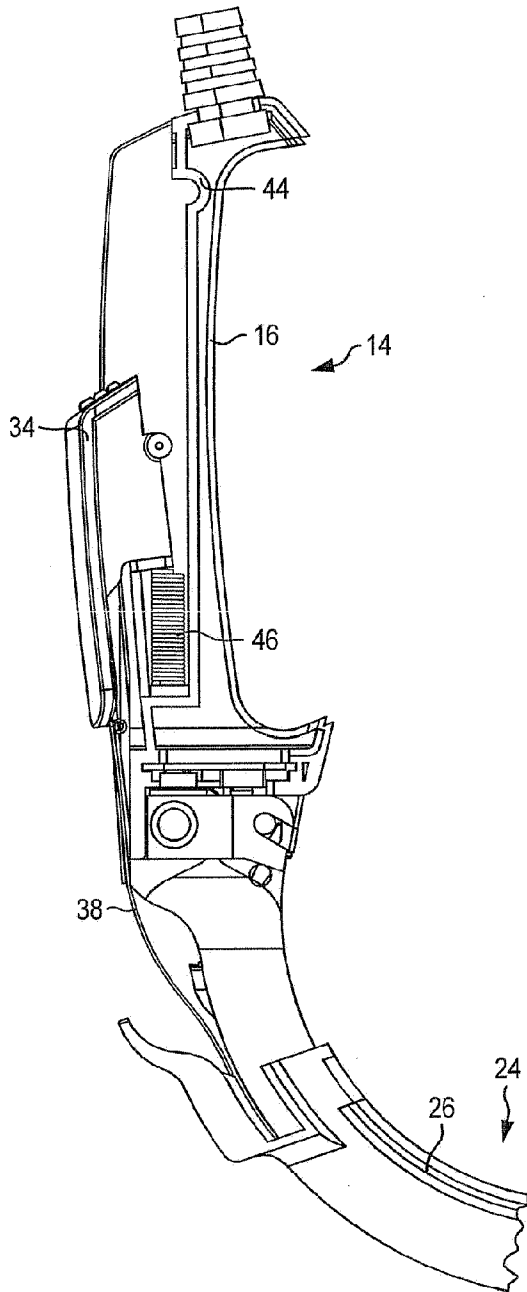


Fig. 2B

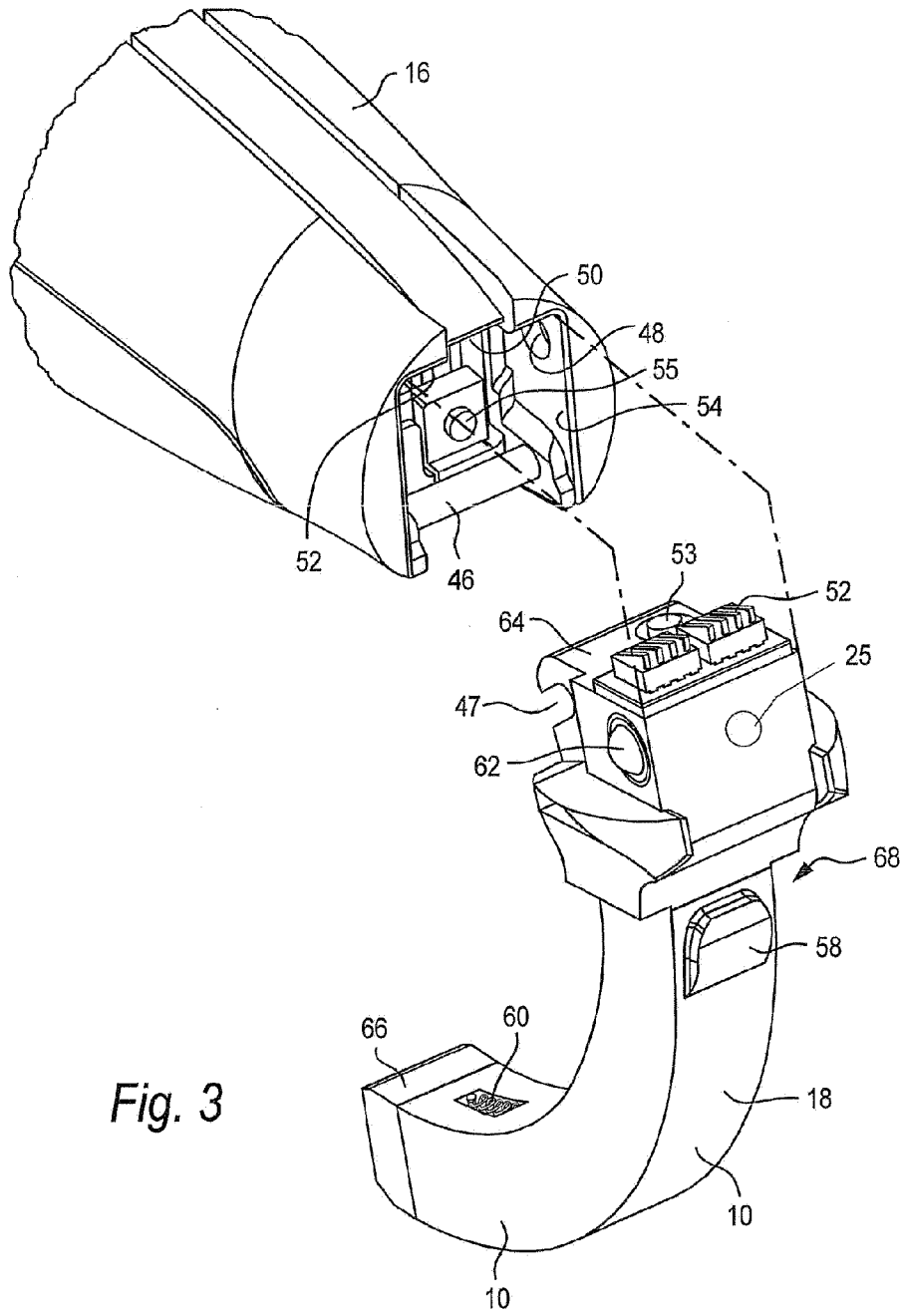


Fig. 3

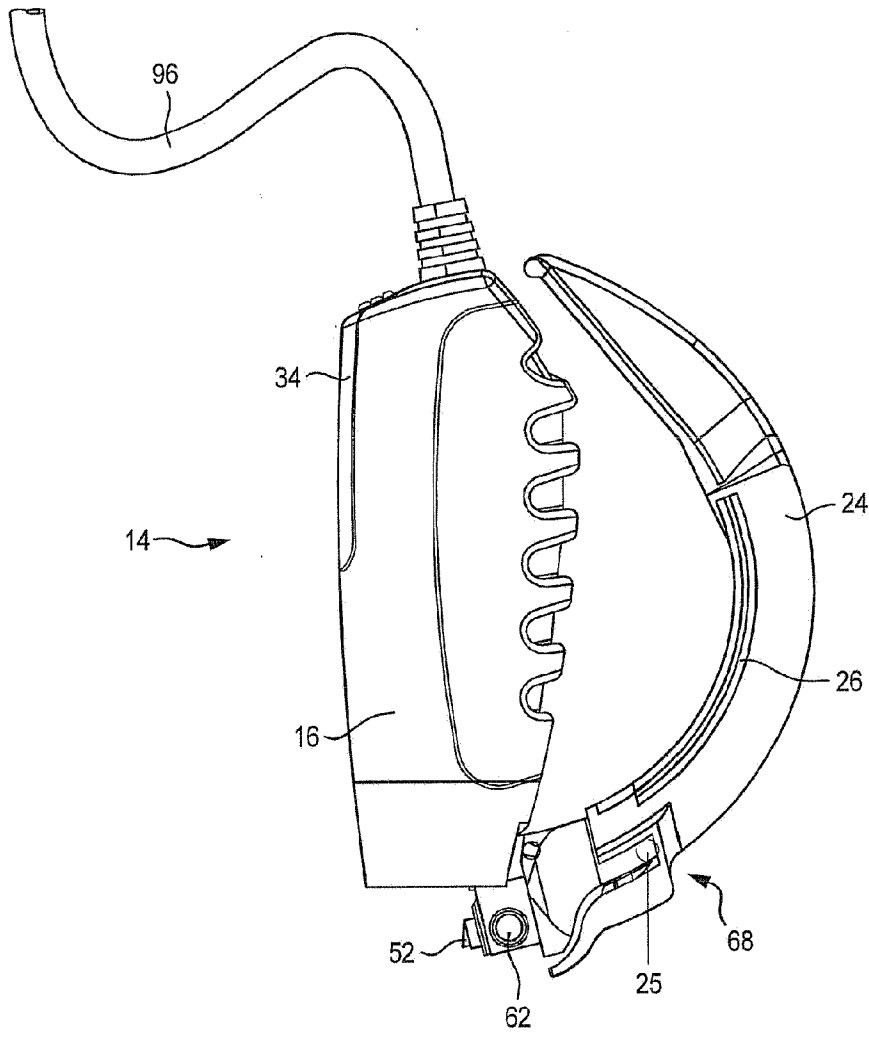


Fig. 4

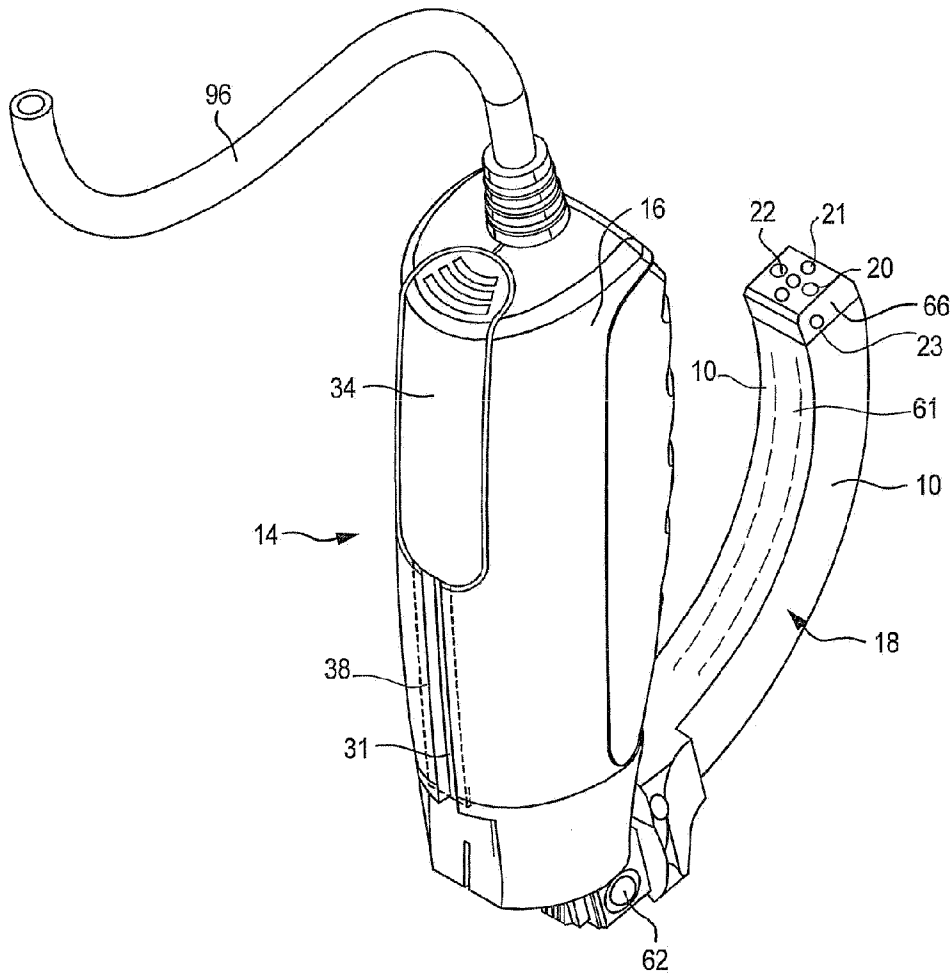


Fig. 5

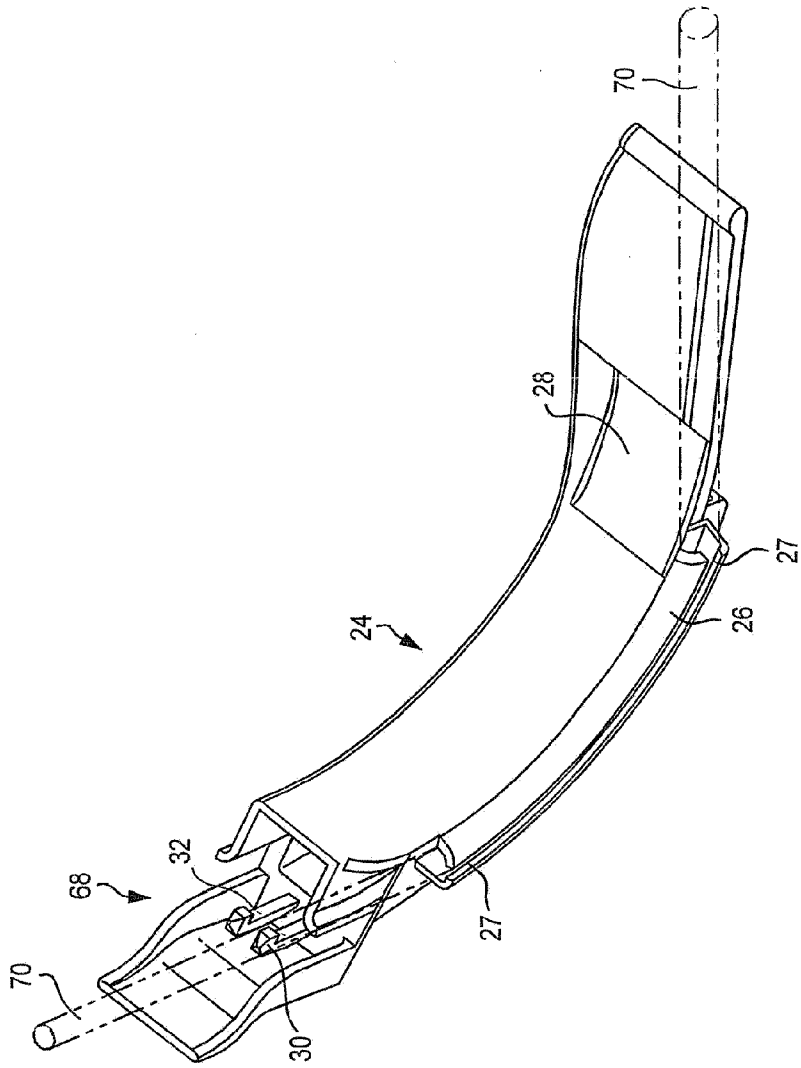


Fig. 6

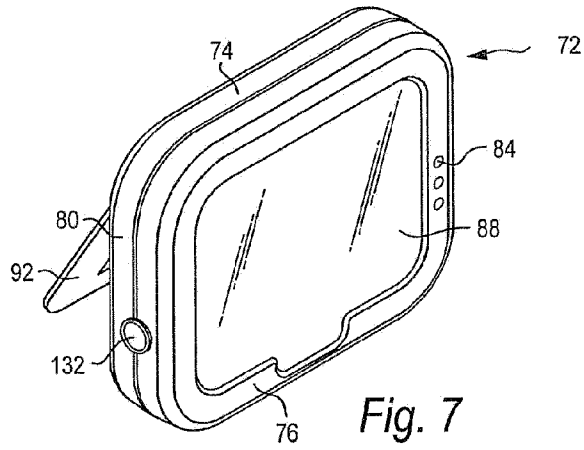


Fig. 7

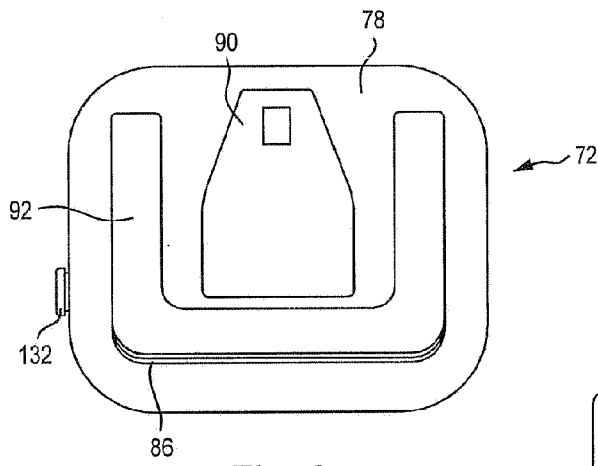


Fig. 8

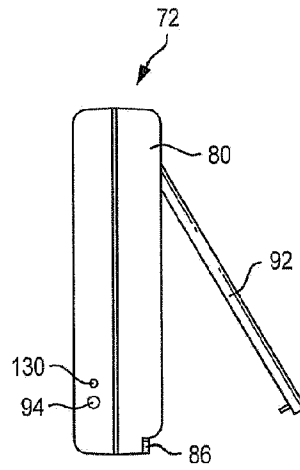


Fig. 9

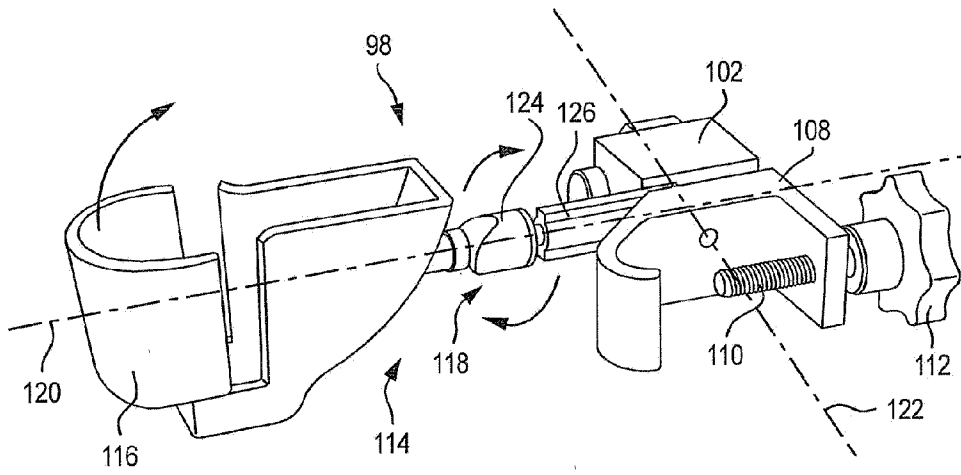


Fig. 10

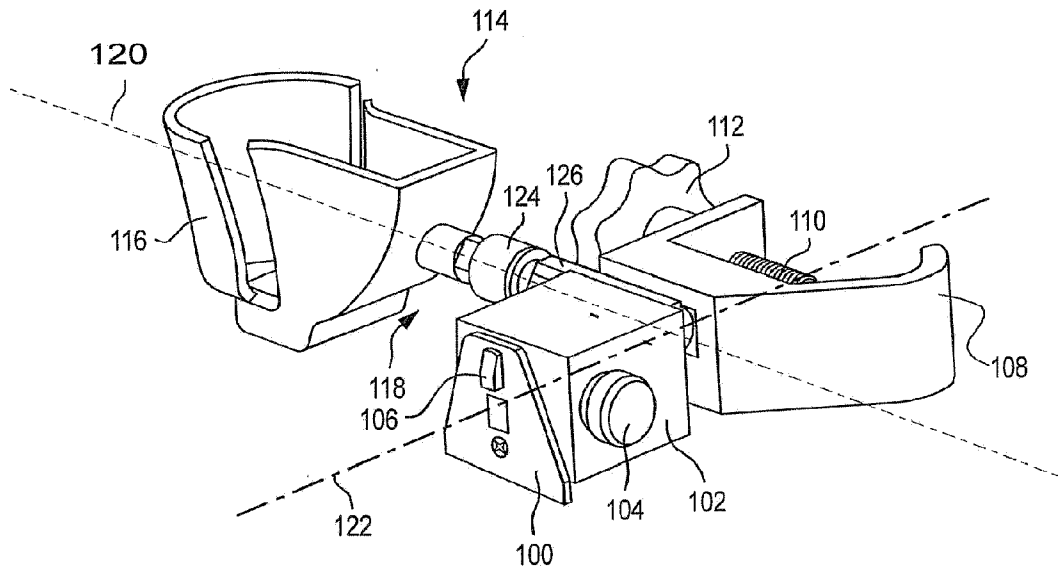


Fig. 11

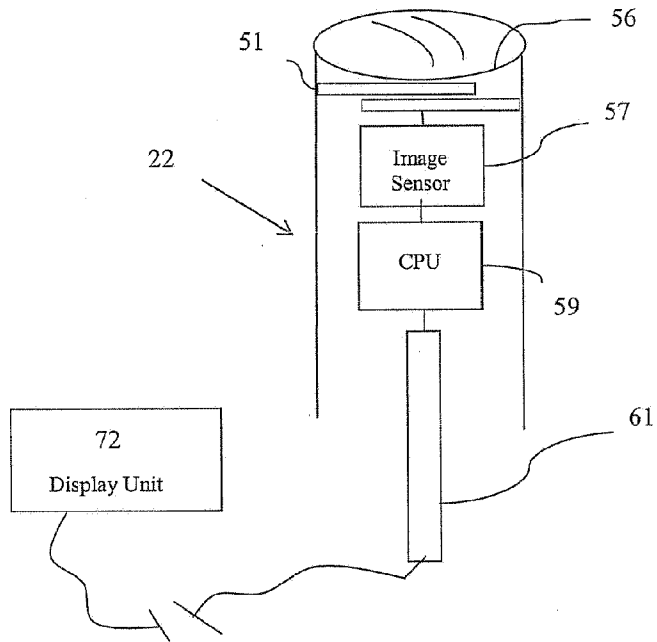


Fig. 12

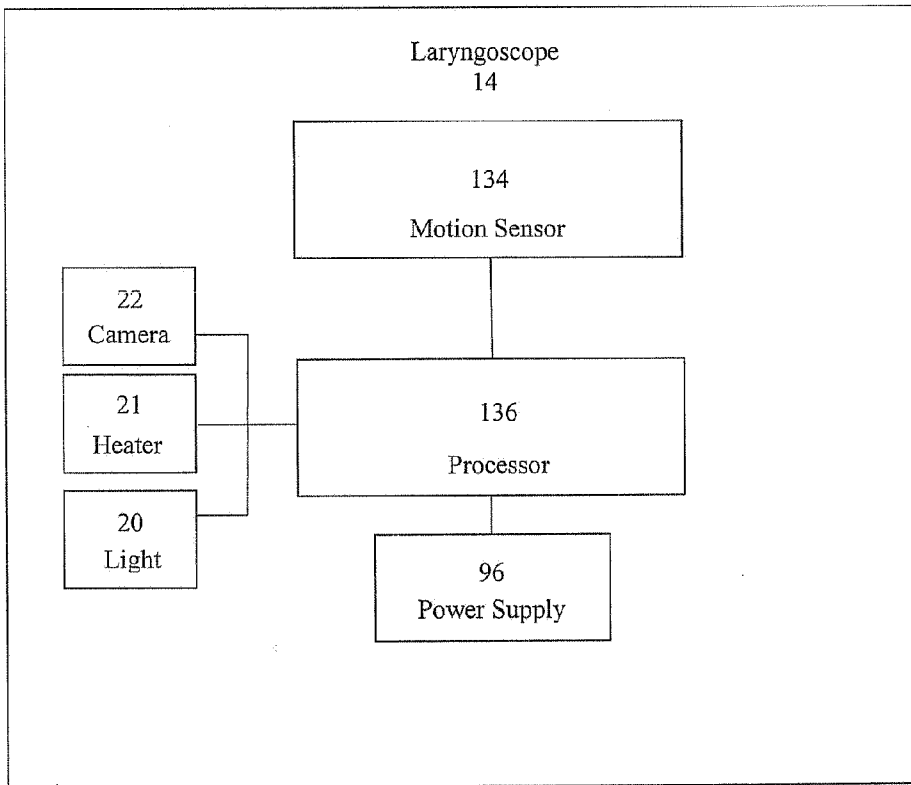


Fig. 13

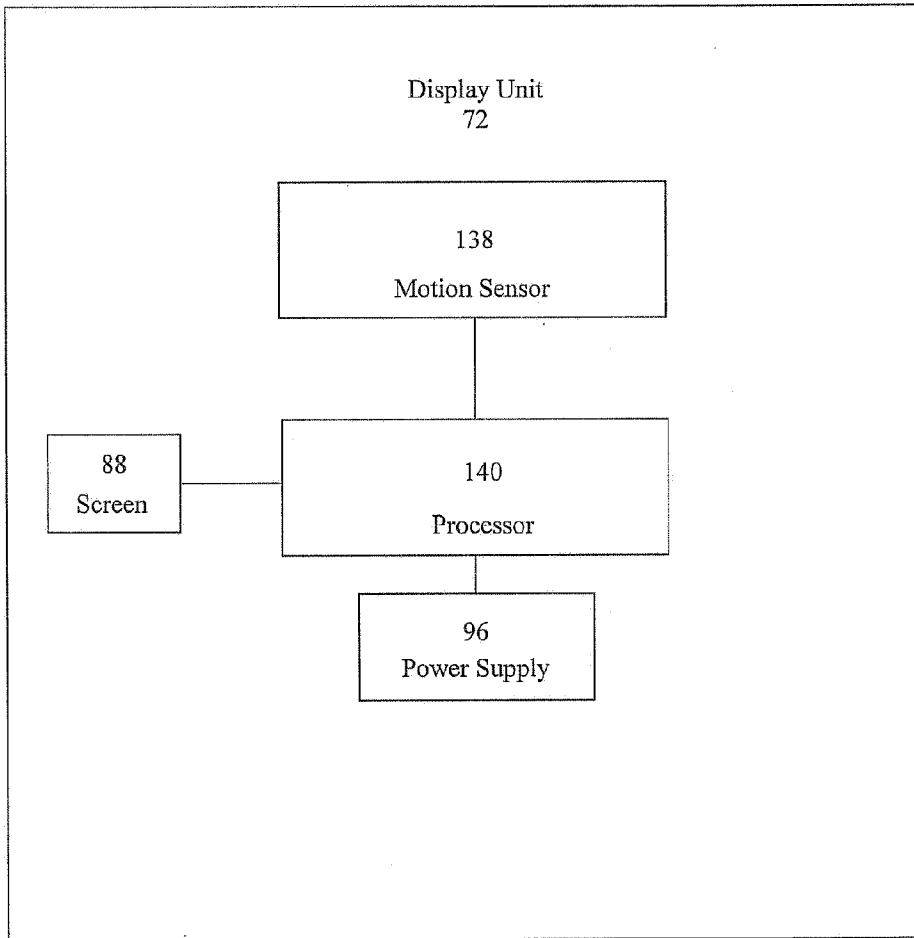


Fig. 14

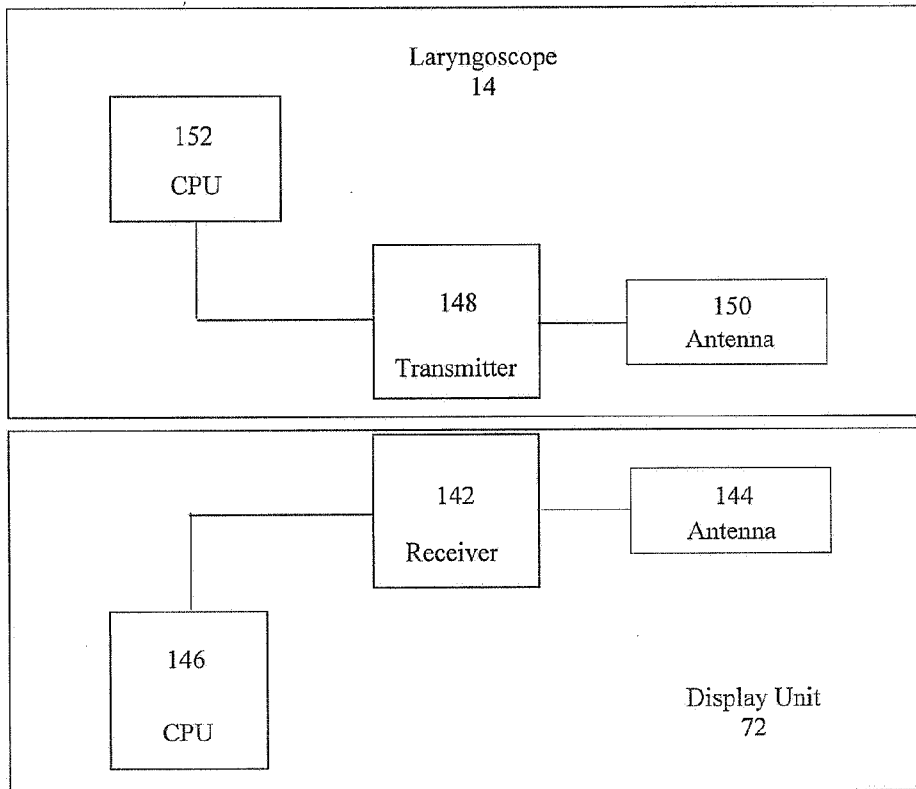


Fig. 15