

[54] CUTTING AND DIALATING SURGICAL
DEVICE

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[58] Field of Search 128/305, 318, 20,
128/329; 30/233 X, 363 X, 246, 253

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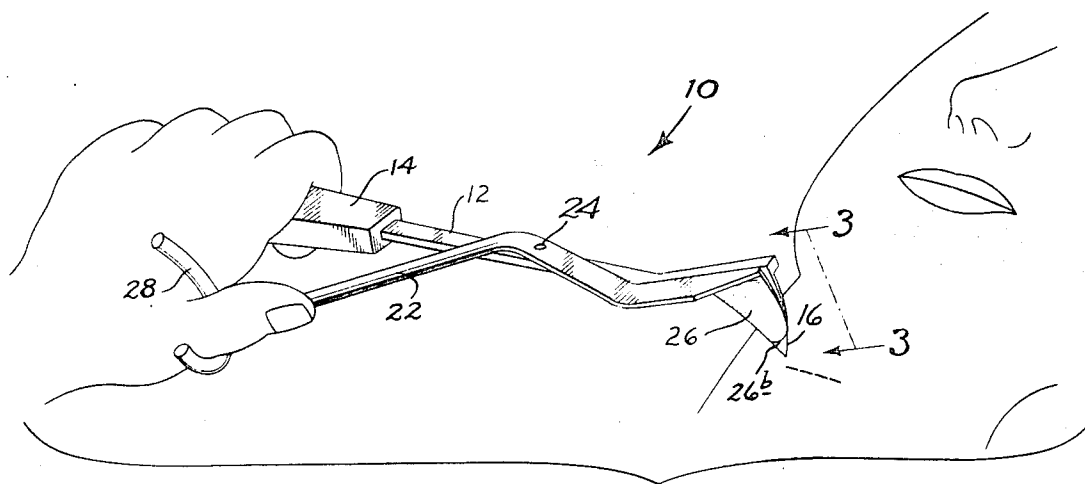
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[57] ABSTRACT

A surgical device, such as may be used in performing emergency tracheotomies, including an elongate handle and an arm pivotally connected thereto intermediate its ends. The arm and handle have a pair of adjacent ends which move toward and away from each other on relative swinging of the arm and handle about their pivot connection. A first blade is secured to one of the adjacent ends and a second blade is secured to the other. The first blade has a sharpened end spaced outwardly from the handle and sharpened, opposed, diverging edges extending from the sharpened end toward the handle. The second blade is adapted to rest in face-to-face contact with the first blade when the adjacent ends of the arm and handle are moved together. The blades when in this position define an integral cutting element. The other ends of the arm and handle include portions which may be gripped by an operator and squeezed toward each other, with such urging the two blades to move apart and spread the edges of a cut made by the integral cutting element formed by the two blades.

8 Claims, 3 Drawing Figures



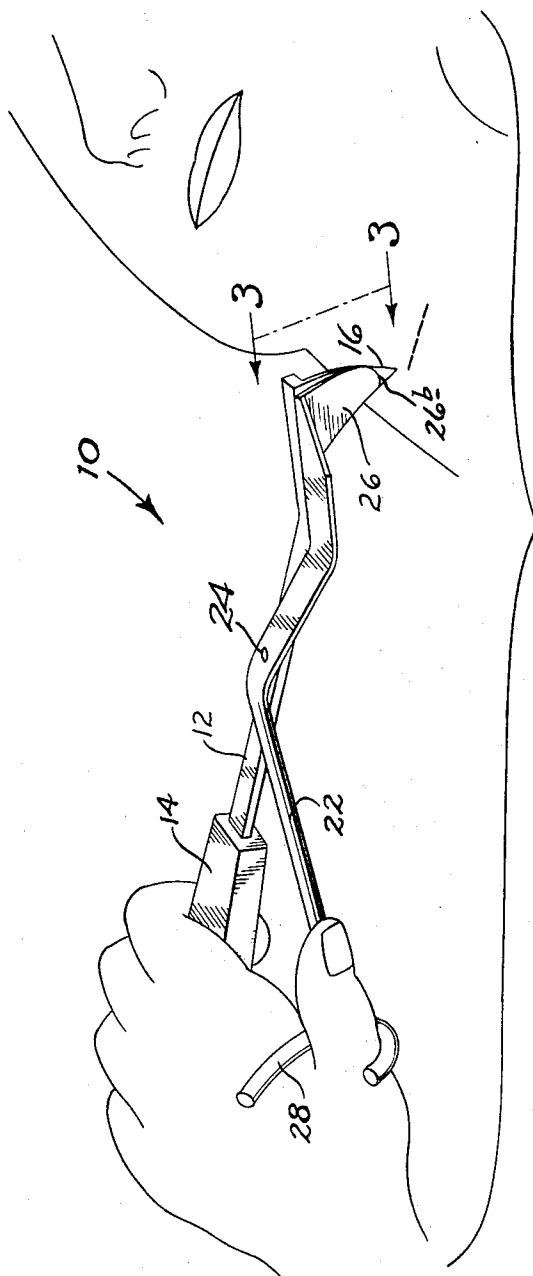


Fig. 1.

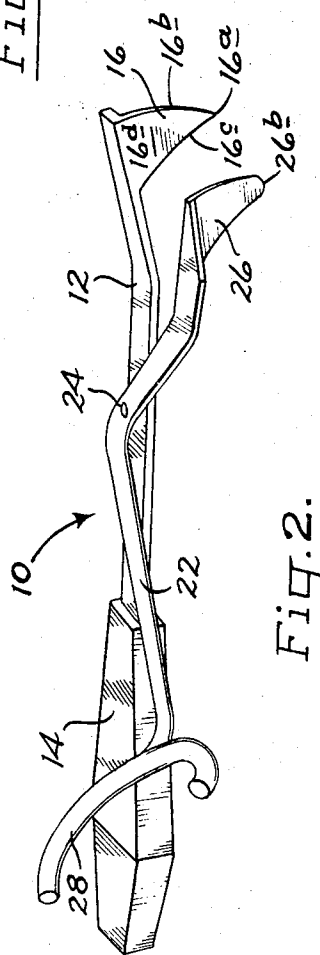


Fig. 2.

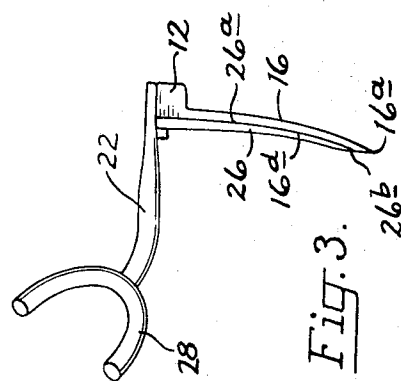


Fig. 3.

CUTTING AND DIALATING SURGICAL DEVICE

This invention relates to a surgical device, and more particularly to such device which is operable to produce a cut and then spread the edges of the cut.

In the performance of certain surgical procedures, it is desirable to be able quickly to produce a cut in tissue and immediately thereafter to spread the edges of the cut apart. An example of a procedure wherein such is desirable is in the performance of emergency tracheotomies wherein a patient's life may depend on an air passage being opened into the patient's trachea in the throat region. In the performance of such an operation, an opening must be cut through the frontal portion of the trachea, the edges of the opening spread, and a tube passed therethrough to maintain an air passage into the trachea. Such an operation may be required in the event of coronary attacks or other situations in which a person's normal breathing is impeded. In such an instance the emergency opening must be provided in the shortest time possible, since oxygen deprivation for even a very short time may cause considerable physical damage.

A general object of the invention therefore, is to provide a surgical device which is operable quickly to produce a cut through tissue and to spread apart the edges of a cut thus produced.

More specifically an object is to provide such a surgical device which includes a pair of separable blades which may be placed in face-to-face contact, and when in such position form an integral cutting element with no abrupt edges along opposite faces of the element. The device also includes means connected to the blades for manually forcing the blades apart so that when the blades are in face-to-face contact they may be pushed through tissue to produce a cut and thereafter forced away from each other to separate the edges of the cut.

These and other objects and advantages will become more fully apparent as the following description is read in conjunction with the drawings, wherein:

FIG. 1 is a perspective view of a surgical device according to the invention held in operative position with a pair of blades thereon in face-to-face contact;

FIG. 2 is a view similar to FIG. 1 with the blades spaced apart; and

FIG. 3 is an end view of the device taken generally along the line 3-3 in FIG. 1.

Referring now to the drawings and first more specifically to FIGS. 1 and 2, at 10 is indicated generally a device constructed according to an embodiment of the invention. The device includes an elongated handle 12, having a hand grip portion 14 adjacent one of its ends and a blade 16 secured to its other end. The hand grip end of the handle is referred to herein as its manipulatable end and its blade end is referred to as its operating end.

Describing blade 16, and referring to FIGS. 2 and 3, the blade is secured to and extends outwardly at a substantial angle from handle 12. As is best seen in FIG. 2, the blade has a sharpened end, or point, 16a, and a pair of opposed sharpened edges, 16b, 16c, which diverge as they extend toward handle 12 from point 16a. As is best seen in FIG. 3, blade 16 is curved when viewed from an edge along a line paralleling handle 12, with face profile 16d of the blade being concave.

Referring again to FIGS. 1 and 2, an elongated arm 22 is pivotally connected intermediate its ends at 24 to handle 12. Arm 22 is curved, whereby both of its ends are positioned to the same side of handle 12.

Secured to one end (the operating end) of arm 22, adjacent blade 16, is a second blade 26 which is slightly smaller than blade 16. Blade 26 is arcuate also, having a face 26a that substantially conforms to the concave configuration of face 16d of blade 16. The outer end 26b of blade 26 is rounded and beveled. Blades 16 and 26 may be placed in face-to-face contact, as shown in FIGS. 1 and 3, with blade 26 resting within the region of concavity of blade 16. With the two blades thus resting in contiguous face-to-face relation, they define an integral cutting element, the opposite faces of which are substantially continuous, with no abrupt edges along either of its opposed faces. The depth of cut to be produced dictates the length of blades 16, 26. For example, if the device is to be used for tracheotomies, the blades should be long enough to cut into the front of the trachea, but not so long that they will puncture the back side of the trachea.

A stirrup element 28 is secured to the opposite end (the manipulatable end) of arm 12 adjacent hand grip 14.

Operation of the device will be explained with regard to FIG. 1. As is shown in FIG. 1, hand grip 14 of the handle is cradled in the fingers of an operator's hand and the thumb of the operator's same hand is cradled in stirrup 28. Handle 12 and arm 22 are swung relative to each other about their pivot connection to places blades 16, 26 in contiguous face-to-face relationship, in what is referred to herein as a closed position. The blades are positioned over the proper portion of a patient's throat 30 through which an incision is to be made, with the point of blade 16 against the throat. The operator uses his other hand to force the blades through the front portion of the throat to produce a cut therethrough. Then by squeezing hand grip 14 and stirrup 28 toward each other handle 12 and arm 22 are swung relative to each other about their pivot connection to force blades 16, 26 apart. As the blades are forced apart they separate the edges of the cut to form an opening into the trachea through which a tube may be inserted to provide air for the patient.

From the above it should be obvious that the device is operable swiftly to produce a clean cut into the trachea and provide an opening through which a tube may be inserted for providing air to the patient. Since blades 16, 26 when in their face-to-face relationship form an integral cutting element having no abrupt edges on either of its faces, the cut produced is clean and even with minimal tearing of adjacent tissue.

While a preferred embodiment of the invention has been disclosed herein, it should be obvious to those skilled in the art that variations and modifications are possible without departing from the spirit of the invention.

It is claimed and desired to secure by Letters Patent: 1. A surgical device for producing a cut and spreading the edges of the cut apart comprising

an elongate handle and an elongate arm pivotally inter-connected and having a set of operating ends swingable toward and away from each other upon movement of the other set of ends thereof in an opposite direction,

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a first blade secured to said handle at the operating end thereof, projecting outwardly at a substantial angle therefrom and having a sharpened end spaced outwardly from the handle, and

a second blade connected to said arm at the operating end thereof and projecting outwardly at a substantial angle therefrom in the same direction as said first blade, said second blade being constructed to rest in face-to-face relationship with said first blade with said operating ends swung toward each other and having a face profile lying within the face profile of said first blade when resting in face-to-face relationship with said first blade, said first blade and second blade being so positioned on the handle and arm respectively that they are moved laterally away from each other on swinging of the operating ends away from each other.

2. The device of claim 1, wherein said first blade has a concave face directed toward the second blade, and said second blade has matching convexity and fits within said concave face.

3. The device of claim 1, wherein said first blade extends laterally of said handle with its sharpened end projecting laterally of said handle, said blade has a concave contour when viewed along a line substantially paralleling the longitudinal axis of the handle, and said second blade is constructed to fit within the region of said concavity.

4. The device of claim 1, wherein said second blade is shorter than said first blade and has a rounded end spaced outwardly from the arm.

5. A surgical device for producing a cut and spreading the edges of the cut apart comprising
an elongate handle,
an elongate arm,
means pivotally interconnecting the handle and arm at a region intermediate the ends of each,
said handle and arm having a set of operating ends

swingable toward and away from each other and a set of manipulatable ends opposite said operating ends, the manipulatable end and operating end of said arm projecting outwardly of the same side of said handle, whereby swinging of the said manipulatable ends together swings said operating ends apart,

a first blade secured to said handle at the operating end thereof and projecting at a substantial angle outwardly therefrom and having a sharpened end spaced outwardly from the handle, and

a second blade connected to said arm at the operating end thereof and projecting outwardly at a substantial angle therefrom in the same direction as said first blade, said second blade being shorter than said first blade and constructed to rest in face-to-face relationship with said first blade with said operating ends swung toward each other.

6. The device of claim 5, wherein said handle includes a portion at its manipulatable end which may be cradled in the fingers of an operator's hand, and a stirrup is secured to the manipulatable end of the arm for cradling an operator's thumb.

7. The device of claim 5, wherein said operating ends may be swung toward each other to place the first and second blades in face-to-face relationship, said first blade has a concave face directed toward the second blade, and said second blade has a matching convexity and fits within said concave face when the blades are in face-to-face relation to form an integral cutting member opposite face surfaces of which are substantially continuous.

8. The device of claim 5, wherein said first blade further comprises opposed sharpened edges extending from said sharpened end toward said handle, which edges diverge on progressing from the sharpened end toward the handle.

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