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ORIFICAL INSTRUMENT CONSTRUCTION

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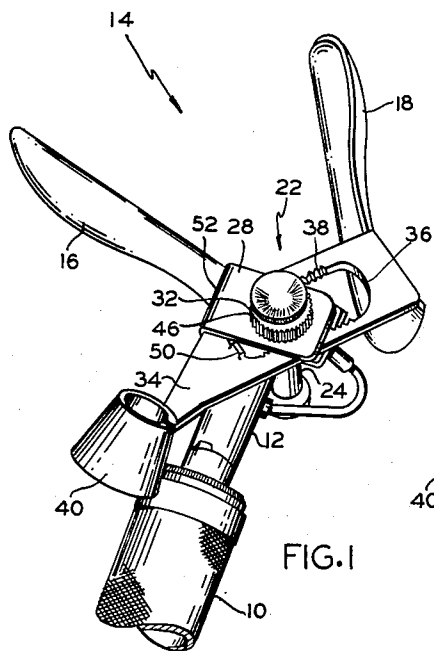


FIG. 1

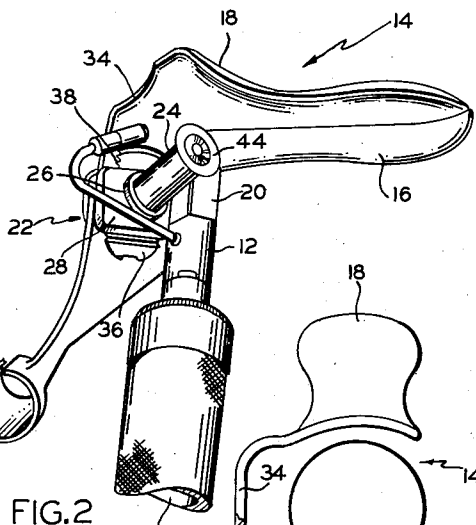


FIG. 2

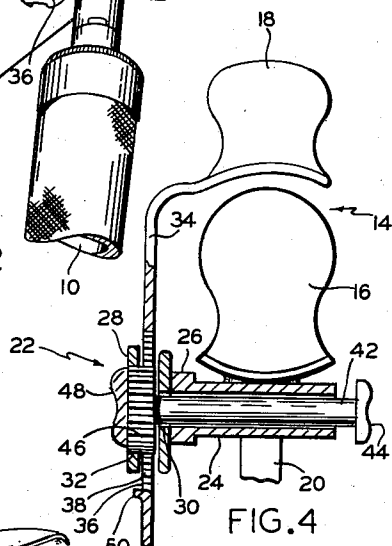


FIG. 4

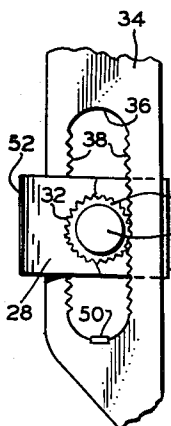


FIG. 6

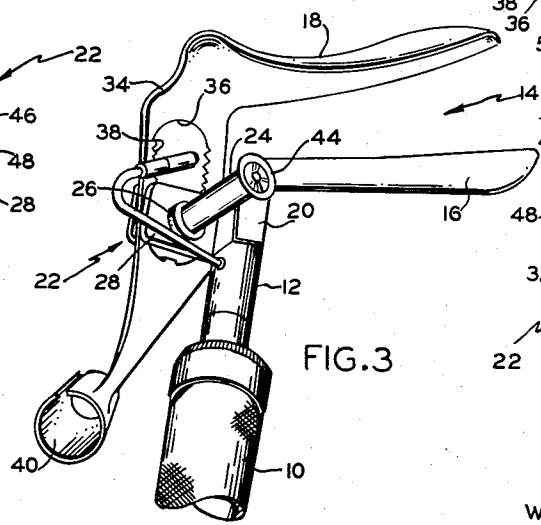


FIG. 3

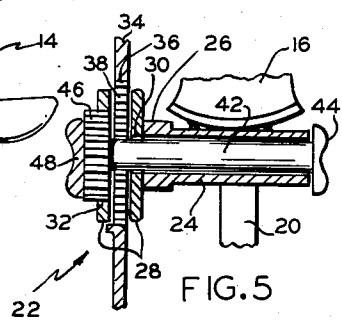


FIG. 5

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ORIFICIAL INSTRUMENT CONSTRUCTION

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2 Claims. (Cl. 128-3)

This invention relates generally to medical instruments of the class employed for the examination of body cavities, and has particular reference to an improved construction for a vaginal speculum or the like.

In the type of instrument referred to, the speculum is comprised of a pair of cooperable blade members, and the position of one of the blade members is adjustable relative to the other to permit the cavity to be distended for closer examination of same. To this end, means are provided on the instrument for varying both the spacing and angular relation of the two blades, and for maintaining them in the desired adjusted position.

While instruments capable of this kind of compound adjustment have long been in use, all of the prior constructions have separate controls for effecting the adjustments, i.e., one mechanism for controlling the spacing of the blades and another mechanism for controlling the angular relation thereof. As a result, a considerable amount of manipulation is required by the physician to effect the desired adjustment and both hands are needed for the process which makes the instruments awkward and inconvenient to use.

With these and other considerations in view, therefore, it is the primary object of the present invention to provide a greatly improved diagnostic instrument of the character described wherein both the lateral spacing and angular relation of the speculum blades can be adjusted by means of a single mechanism so that substantially one handed operation of the instrument is permitted.

Another important object of the invention is to provide a diagnostic instrument of the character described wherein a simple manual manipulation of the adjustment mechanism is operable to effect the compound blade adjustment desired.

A further important object of the invention is to provide a diagnostic instrument of the character described wherein once the desired blade adjustment has been obtained, it can be maintained by means of a novel locking arrangement.

A still further important object of the invention is to provide a diagnostic instrument of the character described which is relatively simple in construction and yet is strong and durable.

Other objects and advantages of the invention will become apparent from the following detailed description thereof read in conjunction with the accompanying drawings which illustrate a representative embodiment of the invention for the purpose of disclosure.

In the drawings:

FIGURE 1 is a perspective view of a vaginal speculum embodying the invention, showing the blade members in one possible operating position;

FIGURE 2 is a perspective view of the instrument taken from the opposite side thereof and showing the blade members in closed position;

FIGURE 3 is a view corresponding to FIGURE 2 wherein the blades have been adjusted to an operating position intermediate the positions shown in FIGURES 1 and 2;

FIGURE 4 is a fragmentary end view, partly in section of the instrument, showing the adjustment controlling mechanism for the blade members in locked position;

FIGURE 5 is a fragmentary view corresponding to

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FIGURE 4 showing the adjustment controlling mechanism in unlocked position; and

FIGURE 6 is a fragmentary side view, partially broken away in the interest of clarity, of the adjustment controlling mechanism for the blade members.

Having reference now to the drawings, wherein like reference numbers designate the same part in each of the views, the instrument is essentially comprised of a conventional battery handle 10, a light carrier 12, and speculum 14. The speculum is formed by a pair of cooperable blade members 16 and 18, the lower blade 16 being fixed and the upper blade 18 being movable relative thereto in a manner to be presently described. The blades are curved in both the longitudinal and transverse directions in the conventional manner for this type of instrument, and the blade edges are rounded so that there will be minimum discomfort to the patient.

The fixed lower blade 16 is rigidly connected at its proximal end to a post 20 which is detachably secured by means of the usual ball detent mechanism to the upper end of the light carrier 12. The upper blade 18 is connected to the lower blade by means of an adjustable connection generally indicated at 22 and, in accordance with the invention, this mechanism permits angular movement of the upper blade as well as vertical or lateral movement for varying the spacing between the blades. In the latter instance, the original disposition of the blades, as viewed in FIGURE 2, can be changed by causing the upper blade to move laterally with respect to the lower blade without disturbing the generally parallel orientation thereof. While the actual movement described occurs through manipulation of the blade 18 as will be hereinafter described, the connecting or control mechanism is operable to permit or prevent the movement.

The mechanism 22 includes a sleeve 24 fixed to the post 20 that supports the lower blade. Sleeve 24 is hollow and includes an enlarged end portion 26 rigidly connected to one side of a substantially U-shaped bracket or clip 28. The bracket is provided with aligned apertures 30 and 32 in the opposed legs thereof, these apertures being of unequal diameter for a reason to be made apparent.

The upper blade member 18 is provided with a depending leg 34, offset from the axis of the blade as is best shown in FIGURE 4. This leg passes with a free sliding fit between the opposed legs of the bracket 28 and is provided with a longitudinally extending slot 36 in the manner shown in FIGURE 6. Opposite sides of the slot 36 are provided with teeth 38 throughout the axial extent thereof. A finger or thumb ring 40 is formed at the lower end of the depending leg 34.

Slidably mounted in the sleeve 24 is an operating element in the form of a shaft or pin 42 having an end push button 44. Secured to the opposite end of the shaft is a pinion 46 having at its outer side a push button 48 similar to the button 44. The outside diameter of the pinion is such that its teeth will mesh with the teeth 38 at the opposite sides of slot 36 in one position of the slidable shaft 42 as is evident from FIGURE 6. The aperture 30 in the bracket 28 is of a diameter to slidably receive the shaft 42, while aperture 32 is of a diameter to receive the pinion 46 and is formed with teeth which mesh with the pinion teeth. The push button 44 is pinned to the end of shaft 42 in the interest of easy assembly of the parts.

In utilizing the instrument described, the shaft 42 is moved to the position shown in FIGURE 5 by pushing inwardly on the button 44 with a finger of the hand holding the battery handle. This moves the pinion 46 outwardly so that it is disposed outside the area defined by the slot 36 whereby engagement of the pinion teeth with the teeth at the opposite sides of the slot is impossible.

The engagement between the pinion teeth and teeth on the bracket aperture 32 makes it necessary to apply a slight pressure to overcome the frictional force tending to maintain the parts in either of the positions shown in FIGURES 4 and 5. With the parts in the position shown in FIGURE 5, the upper blade 18 can be adjusted vertically by manipulating the ring 40 with the thumb or a finger of the hand holding the battery handle, the upper movement of the blade being limited by engagement of the lower end of bracket 28 and a stop 50 at the lower end of the slot 36.

In addition to the movement described, relative angular or pivotal movement can be obtained by pivoting the depending leg 34 relative to the handle by means of the ring 40. Angular movement of the blade 18 relative to blade 16 is limited only by the length of the bracket 28 for it is the back portion 52 of the bracket that engages an edge of the depending leg 34 to limit the pivotal movement thereof as is indicated in FIGURE 1.

Once the desired orientation of the blades has been obtained, the upper blade can be locked in the adjusted position by pushing inwardly on button 48 to return the shaft 42 and pinion 46 to the position shown in FIGURE 4. The shaft and pinion are thus shifted so that the latter moves into the area defined by the slot 36 and its teeth mesh with the teeth 38 at the opposite sides thereof. Since the pinion has sufficient width so that it also remains in engagement with the teeth of aperture 32, this locks the depending leg 34, and thus the upper blade, to the bracket 28 and remainder of the instrument, and the parts will remain locked against further movement until the button 44 is again pushed inwardly to disengage the pinion from the teeth at the sides of the slot as shown in FIGURE 5.

From the foregoing description it will be apparent that the invention provides a relatively simple yet greatly improved adjustment mechanism for an instrument of the character described whereby both lateral spacing and angular adjustment of the speculum blades is controlled by means of a single operating mechanism.

As will be apparent to those familiar with the art, the invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The embodiment disclosed is therefore to be considered in all respects as illustrative rather than restrictive, the scope of the invention being indicated by the appended claims.

What is claimed is:

1. In a diagnostic instrument for the examination of

a body cavity, a speculum comprising a fixed lower blade member and a movable upper blade member, said movable blade member having a depending leg portion, a guide bracket connected to said fixed blade member, said depending leg portion being received in said guide bracket for slidable and pivotal movement relative thereto, one wall of said bracket having a circumferentially toothed aperture therein, a pinion mounted in meshing engagement with said toothed aperture and being laterally slidable relative thereto, and means on said depending leg portion engageable by said pinion in one lateral position thereof to rigidly lock the leg portion and bracket together thereby preventing movement of the leg portion relative to the bracket, said pinion being slidable to another lateral position out of engagement with said leg portion locking means to permit said relative movement.

2. In a diagnostic instrument for the examination of a body cavity, a speculum comprising a fixed lower blade member and a movable upper blade member, said movable blade member including a depending leg portion having a slot formed therein, teeth formed on the opposite longitudinal sides of said slot, a guide bracket connected to said fixed blade member, said depending leg portion being received in said guide bracket for slidable and pivotal movement relative thereto, and slidable means extending through the sides of said bracket and said depending leg portion slot to connect the leg portion and bracket together, one wall of said bracket having a circumferentially toothed aperture therein, said slidable means including a pinion, said pinion being mounted in meshing engagement with said toothed aperture and being laterally slidable relative thereto, said slidable means having a first operating position wherein said pinion is positioned out of engagement with said slot teeth to permit relative slidable and pivotal movement of said depending leg portion and a second operating position wherein said pinion is in engagement with said slot teeth and locks said depending leg portion and bracket together to prevent said relative movement.

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