CLAIMS

1. A device for incision and insertion of a ventilation tube, the device comprising:

a cutter member configured to make an incision;

a holder member configured to dispose the ventilation tube in an orientation in which a longitudinal axis of the ventilation tube is substantially perpendicular to the cutter element; and

a pusher member configured to apply a pushing force to a first end of the ventilation tube in a direction substantially perpendicular to the longitudinal axis, the first end of the ventilation tube being disposed closer to the blade than a second end of the ventilation tube;

wherein the holder member comprises a pivot element configured to releasably engage the second end of the ventilation tube such that the ventilation tube is pivotable about the pivot element under the pushing force applied to the first end of the ventilation tube by the pusher member, for insertion of the first end of the ventilation tube into the incision.

2. The device of claim 1, further comprising a shaft assembly comprising a first shaft member coupled to the holder member, and a second shaft member coupled to the pusher member, wherein the first and second shaft members are moveable relative to each other.

3. The device of claim 2, wherein the first shaft member is further coupled to the cutter member.

4. The device of claim 3, wherein the first shaft member is coupled to the cutter member such that the first shaft member is disposed in a plane of the cutter member.

5. The device of claim 3, wherein first shaft member is coupled to the cutter member such that the first shaft member is disposed at a non-zero angle relative to a plane of the cutter member.

6. The device of claim 3, wherein the first shaft member comprises a curved tip element coupled to the cutter member.

7. The device of claim 2, wherein the shaft assembly further comprises a third shaft member coupled to the cutter member moveable relative to the first and second shaft members.

8. The device of claim 7, wherein the third shaft member is configured to be retractable in a direction away from the incision prior to the pusher member applying the pushing force to the first end of the ventilation tube.

9. The device of any one of the preceding claims, wherein the cutter member comprises one of a group consisting of a straight cutter, a tilted cutter, a crescentic cutter, a two-step/multi-step cutter, a horizontal cutter, and a bevel cutter.

10. The device of any one of the preceding claims, wherein the pivot element comprises a hook.

11. The device of claim 10, wherein the hook comprises a chamfered tip or curved thin strands.

12. The device of any one of the preceding claims, wherein the pusher member comprises one of a group consisting of a solid pusher with a tip having desired curvature, a pusher rod with a head element having a width larger than the pusher rod, a hollow pusher rod, a pusher rod with a long slope tip element, and a pusher rod with curved tip element.

13. The device of any one of the preceding claims, further comprising a sensor member for sensing a proximity of the cutter member to a membrane on which the incision is to be made.

14. The device of claim 13, wherein the sensor member comprises a pressure sensor coupled to the cutter member.

15. The device of claims 13 or 14, wherein the sensor member comprises a first deflection element configured to protrude the cutter member in a direction towards the membrane and to deflect upon contact with the membrane.

16. The device of claim 15, wherein the first deflection element comprises a hair-like structure or fiber.

17. The device of any one of the preceding claims, further comprising a detector member for detecting a depth of the incision.

18. The device of claim 17, wherein the detector member comprises one or more markers on the cutter member.

19. The device of claims 17 or 18, wherein the detector member comprises a second deflection element configured to protrude the cutter member in a sideways direction and to deflect upon contact with the membrane.

20. The device of claim 19, wherein the second deflection element comprises a hair-like structure or fiber or a pair of hair-like structures or fibers configured to protrude the cutter member in opposing sideways directions.

21. The device of any one of the preceding claims, further comprising an activation structure configured for activating movement of the pusher member for applying the pushing force to the first end of the ventilation tube.

22. The device of claim 20, wherein the activation structure is further configured for activating movement of the cutter member for making the incision

23. The device of claim 22, wherein the activation structure is configured as an automatic operation structure, semi-automatic operation structure, or manual operation structure.

24. The device of claims 21 or 22, wherein the activation structure is configured as a re-usable part of the device configured to cooperate with a disposable part of the device, the

disposable part comprising at least the cutter member, the holder member and the pusher member.