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F. C. SPENCER
MEDICAL INSTRUMENT
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2,729,210

FIG. 1.

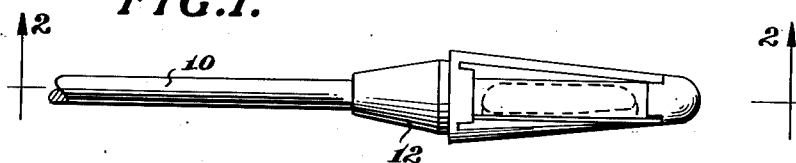


FIG. 2.

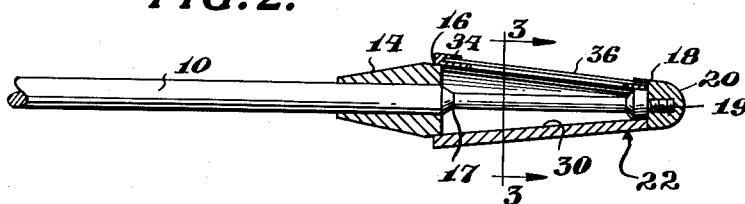


FIG. 3.

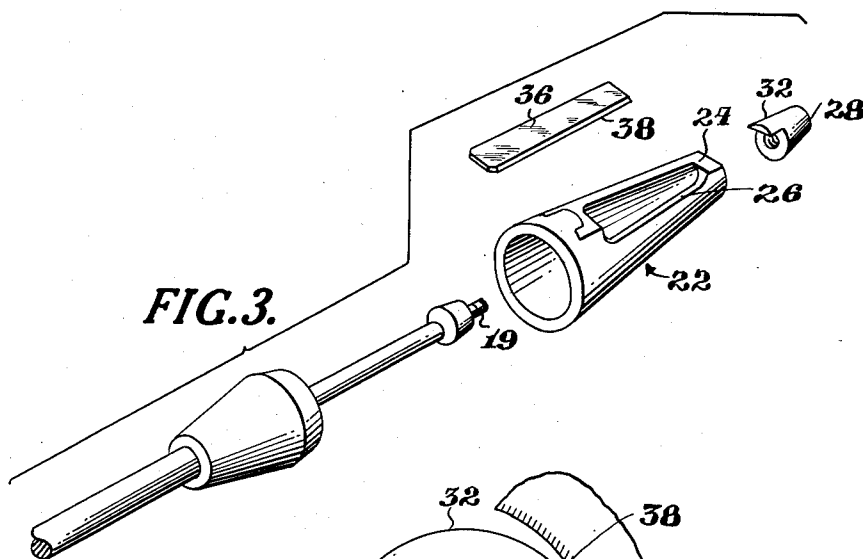
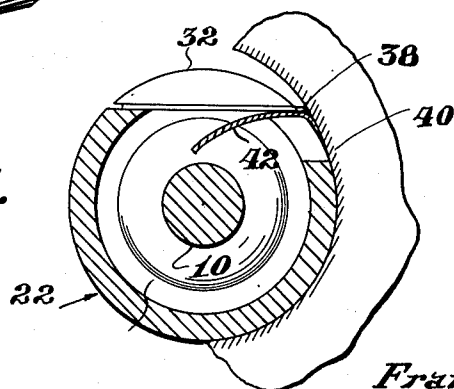


FIG. 4.



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2,729,210

MEDICAL INSTRUMENT

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7 Claims. (Cl. 128—2)

This invention relates to a surgical instrument used for diagnostic purposes. More particularly, this invention relates to a surgical instrument which is adapted to remove circumferential samples of tissue from body cavities, such as the cervix of the uterus.

It is well known to those skilled in the medical arts that cancer of the cervix in its early stages is a purely local disease and, if detected, may be successfully treated without permanently damaging the reproductive system. As it is extremely desirable to detect any malignancy in its early stages, it has become a universally accepted practice to include a cervical scraping in the physical examinations of women of cancer age.

Various instruments for performing the scraping operation have been proposed, but these instruments have had a cutting edge formed integral with the body of the instrument itself, so that any dulling or chipping of the curetting edge renders it useless and requires a replacement of the entire instrument.

It has also been found that an instrument having an integral cutting edge has several other inherent disadvantages, such as its lack of versatility. For example, the instruments presently in use do not allow the technician to selectively determine the amount or thickness of the specimen of the cervical epithelium which is to be removed. It will be readily seen that it is desirable to be able to vary the depth of cut of the scraping instrument so that, upon occasion, the technician may obtain samples of cells which will disclose the location of non-invasive carcinoma which may be present intra-epithelially.

It has also been found that on some occasions it is desirable to vary the relative sharpness of the cutting edge; for example, when the patient is suffering cervicitis or endometritis, the condition and firmness of the tissue are at a variance from the norm, and this will affect the size and characteristics of a specimen procured with a given cutting edge.

It will, therefore, be readily seen that a cervical scraper having a replaceable or interchangeable blade arrangement can replace a plurality of instruments of the conventional design. Thus, such an improvement will not only reduce the cost of providing cervical scraping instruments, but will also serve to reduce the sum total of the number of instruments required by modern medical practice.

It is, therefore, an object of this invention to provide a cervical scraper which is adapted for use in routine vaginal examinations.

It is another object of this invention to provide a cervical scraper which is provided with a replaceable blade.

It is another object of this invention to provide a cervical scraper which is provided with a replaceable blade which may be selectively installed to provide varying depths of cutting or sampling.

It is still another object of this invention to provide a cervical scraper which may be used for obtaining a continuous circumferential epithelial specimen from the cervical canal.

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These and other objects of my invention will be fully understood from the following detailed description of a typical preferred form and application of the invention, throughout which description reference is made to the accompanying drawings in which:

Figure 1 is a plan view of a cervical scraper;

Figure 2 is a section taken along line 2—2 of Figure 1;

Figure 3 is a perspective view of the scraper with the various elements exploded to more clearly illustrate their form and relationship; and

Figure 4 is a section taken along line 3—3 of Figure 2.

Referring to the drawings, and more particularly to Figures 1, 2 and 3, the cervical scraper has a stem 10 which may be of any suitable length and which may be provided with a handle (not shown). The stem carries a collar 12 thereon adjacent one end thereof, which may be either welded, threadably engaged, pinned, or shrink fitted on the stem 10.

The shoulder is shaped to a double frusto-cone with the surface 14, towards the handle, and the surface 16, towards the free end of the stem, sloping inwardly towards the axis of the stem. The end portion of the stem 10, adjacent the collar 12, is reduced in size at 17 and carries a frusto-conical collar 18 fixed thereto. The free end 19 of the stem is threaded to threadably engage a blade clamp 20, as will be discussed hereinafter.

A blade supporting head, generally indicated at 22, comprises an open ended frusto-conical tubular element which has a portion of its longitudinally extending side wall cut away to form a planar surface 24 which is parallel with a locus line of its side wall surface. A further portion of its side wall is cut away, as at 26, to define a longitudinally extending opening into the interior or lumen of the blade supporting head. The reduced portion of the stem 10 is inserted within, and extends through, the lumen of the blade supporting head 22; that is to say, the blade supporting element is disposed circumjacent the stem 10 between the collar 12 and the free end of the stem 19. The inner surface 30 of the major end of the blade supporting head 22 abuts against the tapered surface 16 of the collar 12, and the inner surface of its minor end rests on, and forms a snug fit with, the peripheral surface of the collar 18, which has a taper congruent with the inner surface 30. The blade clamp, as discussed hereinabove, is threadably engaged with the threaded free end 19 of the stem, as shown in Figure 2, and has an exterior surface which is gently rounded to prevent the injury or bruising of delicate organs. Its wall surface is formed to make a flush union with the minor end of the blade supporting head 22. The blade clamp has a shoulder 32 which extends over the planar surface 24 when the blade clamp is drawn tight into an abutting relationship with the minor end of the blade supporting head 22. It should be mentioned here that such a selective tightening of the blade clamp 20 on the threaded end 19 of the stem 10 will cause the major end of the blade support to ride up on surface 16, which has a greater taper than inner surface 30, until it is juxtaposed with a tight forced fit.

As shown in Figures 1, 2 and 3, the planar surface 24, which defines a blade support, extends longitudinally of the surface of the blade supporting head 22. A short lip 34, which is integral with the side wall of the blade supporting element 22, is cantilevered over the end of the planar surface 24 which is nearest the major end of the blade supporting head. The lip has a flat undersurface which is parallel with planar surface 24 and has an upper or exterior surface which conforms to the general configuration of the blade supporting head 22. The undersurface of the lip 34 is spaced from the planar sur-

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face a distance substantially equal to the thickness of a suitable blade 36.

As best shown in Figures 2 and 3, the shoulder clamp 32 has a flat undersurface which is parallel with planar surface 24 and has an upper or exterior surface which conforms to the general configuration of the blade supporting head 22. The undersurface of the shoulder 32 is spaced from the planar surface a distance substantially equal to the thickness of a suitable blade 36.

It will be seen that the shoulder 32 and one end of the planar surface 24, and the lip 34 and the other end of the planar surface 24, define blade receiving grooves to confine and hold the blade 36 which is disposed upon the planar surface 24. As best illustrated in Figures 1 and 4, the blade is selectively located on the planar surface 24 with its cutting edge 38 everted slightly beyond the normal root circles of the frusto-conical blade supporting head 22.

It will be readily seen that the technician may select any of a large number of blades having varying degrees of sharpness and that the blades may be selectively located with the edges projecting from the root circles of the head 22 any desired distance. The technician is thus able to effectively control the depth of cut of the instrument.

In use, the instrument is provided with a suitable blade, installed with the desired "bite" or depth of cut, and is inserted into the cervical canal after the cervix has been exposed by a vaginal speculum. While the instrument is being directed to its operative position, it is so manipulated that the cutting edge 38 of the blade does not contact or damage the walls of the vagina or the entrance of the cervix. This may be done by holding the instrument to one side of the passages and also by rotating the instrument in a counterclockwise direction, as viewed in Figure 4. The blade 36 is formed to present a cutting edge 38 on its underside, so that counterclockwise rotation of the instrument, as viewed in Figure 4, will not cut or damage tissue in contact with the blade.

As shown in Figure 4, as the instrument has a conical surface configuration, which conforms to the general shape of the cervical canal, the instrument will maintain a close contact with the walls 40 thereof. The instrument is then rotated in a clockwise direction, as viewed in Figure 4, so that the cutting edge 38 of the blade 36 will peel off a thin, continuous strip of the epithelium. The specimen strip 42 is directed by the undersurface of the blade 36 into the lumen of the blade supporting head which forms a tissue specimen receiving reservoir. When the instrument has been rotated through an entire revolution, a complete circumferential sample of the wall of the cervical canal will be retained within the tissue specimen reservoir. The instrument may then be withdrawn, while being rotated counterclockwise, as viewed in Figure 4, so that the blade will not cause any damage to the walls of the vagina.

By rotationally orienting the instrument before the cutting operation is begun, it is possible for the technician to determine, upon subsequent examination, the exact area of the cervical canal from which a particular portion of the strip of tissue was removed. This is particularly helpful when malignancy is at an early stage and is localized in one portion of the cervix.

Having described only a typical preferred form and application of my invention, I do not wish to be limited or restricted to specific details herein set forth, but wish to reserve to myself any variations or modifications that may appear to those skilled in the art and falling within the scope of the following claims:

I claim:

1. A curetting instrument for obtaining a continuous circumferential specimen tissue strip from a body cavity

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comprising: a stem; a frusto-conical hollow blade support secured to said stem, a portion of the peripheral wall of said blade support being cut away to define a planar blade supporting surface parallel with a locus line of said frusto-conical blade support, an adjacent portion of the wall being cut away to define a longitudinal opening communicating with the lumen of the blade support; and means to clamp a replaceable longitudinally extending blade on said planar surface.

2. In the structure defined in claim 1, a replaceable blade on said surface with a cutting edge everted from a line defining the loci of the root circles of the blade support.

3. A curetting instrument for obtaining a continuous circumferential specimen tissue strip from a body cavity comprising: a stem; a hollow frusto-conical blade support, a portion of one side of said blade support being formed to define a planar blade supporting surface; a collar on said stem adjacent one end thereof; said blade support being disposed circumjacent said stem between said collar and said end, with the major end of said blade support abutting said collar; a blade clamp fixable on said end of said stem and abutting the minor end of said blade support; a replaceable blade held on said surface by said blade clamp, said blade support being formed with a longitudinal opening defined by said blade and said blade support communicating with the lumen of said blade support to receive strips of tissue gathered by said blade.

4. A curetting instrument for obtaining a continuous circumferential specimen tissue strip from a body cavity comprising: a stem; a frusto-conical hollow head circumjacent one extremity of said stem, a longitudinally extending portion of the periphery of said head being formed to present a planar surface to support a replaceable cutting blade; a longitudinally extending opening in said head to receive a tissue strip cut by the blade; the lumen of said head defining a tissue receiving chamber; a blade clamp fixable on the end of said stem; a shoulder on said blade clamp extending over said planar surface to define a blade retaining slot.

5. A curetting instrument for obtaining a continuous circumferential specimen tissue strip from a body cavity comprising: a stem; a hollow frusto-conical blade support; a collar on said stem adjacent one end thereof; said blade support being disposed circumjacent said stem between said collar and said end, with the major end of said blade support abutting said collar; a blade clamp fixable on said end of said stem and abutting the minor end of said blade support; said blade support being formed with a longitudinal opening communicating with its lumen to receive the strip of tissue.

6. In the structure defined in claim 5: a longitudinally extending portion of the periphery of said blade support being formed to present a planar surface to support a replaceable cutting blade; a shoulder on said blade clamp extending over said planar surface to define a blade retaining slot; a lip cantilevered from said blade support over said planar surface to define a second blade retaining slot.

7. A curetting instrument for obtaining a continuous circumferential specimen tissue strip from a body cavity comprising: a stem; a hollow blade support, circular in cross-section, secured to said stem, a portion of the peripheral wall of said blade support being cut away to define a planar blade supporting surface parallel with a locus line of said blade support, an adjacent portion of the wall being cut away to define a longitudinal opening communicating with the lumen of the blade support; and means to clamp a replaceable longitudinally extending blade on said planar surface.

No references cited.