

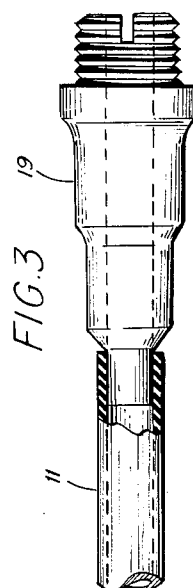
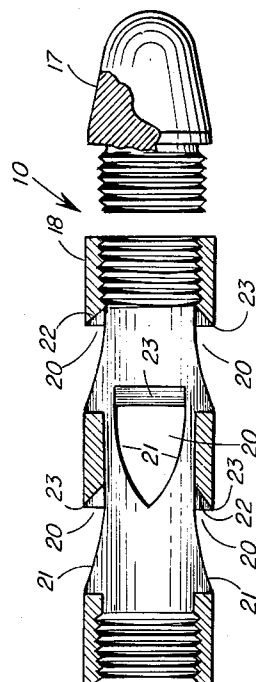
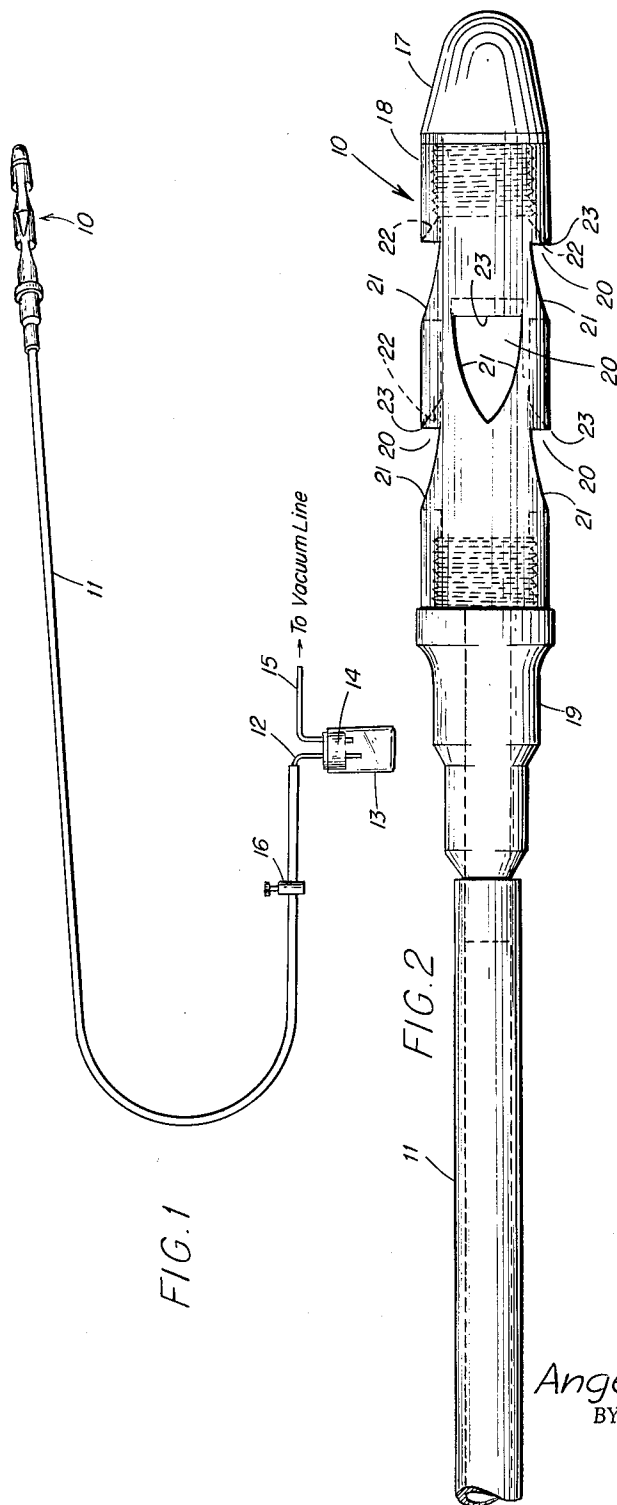
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A. RODRIGUEZ-OLLEROS

3,230,949

GASTROESOPHAGEAL CATHETER

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INVENTOR.

Angel Rodriguez-Ollerros

BY his attorneys

Harrison and Harrison.

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GASTROESOPHAGEAL CATHETER

Angel Rodriguez-Ollerios, San Juan, Puerto Rico, assignor
to Puerto Rico Cancer League Hospital

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1 Claim. (Cl. 128—2)

This invention relates to a surgical instrument, in particular to an apparatus for obtaining samples of tissue from the digestive tract, and specifically to a gastroesophageal catheter.

In the diagnosis and treatment of diseases of the digestive tract it is often desirable to obtain samples of tissue from various places along the tract and instruments are available for this purpose. Such instruments, however, are bulky and inconvenient to use. In some cases the devices have to be removed from the tract after each sample is taken, i.e. samples cannot be taken at different positions with a single insertion.

The present invention remedies these defects, providing a simple, compact and inexpensive device which can be used to obtain as many samples as desired with a single insertion. The invention comprises, in one aspect, a gastroesophageal catheter comprising a flexible tube and a head attached to one end of the tube, said head comprising a plurality of cutting apertures communicating with the interior of said tube.

In another aspect the invention comprises an apparatus for removing samples of tissue from the digestive tract comprising an extended flexible tube, a head attached to one end of said tube and comprising a plurality of cutting apertures communicating with the interior of said tube and means for applying suction to the other end of the tube.

In still another aspect the invention comprises a method for removing tissue from the digestive tract which comprises inserting a tube having a hollow perforated cutting head in the tract, applying suction to the tube to collapse that section of the tract surrounding the cutting head, moving the cutting head to slice small pieces of tissue from the tract, and removing said pieces by suction.

The invention will be further described with reference to the accompanying drawing in which

FIG. 1 is a view in elevation of an apparatus according to the invention.

FIG. 2 is a detailed view in elevation of the cutting head of a catheter according to the invention.

FIG. 3 is a view in vertical section of the cutting head of FIG. 2.

Referring first to FIG. 1, a complete apparatus according to the invention comprises a cutting head 10 to one end of which is attached an extended flexible tube 11, which is made from some physiologically inert material, e.g. polyethylene. The other end of the tube 11 is connected to a bent tube 12 which enters a vial or flask 13 through a double hole stopper 14. A second bent tube 15 connects the flask 13 to a vacuum line (not shown). A valve device 16, which may be a single screw clamp or something more elaborate, is placed on the tube 11 upstream of the flask 13.

Details of construction of the cutting head 10 are shown in more detail in FIGS. 2 and 3. Referring to those figures, the head comprises a smooth blunt tip 17 which is threaded into a cylindrical body 18. The body 18 may in turn be threaded onto a nipple 19 which is inserted into the flexible tube 11. In accordance with the invention the body 18, which is of course hollow, is provided with a plurality of cutting apertures 20. The number and shape of these apertures is subject to variation.

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However, preferably they are more or less triangular or conical in outline and may be likened to notches made as if by two converging cuts in the wall of the body 18. As shown in the drawing, the length of the apertures (in a direction parallel to the axis of the cylindrical body 18) is relatively great compared to their width. Thus the wall 21 of each aperture on the side toward the tube 11, is sloped or beveled gently whereas the wall 22 on the side of the aperture toward tip 17 is cut quite sharply. Moreover, the outer edge 23 of the wall 22 overhangs the aperture 20. This edge 23 is finely ground to provide good cutting capability. Thus when the head is moved to the left (in FIGS. 2 and 3) the edges 23 will slice, pare or scrape strips of material from an object held against the head.

The device is used by introducing the head 10 into the esophagus to the distance desired. The valve 16 is then opened applying suction through tube 11, head 10 and apertures 20 to collapse the adjacent sections of the esophagus against the head. The tube is then lifted or pulled out a few centimeters with a brisk movement. This causes the cutting edges 23 to slice small pieces of tissue from the adjoining walls held against the head by suction. The cut tissue is immediately sucked into the head through the apertures and thence up tube 11 into the flask 13.

In taking samples from the stomach the head may be introduced deep into the antrum. Again suction can be applied, collapsing adjacent walls and the head moved up briskly about 10 cm. The procedure may be repeated say three times, moving the patient each time.

The quantity of material obtained in the manner just described is sufficient for cytological study and paraffin block study, e.g. biopsy. It can also be used for gastritis diagnosis.

It will be obvious that where it is desirable to keep samples obtained from different positions separate from one another this can be done by simply changing the flask 13. It is not necessary to remove the entire apparatus from the patient.

The dimensions of the device may be varied, of course. However, conveniently the body 18 is a 1/4" O.D. stainless steel tube 1 1/4" long. The apertures are 1/4" long (parallel to the axis of the body 18) and 1/4" wide (measured along the edge 23).

What is claimed is:

A gastroesophageal catheter comprising a flexible tube, suction means connected to one end of said tube, and a hollow cutting head attached to the other end of said tube, said cutting head comprising a substantially cylindrical casing having a wall, and a plurality of cutting apertures in said wall, each of said apertures being conical in outline with the base of the cone lying on a circumference of the casing, the side of each aperture forming the base of the cone being undercut to form a cutting edge on the outer surface of the casing and the other sides of the apertures being bevelled to form a sloping surface facing outwardly of the casing.

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RICHARD A. GAUDET, *Primary Examiner.*

JORDAN FRANKLIN, *Examiner.*