

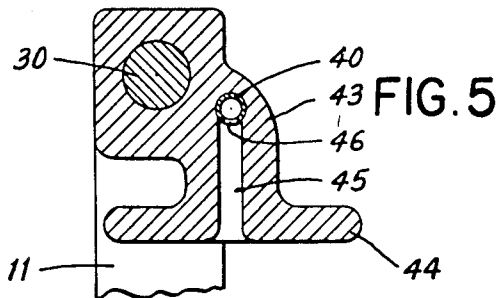
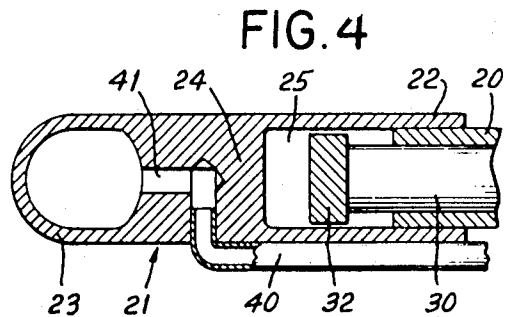
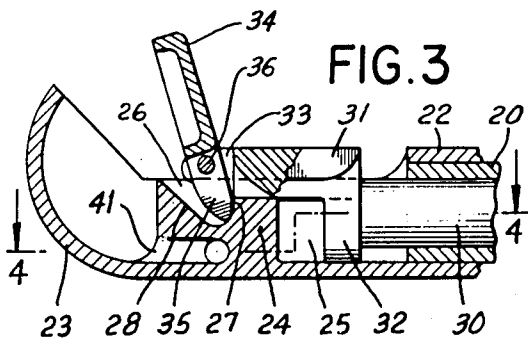
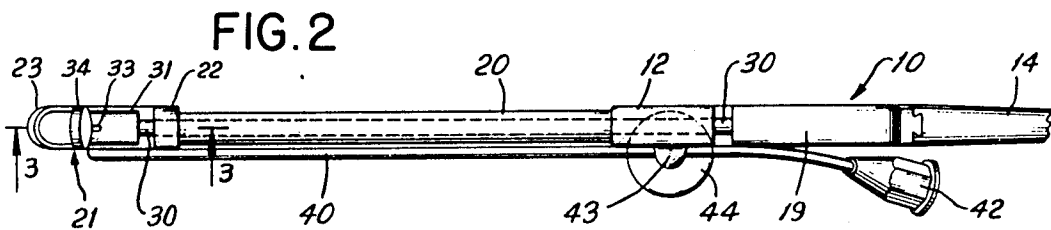
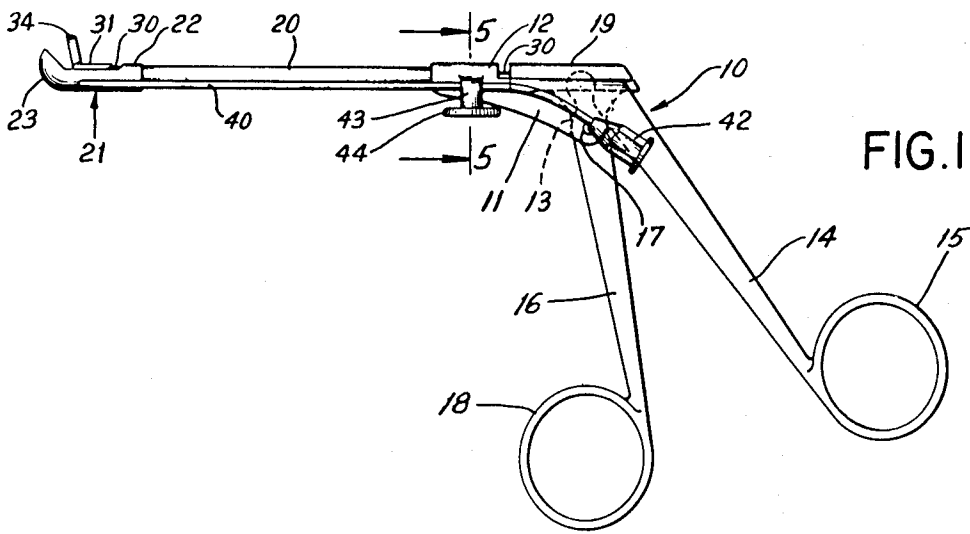
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2,751,908

SURGICAL INSTRUMENT

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2,751,908

**SURGICAL INSTRUMENT**

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**8 Claims. (Cl. 128—321)**

This invention relates to surgical instruments, and more particularly to such instruments that are in the category of surgical forceps. The invention, in one of its more specific aspects, pertains to a forceps type of surgical instrument having improved features of construction, whereby to facilitate reception and retention of a mass of body tissue between the jaws thereof, prior to severance.

Instruments constructed in accordance with this invention are adapted to readily remove masses of body tissue, such as polyps from various body passages including the larynx and nasal cavities. Heretofore, it has frequently been difficult to remove polyps that are joined to walls of such passages by relatively thin membranes, for the reason that, due to the slipperiness of polyps, they cannot be readily grasped and severed with conventional instruments. This difficulty is obviated by the use of my instrument, as will be evident from the detailed description that follows.

The primary object of this invention is to provide an improved surgical instrument for readily removing a mass of tissue from a body passage.

The invention has for another object the provision of a surgical forceps having incorporated therein improved features of construction, whereby a polyp or the like, that is located in a body passage, such as a nasal cavity, may be readily received and retained between the jaws of the forceps, and then severed and removed from the passage.

A further object of the invention is to provide a surgical instrument of the character indicated, that is simple in construction and operation, reasonable in cost, readily sterilized, and capable of performing its intended functions in a satisfactory manner.

To the end that the foregoing objects may be attained, a surgical instrument constructed in accordance with this invention preferably comprises a support, a forceps control unit carried by the support, and a tubular member secured to and extending forwardly of the support. A device is affixed to and projects beyond the distal end of the tubular member. This device includes a hollow first jaw that is open at one end and a body disposed intermediate the jaw and the tubular member. The member is provided with a recess. A rod is positioned in and reciprocable with respect to the tubular member in response to actuation of the control unit. A second jaw is pivotally connected to the distal end of the rod through the intermediary of a block and a pivot pin. The second jaw has an arm that registers with the recess in the body. The parts are so constructed and arranged that the second jaw is moved into and out of engagement with the open end of the first jaw in response to reciprocation of the rod.

The instrument is provided with suction means for drawing at least a portion of a polyp into the first jaw when the jaws are open, and effect retention of the polyp therein until the jaws are closed. This means includes a conduit carried by the support and communicating at one end with the interior of the first jaw. The conduit

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is adapted to be connected at its other end to a vacuum-producing device. A passage in the support establishes communication between the interior of the conduit and the atmosphere. This passage is adapted to be closed off by a finger of the user, in practice.

The enumerated objects, as well as other objects, and the advantages obtainable by the practice of this invention will be readily apparent to persons skilled in the art upon reference to the following detailed description taken in conjunction with the annexed drawing, which respectively describe and illustrate a preferred embodiment of the invention.

In the drawing:

Fig. 1 is a view in side elevation of a surgical instrument constructed in accordance with this invention;

Fig. 2 is a top plan view in enlargement of the instrument shown in Fig. 1, parts being omitted;

Fig. 3 is a view in enlargement taken along line 3—3 of Fig. 2;

Fig. 4 is a view taken along staggered line 4—4 of Fig. 3; and

Fig. 5 is a view in enlargement taken along line 5—5 of Fig. 1.

Referring now to the drawing wherein like reference numerals denote corresponding parts throughout the several views, and more particularly to Fig. 1, I have illustrated therein a combined support and forceps control unit, generally indicated by numeral 10, and including a support 11 having a tubular forward portion 12 and slotted, as indicated at 13. The unit is provided with a first handle 14 having a thumb receiving loop 15 and a second handle 16 that is pivoted to the body by a screw 17 and has a finger receiving loop 18. The upper end of handle 16 is positioned in slot 13 and is coupled to a slide block 19 that is reciprocable with respect to support 11.

A tubular member 20 is secured to support portion 12 and projects forwardly therefrom. Attached to the distal end of tubular member 20 is a unitary hollow device 21, best shown in Fig. 3, and consisting of a tubular element 22, a cup-shaped member or stationary jaw 23, and a block 24 that is disposed between tubular element 22 and jaw 23 and is spaced from the tubular element, as indicated at 25. Block 24 is formed with a recess 26 that is defined in part by merging surfaces 27 and 28.

A rod 30 extends through tubular member 20 and is connected at its proximal end to slide block 19. A generally L-shaped slide block 31 is secured to the distal end of the rod. This block includes a portion 32 that is disposed in space 25 of device 21. Block 31 has a bifurcated forward end portion 33. A second cup-shaped member or movable jaw 34 has an arm 35 that is pivotally connected to bifurcated block portion 33 by a pin 36. Arm 35 registers with recess 26.

Jaw 34 may be moved into or out of engagement with the open end of jaw 23 by imparting reciprocation to rod 30 through the medium of forceps control devices. Jaw 34 is shown in partially open position with respect to jaw 23 in the drawing. The user may actuate jaw 34 into closed position with respect to jaw 23 by imparting counterclockwise movement to handle 16 about pivot screw 17, thereby moving block 19, rod 30 and block 31 toward the left, as viewed in Fig. 1, whereby jaw 34 is also moved toward the left and pivoted in a counterclockwise direction about pin 36.

The instrument is provided with a suction means, which will next be described, for drawing a polyp into jaw 23 when the jaws are in the relative position shown in the drawing. This means includes a conduit 40 secured at one end to device 21 and communicating with the interior of jaw 23 by way of a passage 41 in body 24. The other end of the conduit is equipped with a tubular fitting

42 that is adapted to be connected to a vacuum-producing device (not shown). An extension 43 integral with support portion 12 terminates in a flange or finger rest 44. Extension 43 has a passage 45, open at one end to the atmosphere and communicating at its other end with the interior of conduit 40 by way of a port 46 in the conduit. Extension 43 may be considered as constituting a conduit communicating with conduit 40.

For the purpose of outlining the operation of the illustrated instrument, it is assumed that the parts are in the relative position shown in Figs. 1 to 3 and that fitting 42 is connected to a suitable vacuum-producing device. It is also assumed that the instrument is to be used to remove a polyp from a nasal cavity. The doctor using the instrument inserts the distal end thereof into the cavity and advances the instrument until the opening between the jaws is brought near the polyp. He then places a finger against finger rest 44, thereby closing the outer end of passage 45, creating a partial vacuum in jaw 23. This draws the polyp into jaw 23, whereupon the doctor operates the forceps control unit to bring jaw 34 into engagement with the outer end of jaw 23 thereby severing the polyp from the wall of the nasal passage. The doctor may then remove his finger from finger rest 44 and withdraw the instrument with the contained polyp from the nasal passage.

From the foregoing, it is believed that the construction, operation, and advantages of my present invention will be readily comprehended by persons skilled in the art. It is to be clearly understood, however, that various changes in the apparatus set forth above may be made without departing from the scope of the invention, it being intended that all matter contained in the description or shown in the drawing shall be interpreted as illustrative only and not in a limiting sense.

I claim:

1. In a surgical instrument of the character described, a tubular member, a device secured to and projecting beyond the distal end of the tubular member, said device including a hollow first jaw that is open at one end and a body intermediate the jaw and the tubular member, said body having a recess formed therein, a rod reciprocable in the tubular member, a second jaw, and an arm secured to the second jaw and the distal end of the rod, said arm including a free end that registers with the recess, said second jaw being movable into and out of engagement with the open end of the first jaw in response to reciprocatory movement of the rod with respect to the tubular member.

2. A surgical instrument in accordance with claim 1 including means pivotally connecting the rod to the arm at a point intermediate the second jaw and the free end of the arm.

3. In a surgical instrument of the character described, a tubular member, a device secured to and projecting beyond the distal end of the tubular member, said device including a hollow first jaw that is open at one end and a body intermediate the jaw and the tubular member, said body having a recess formed therein, a rod reciprocable in the tubular member, a second jaw including an arm that registers with the recess and that is pivotally con-

nected to the distal end of the rod, said second jaw being movable into and out of engagement with the open end of the first jaw in response to reciprocatory movement of the rod with respect to the tubular member, a conduit connected to the tubular member and communicating with the interior of the first jaw and adapted to be connected to a vacuum-producing device, and a second conduit communicating with the first conduit and the atmosphere.

4. In a surgical instrument of the character described, a tubular member, a device secured to and projecting beyond the distal end of the tubular member, said device including a hollow first jaw that is open at one end and a body intermediate the jaw and the tubular member, said body having a recess formed therein, a rod reciprocable in the tubular member, a block secured to the distal end of the rod and reciprocable therewith, and a second jaw pivotally connected to the block and including an arm that registers with the recess, said second jaw being movable into and out of engagement with the open end of the first jaw in response to reciprocatory movement of the rod with respect to the tubular member.

5. In a surgical instrument of the character described, a support, a tubular member secured to and extending forwardly of the support, a device secured to and projecting beyond the distal end of the tubular member, said device including a hollow first jaw that is open at one end and a body intermediate the jaw and the tubular member, said body having a recess formed therein, a rod reciprocable in the tubular member, a block secured to the distal end of the rod and reciprocable therewith, a second jaw pivotally connected to the block and engageable with the open end of the first jaw, said second jaw including an arm that registers with the recess, and means carried by the support for imparting reciprocation to the rod and the block, whereby to move the second jaw into and out of engagement with the open end of the first jaw.

6. A surgical instrument in accordance with claim 5, wherein the body is spaced from the distal end of the tubular member, and at least a portion of the block is disposed in the space between the body and the tubular member.

7. A surgical instrument in accordance with claim 5 including a conduit connected to the support and communicating with the interior of the first jaw, said conduit being adapted to be connected to a vacuum-producing device, and a second conduit establishing communication between the first conduit and the atmosphere.

8. A surgical instrument in accordance with claim 5 including a conduit connected to the support and communicating with the interior of the first jaw, said conduit being adapted to be connected to a vacuum-producing device, said support having a passage formed therein establishing communication between the first conduit and the atmosphere.

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