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SURGICAL SCOPE WITH SUCTION ATTACHMENT
FOR IMMOBILIZING ADJACENT TISSUE
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2,704,541

Fig. 1.

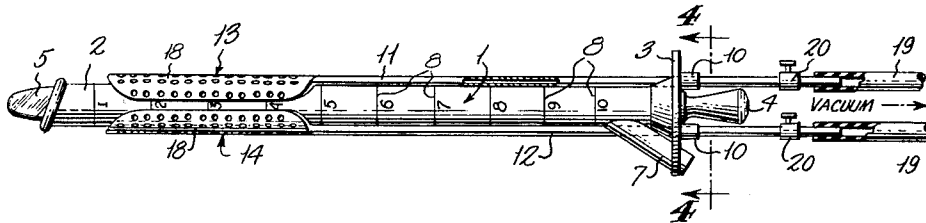


Fig. 2.

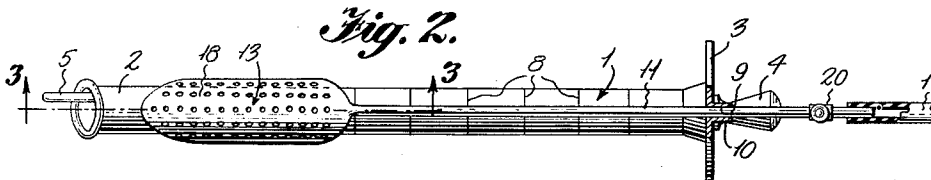


Fig. 3.

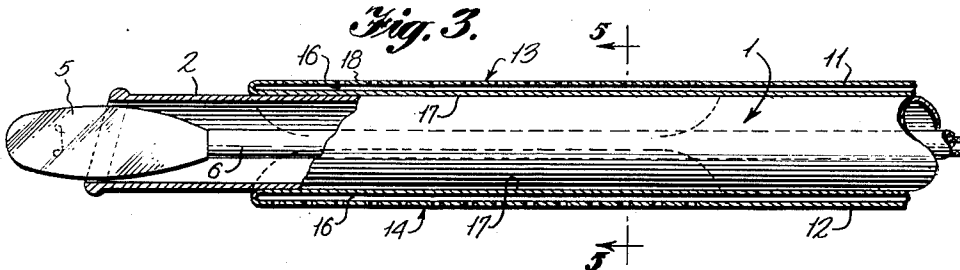


Fig. 4.

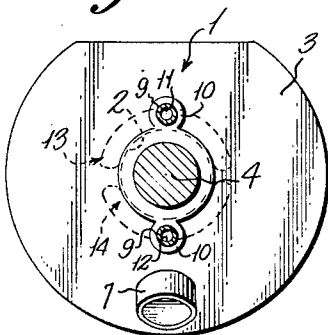
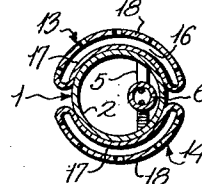


Fig. 5.



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SURGICAL SCOPE WITH SUCTION ATTACHMENT FOR IMMOBILIZING ADJACENT TISSUE

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6 Claims. (Cl. 128—4)

This invention relates to surgical scopes for the visual examination of tubular tracts such as the colon or uterus, and since the instrument employed for purpose of illustration in the following specification is a proctoscope, the invention will be described in relation to such use.

Although the proctoscope is generally scaled so that the extent of its insertion can be accurately controlled, it is difficult to position its inner end at a particular predetermined point in the lumen of the bowel, for the latter is extremely mobile so that it moves with the scope as the latter is advanced or retracted due to the frictional adherence of the lining of the bowel to the outer surface of the scope.

The general object of the present invention is to provide a scope having means associated therewith independently slidable with respect thereto, capable of affixing itself to the lining of the bowel, and having a portion extending to a point outside of the body adapting it to be held when thus affixed so as to immobilize the area of the bowel to which it is attached while the scope is independently moved to the desired position.

Another object of the invention is the provision of a scope as described, in which the affixing means is a perforated plate or plurality of such plates adapted to be connected to a source of vacuum and which fastens itself to the bowel wall by suction.

Other objects of the invention will appear as the following description of a practical embodiment thereof proceeds.

In the drawing which accompanies and forms a part of the following specification, and throughout the figures of which the same reference characters have been employed to denote identical parts:

Figure 1 is a plan view of a proctoscope equipped with the bowel immobilizing instrumentality;

Figure 2 is a side elevation;

Figure 3 is a view in section through the vacuum plates, showing a portion of the proctoscope partly in section and partly in plan taken along the line 3—3 of Figure 2;

Figure 4 is a cross-section taken along the line 4—4 of Figure 1;

Figure 5 is a cross-section taken along the line 5—5 of Figure 3.

At this point it may be stated that the invention does not concern itself with the structure of the scope per se, excepting such part or parts thereof as afford a means for establishing unitary relationship between the scope and the bowel immobilizing instrumentality, since there are many different scopes to which the immobilizing feature may be applied.

Referring now in detail to the several figures, the numeral 1 represents the proctoscope which is of a conventional type, being a viewing tube 2, having a base plate 3 secured perpendicularly thereto at its outer end, and provided with a handle 4 extending from the outer side of the base plate. The tip end of the scope is open, and there is a lamp 5 adjacent the tip end and a tube 6 extending through the viewing tube containing the wires to the lamp, and in the form shown the viewing tube has an inclined branch 7 into which the light beam is deflected by suitable means such as a prism, not shown. The proctoscope has a scale of inches 8, by means of which the extent of insertion of the instrument may be determined and indicated.

The base plate 3 is provided at diametrically opposite points with guide bores 9 axially parallel to the scope, and preferably extending through bosses 10 formed on the

outer side of the base plate. A pair of rigid tubular rods 11 and 12 extend through the base plate, slidably guided in the bores 9. The latter are as nearly as possible tangent to the outside circumference of the viewing tube, so that the rods 10 and 11 lie close to the viewing tube.

Suction plates 13 and 14 are secured to the outer ends of the rods 11 and 12, said plates being transversely curved so as to embrace the viewing tube, and being preferably of such thickness as normally to extend radially no further than the outer sides of the tubular rods 11 and 12. Said rods have a sufficiently free fit within the guide bores 9 to permit the suction plates to spread, upon occasion, to allow the passage between them of the rounded lip at the inner end of the proctoscope. Normally the constriction pressure of the bowel lining against the plates keeps them lightly pressed against the viewing tube.

The plates 13 and 14 are chambered as indicated at 16, the chambers communicating with the bores of the tubular rods. The walls 17 of the plates which lie adjacent the viewing tube are imperforate, while the opposite walls 18 are formed with a pattern of perforations communicating with the chambers 16. The outer end portions of the rods are connected by flexible tubes 19 to a source of vacuum, said portions having cutoff valves 20 by means of which the vacuum to each plate may be independently controlled.

The proctoscope equipped with the bowel immobilizing attachment may be operated in several ways. For example, the suction plates may be inserted in the anus and pushed in with the vacuum cut off until they reach the zone just beyond which the examination is to be made. Vacuum is then applied and the plates affix themselves to the bowel lining through suction. The rods are then held to immobilize the bowel in this zone while the proctoscope is pushed in until its tip projects into the lumen of the bowel ahead of the plates.

The particular object in having a pair of independently slidable plates is to provide two separate areas of attachment to the bowel lining. This permits the instrument to be operated in the following manner. The plates are advanced alternately within the bowel, the vacuum being applied to the one in advance and cut off from the one behind while the scope is being correspondingly advanced. Thus the entire length of the bowel traversed by the plates and scope is progressively immobilized so that none of the tissue is drawn forward with the scope and plates. The same technique may be employed in making the examination in reverse, that is, while the scope is being withdrawn.

While I have in the above description disclosed a practical embodiment of the invention, it will be understood by those skilled in the art that the specific details of construction and arrangement of parts are by way of example and not to be construed as necessarily limiting the breadth of the invention.

What I claim is:

1. Surgical scope for use in a tubular body tract comprising a viewing tube, a base plate fixed thereto at a point remote from the inner end thereof, and means for immobilizing an area of the lining of said tubular tract comprising a suction device including a tubular stem slidable through a bore in said base plate, having a chambered suction plate at its inner end with the chamber of said plate in communication with said stem, said suction plate having perforations through the wall of said chamber remote from the axis of said viewing tube, the outer end of said stem being adapted for connection to a source of vacuum.

2. Surgical scope for use in a tubular body tract comprising a viewing tube, a transverse base plate fixed thereto at a point remote from the inner end thereof, and means for immobilizing an area of the lining of said tubular tract comprising a suction device including a tubular stem slidable through a bore in said base plate having a chambered suction plate at its inner end with the chamber of said plate in communication with said stem, said suction plate having perforations through the wall of said chamber remote from said viewing tube, said plate being concavo-convex in transverse cross-section with its concave side in embracing relation to said viewing tube, the outer end portion of said stem being adapted for connection to a

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source of vacuum and being provided with a cutoff valve.

3. Surgical scope for use in a tubular body tract comprising a viewing tube and suction means carried thereby for immobilizing a selected area of the lining of said tubular tract, said suction means comprising a chambered perforated plate arcuately embracing said viewing tube and slidable thereupon, and means for connecting said plate to a source of vacuum.

4. Surgical scope for use in a tubular body tract comprising a viewing tube, a transverse base plate fixed thereto at a point remote from the inner end thereof, means for immobilizing the lining of said tract comprising a pair of suction devices, the members of said pair each including a tubular stem having a chambered suction plate at its inner end with the chamber of said plate in communication with said stem, said stems being independently slidable through bores in said transverse plate located at opposite sides of said viewing tube, the outer portions of said stems being adapted for connection to a source of vacuum and independently valve controlled, said suction plates being concavo-convex in transverse cross-section with their concave sides in embracing relation to said tube, the convex sides of said suction plates having perforations communicating with the chambers of said plates.

5. In a surgical scope of the general type having a cylindrical viewing tube with a handle at its outer end and a transverse plate between said viewing tube and handle limiting the extent of insertion of said viewing tube, an attachment for said scope comprising a tubular rectilinear stem having a chambered suction plate at one end the chamber of which communicates with said stem the latter being adapted to be connected to a source of

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vacuum at its other end, said suction plate being concavo-convex in transverse cross-section and having perforations in its convex side communicating with said chamber, said attachment being slidably insertable through a bore in said transverse plate with the suction plate on the same side of said transverse plate as said viewing tube, and with the concave side of said suction plate positioned to embrace said viewing tube.

6. In a surgical scope of the general type having a cylindrical viewing tube with a handle at its outer end and a transverse plate between said viewing tube and handle limiting the extent of insertion of said viewing tube, an attachment for said scope comprising a pair of cooperating suction devices, each including a tubular rectangular stem having a chambered suction plate at one end the chamber of which communicates with said stem, the latter being adapted to be connected to a source of vacuum at its other end, said plate being concavo-convex in transverse cross-section and having perforations in its convex side communicating with said chamber, the stems of said suction devices being slidably insertable through bores in said transverse plate located at opposite sides of the axis of said viewing tube, with said suction plates on the same side of said transverse plate as said viewing tube and with the concave sides of said plates positioned to embrace said viewing tube.

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