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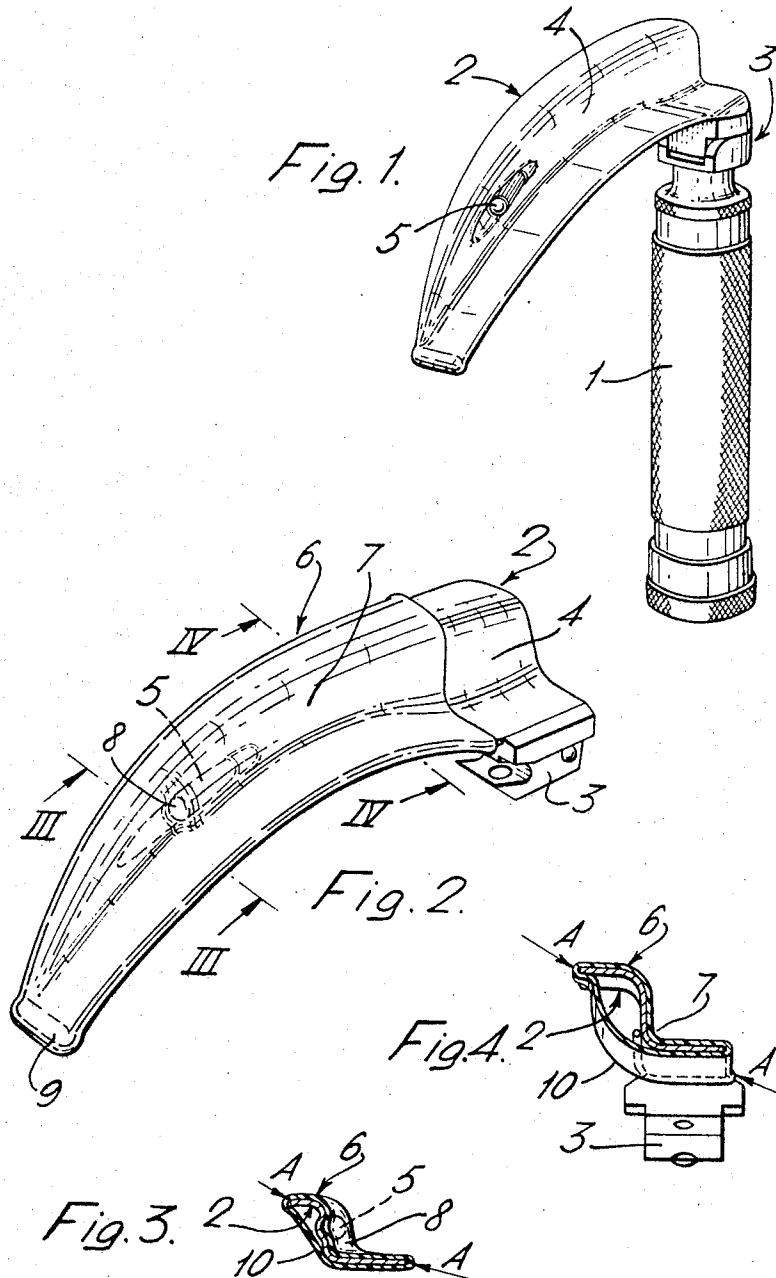
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DISPOSABLE COVER FOR LARYNGOSCOPE BLADE

Filed May 13, 1966

Sheet 1 of 2



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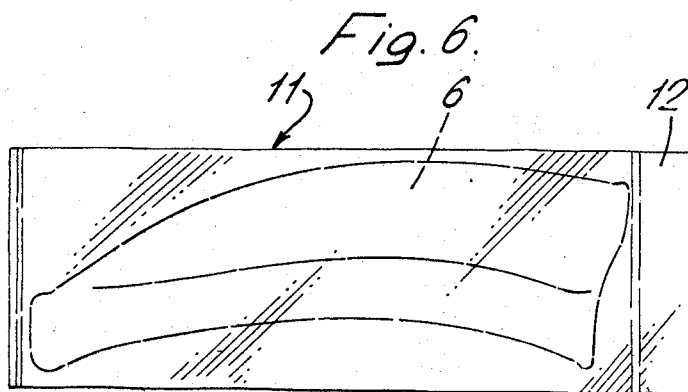
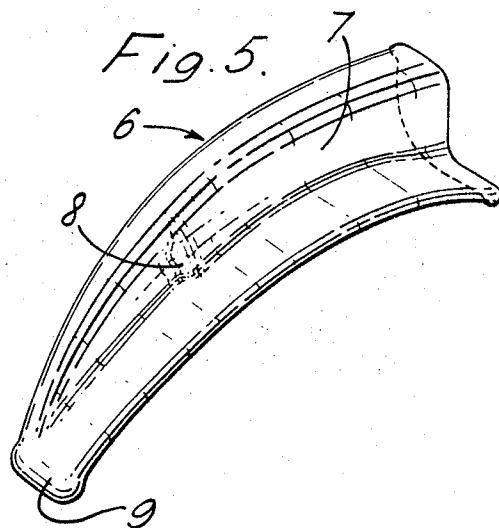
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Sheet 2 of 2



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DISPOSABLE COVER FOR LARYNGOSCOPE BLADE

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5 Claims

ABSTRACT OF THE DISCLOSURE

A sterile, disposable generally tubular cover of plastic for a laryngoscope blade having an intubation channel and a light source in a wall of the channel. The cover is of light transmitting plastic sufficiently rigid to conform closely to the walls of the channel and has a closed end and an open end to receive the blade. A sterile envelope containing the cover has a rupturable portion through which the blade can be inserted into the open end of the cover while still in the envelope.

This invention relates to laryngoscopes. A laryngoscope is a surgical instrument which is most commonly used by an anaesthetist to assist him in the "intubation" of a patient, i.e. the insertion into the larynx of a tube for the passage of anaesthetising gas. This operation is difficult to carry out without the aid of some means for displacing the epiglottis to reveal the larynx while passing the tube; the anaesthetist therefore inserts the metal blade of a laryngoscope to such an extent as to engage the tip of the instrument with the epiglottis or in the epiglottic fold, and then draws the patient's lower jaw forwardly by pulling along the axis of the laryngoscope handle, which is arranged at an angle to the blade. The laryngoscope blade is formed with a longitudinal channel which has two functions in use; firstly to enable the anaesthetist to see along the length of the blade and thus into the larynx and secondly to provide a path for the anaesthetic-carrying tube to be inserted; such channel is usually provided by making the blade substantially of Z-shape or C-shape in transverse cross-section.

Laryngoscopes are also used simply for the examination of a patient's larynx. To facilitate the use of the instrument in either of its modes of employment, a light source is associated with the blade, usually in the form of a screw-fitted electric bulb mounted about half-way down the blade so as to cast its light along the channel formed therein; an electrical lead connects the bulb to a current source, such as a dry battery housed in the laryngoscope handle.

It is, of course, essential that at least the blade of a laryngoscope should be in a sterile condition when it is used, which means that, up to the present, each laryngoscope blade has had to be sterilised, e.g. autoclaved, each time it is used. Such a procedure is, of course, time-consuming and quite costly and it is therefore desirable that some form of disposable device should be provided to replace the commonly-used metal blade, which device can be manufactured and sold sufficiently cheaply, in a sterile form, to make it a good economic proposition even though it is only used once and then discarded. Disposable surgical instruments are frequently made of artificial plastics material, but this is not a good practical proposition in the case of a laryngoscope blade as the latter must be strong enough to transmit the necessary force to draw a patient's lower jaw forwardly in use, as described above, and a blade formed of a sufficiently inexpensive artificial plastics would not have this strength.

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Viewed from one aspect the invention provides a disposable cover for a laryngoscope blade, comprising a sheath formed of a semi-rigid substantially transparent or highly translucent material, such sheath being adapted to enclose at least that part of the blade which will be inserted within a patient's mouth in use, and being shaped to conform to the shape of the blade at least to such an extent that the path defined thereby for the intubation of a patient is not obstructed by the sheath.

Such a sheath will be provided in a sterile condition ready for mounting on the laryngoscope blade which need not then be sterile. It must be formed of such a material, and be of such a thickness, as to withstand the pressure applied to it by a patient's lower teeth when the anaesthetist draws the lower jaw forward; it is envisaged that artificial thermoplastic materials such as cellulose acetate, polystyrene, cellulose acetobutyrate, unplasticised polyvinylchloride, acylo-nitril butadiene styrene (terpolymer), polypropylene and Melinex may all be suitable for the purpose in question. Plastics materials which are cheap enough to be used to make a disposable sheath are not amenable to heat sterilisation, and chemical sterilisation will not general be sufficiently reliable. It is therefore desirable that, when the sheath is formed from an artificial plastics material, this should be one which is suitable for sterilisation by irradiation.

As supplied for use, the sheath will preferably have its external surface coated with a non-toxic lubricant, such as a suitable mineral jelly.

It is, of course, important that the material of the sheath should be substantially transparent or highly translucent as it will necessarily enclose the light source associated with the laryngoscope blade, and the light therefrom must still pass through the sheath to illuminate the patient's larynx. Preferably that part of the sheath which is positioned to extend, in use, across the beam from such light source will be steeply angled relative to the intended direction of the beam so as to obstruct it as little as possible.

So long as the sheath conforms to the shape of the laryngoscope blade to such an extent as not to obstruct the path defined by the latter for the passage of an anaesthetic-carrying tube, its conformity to the shape of the other parts of the blade is not vital, although obviously it would be undesirable for the sheath to have any projections thereon which might harm the patient. Clearly a sheath formed of flexible material, such as natural or synthetic rubber, could not be employed as it would stretch across such path and obstruct the same.

The sheath may be secured to the laryngoscope in any of a number of ways. Thus for example it could simply be secured to the heel of the blade by a piece of adhesive tape. Alternatively it could be provided with one or more integral claws adapted to snap over the heel of the blade. Again, where the laryngoscope blade is curved the sheath could be formed with a curvature either slightly less or slightly greater than that of the blade so that when drawn on to the blade the sheath will be flexed out of its normal shape and thus engage the blade frictionally. In a preferred form of the invention the sheath is made very slightly narrower over at least part of its length than the blade which it is intended to cover, so as to be a sufficiently tight friction fit thereon.

The sheath may be formed by any convenient and well-known process, such as by dip-moulding from liquid or powdered material or by vacuum forming from sheet and subsequent welding.

The sheath will usually be provided in a sterile condition in an internally sterile pack and thus, viewed from another aspect, the invention provides an internally sterile gas-tightly sealed pack containing a disposable cover for

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a laryngoscope blade, such cover comprising a sheath formed of a semi-rigid substantially transparent or highly translucent material, such sheath being adapted to enclose at least that part of the blade which will be inserted within a patient's mouth in use, and being shaped to conform to the shape of the blade at least to such an extent that the path defined thereby for the intubation of a patient is not obstructed by the sheath.

Preferably the said pack will be of elongate shape and be of such a width as to prevent end-to-end rotation of the said sheath therein, the pack being so formed as to facilitate its being opened at the end thereof adjacent the open end of said sheath and the subsequent mounting of the sheath on a laryngoscope blade before its removal from the pack.

Such a packing arrangement will ensure that, when the user opens the pack, the rearward and open end of the sheath will be presented for engagement on the laryngoscope blade; the sheath can when be mounted on the blade without removing it from the pack and the pack subsequently withdrawn so that the sheath is never touched by the hands and its sterile condition is thus maintained.

The said pack will preferably be formed of an artificial plastics sheet material suitable for sterilisation by irradiation, such as one of those materials previously mentioned. It is then possible to seal the sheath in the pack and subsequently to subject the complete article to radiation so as to sterilise both the sheath and the interior of the pack at the same time.

In order that the invention may be more readily understood, embodiments of the same in both of its aspects referred to above will now be described by way of example and with reference to the accompanying drawings, in which:

FIGURE 1 is a perspective view of a laryngoscope, showing the blade and its handle;

FIGURE 2 is a perspective view of such a laryngoscope blade with a disposable cover according to the invention mounted thereon;

FIGURES 3 and 4 are transverse cross-sections on the lines III—III and IV—IV of FIG. 2, respectively;

FIGURE 5 is a further perspective view of the disposable cover of FIGS. 2 to 4; and

FIGURE 6 is a plan view of a pack containing such a disposable cover.

Referring first to FIG. 1 it will be seen that the laryngoscope comprises a handle 1 and a curved stainless steel blade 2 extending substantially at right angles to the handle. The blade is detachably secured to the handle by a claw-type fitting 3 and is formed to define a longitudinal right-angled channel 4 to enable a practitioner to see along the length of the blade and thus into a patient's larynx and also to provide a passage for intubation. The blade carries an electric bulb 5 in the angle of the channel 4, positioned to illuminate such channel and connected to a battery housed in the handle 1.

It should be clearly understood that the particular form of laryngoscope blade illustrated in the drawings is only one example of a considerable number of differently shaped blades which are commonly available for use in various different circumstances, and that the present invention extends to the provision of disposable covers for all forms of laryngoscope blade and not only to that which is illustrated.

Referring now to FIGS. 2 to 5 the disposable cover for the laryngoscope blade, formed in accordance with the invention, comprises a semi-rigid sheath 6 of substantially transparent polyvinyl chloride open at one end to enable it to be mounted on the blade 2. The sheath is formed to define a longitudinal right-angled channel 7 shaped to fit within and conform closely to the shape of the channel 4 in the blade and thus not to obstruct the latter channel. In front of the electric bulb 5 in the blade, the wall of the sheath is formed with a shouldered

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portion 8 through which the light beam will pass in use; such portion 8 of the sheath is arranged to lie nearly at right angles to such beam and thus to obstruct or disperse the latter as little as possible.

The sheath is formed with a bulbous end portion 9 to fit over the similarly shaped tip of the blade 2, which will be inserted in a patient's epiglottic fold in use.

The underside 10 of the sheath 6 is not shaped to conform accurately to the configuration of the underside of the blade 2, as may be seen from FIGS. 3 and 4. As previously explained, it is sufficient that the sheath should conform to the shape of the channel 4 on the top side of the blade so as not to obstruct the same.

The sheath 6 is formed by dip moulding and is dimensioned to have a natural internal width, as measured in the direction A—A indicated in FIGS. 3 and 4, which is very slightly less than the corresponding external width of the blade 2, so as to be a sufficiently tight frictional fit thereon as to be securely positioned in use but not to give rise to difficulty in inserting the blade in the sheath. The presence of the enlarged bead at the tip of the blade 2 also helps to hold the sheath thereon.

The sheath is thick enough to give it sufficient strength, particularly on its underside, to withstand the pressure of a patient's lower teeth thereon when the blade of the laryngoscope is used to draw the lower jaw downwardly in use.

Referring now to FIG. 6, this shows a pack 11 containing a sheath 6 of the kind illustrated in FIGS. 2 to 5.

The pack 11 is formed of polyvinyl chloride sheet and comprises a rectangular envelope one end 12 of which is formed to be easily removable to expose the open end of the sheath therein. The pack 11 is gas-tightly sealed and both it and the enclosed sheath have been sterilised by an irradiation process after such sealing.

It will be observed that the pack 11 is sufficiently narrow to prevent the sheath 6 from turning around end-to-end during handling prior to use. The open end of the sheath will thus be maintained adjacent the openable end 12 of the pack. As a result, when the pack is opened the blade of a laryngoscope may be inserted fully into the sheath before the latter is withdrawn from the pack; the external surface of the sheath need not, therefore, be touched other than by the sterile interior of the pack before it is used.

It will thus be seen that the invention provides an inexpensive and efficient device whereby the repeated sterilisation of a laryngoscope blade may be avoided and a sterile instrument provided for each successive use thereof; it is anticipated that the cost of a sheath according to the invention will be less than that of autoclaving the laryngoscope blade itself.

I claim:

1. A disposable cover for a laryngoscope blade having at least one longitudinal channel extending therealong, said cover comprising: a sheath of semi-rigid light transmitting material having a closed end and an open end adapted to frictionally receive said blade; at least one side of said sheath being formed to a self sustaining channel shape adapted to nest in said longitudinal channel in said blade and thereby provide an unobstructed intubation path along said channel.

2. A disposable cover as defined in claim 1 wherein said semi-rigid material is a synthetic plastic suitable for sterilisation by irradiation.

3. A disposable cover as defined in claim 1 wherein a portion of a wall of said self-sustaining channel extends generally transverse to the axis of said channel to minimize obstruction of light emanating from a light source in a wall of said longitudinal channel of said blade.

4. A disposable cover as defined in claim 1 including a sterile gas-tightly sealed envelope enclosing said sheath; said envelope having a rupturable end portion adjacent the open end of said cover whereby said end may be rup-

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tured and said cover applied to said blade without removing said cover from said envelope.

5. A disposable cover as defined in claim 4 wherein said envelope is formed of a synthetic plastic material suitable for sterilization by irradiation.

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