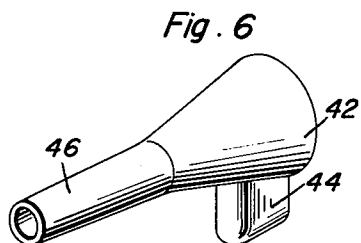
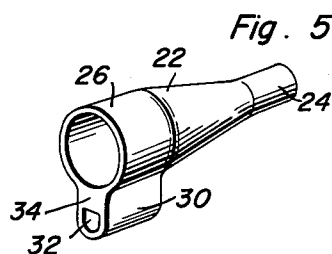
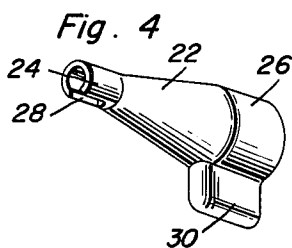
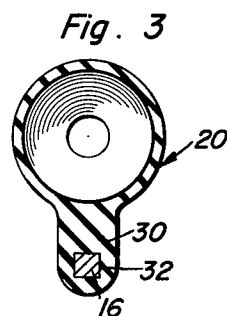
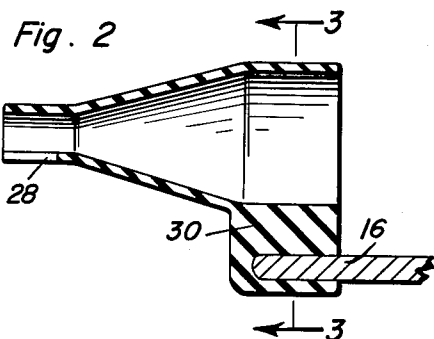
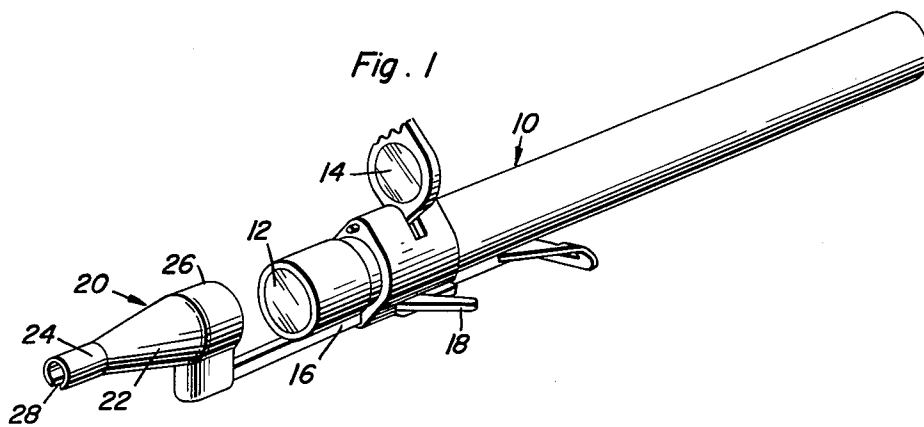


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J. F. HARDGROVE
FLEXIBLE EAR SPECULUM

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James F. Hardgrove
INVENTOR.

BY *Charles A. Peterson*
and *Harvey R. Jacobson*
Attorneys

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3,224,437

FLEXIBLE EAR SPECULUM

James F. Hardgrove, Universal Products Corp.,
Collegeville 2, Pa.

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3 Claims. (Cl. 128-9)

The present invention relates generally to a diagnostic instrument, and more particularly to a flexible ear speculum.

One of the major problems involved in the use of a standard rigid ear speculum is the danger of injury to the patient from sudden unexpected movement of the patient's head while the speculum is inserted within the ear of the patient. This danger is particularly prevalent in dealing with children, or nervous or uncooperative people. Additionally, this fear of sudden movement tends to reduce the efficiency of diagnostic examinations as well as operative procedures generally accompanied by the use of a speculum.

Accordingly, one of the primary purposes of the present invention is the provision of an ear speculum which will enable the proper exploration of a patient's ear without the fear of injury due to sudden or unexpected movements of the head.

Another object of the present invention is the provision of an ear speculum which is capable of flexing with any movement of the patient's head so as to avoid damage of the interior of the ear.

A further object of the present invention is the provision of an ear speculum which will automatically return to its proper shape upon the removal of any external forces which would tend to bend the flexible speculum.

Additionally, an object of the present invention is the provision of an access slot in the forward end of the speculum so as to enable the ready insertion of various operative tools into the ear through the speculum.

Likewise, an object of the present invention is the provision of a near speculum which is easily attached and removed from a standard diagnostic instrument.

Further, an object of the present invention is the provision of an efficient and easy to manufacture speculum, the low cost of which enables it to be discarded after a single use of the speculum.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a perspective view of the speculum of the present invention secured to a standard diagnostic device;

FIGURE 2 is a cross-sectional view of the speculum of the present invention illustrating the manner in which the speculum is secured to a diagnostic instrument;

FIGURE 3 is a cross-sectional view taken substantially on a plane passing along line 3-3 of FIGURE 2;

FIGURE 4 is a front perspective view of the speculum of the present invention;

FIGURE 5 is a rear perspective view of the speculum of the present invention; and

FIGURE 6 is a perspective view of the modification of the speculum of the present invention.

Referring now more particularly to the drawings, the reference numeral 10 generally designates a standard diagnostic instrument, such as shown in Patent No. 1,938,364, having a light directing lens 12, a magnifying lens 14, a tongue bar 16 and a bar lock 18.

The speculum of the present invention is generally

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referred to by reference numeral 20 and consists of a substantially frusto-conical shaped body portion 22, a cylindrical extension 24 extending from the apex end of the body section 22 and a cylindrical portion 26 extending from the base end of the frusto-conical body 22. This speculum 20 is formed of a flexible resilient material such as plastic or rubber, or any other suitable material capable of flexing so as to avoid damage to the interior of a patient's ear. The cylindrical portion 24 is slightly less flexible than the body portion 22 so as to prevent a complete closing of the speculum 20. However, the flexibility of the body portion 22 enables the forward extending section 24 to be pushed to either side or even directly backwards in a manner so as to fold the cylindrical section 24 within the body section 22, thus avoiding any excess or sudden pressure on the interior of the ear.

The cylindrical section 24, formed integral with the body portion 22, is provided with a slot 28 extending through the wall of the section. This slot 28 is highly significant in that it enables the user of the device to readily remove foreign objects from the ear through the speculum, and additionally provides a convenient access means for the introduction of various tools such as ear probes or ear spoons into the interior of the ear for the performance of various operations on the ear.

The cylindrical section 26, formed integrally with the base of the body section 22, includes a downwardly projecting extension 30, also of a flexible nature. The downwardly projecting extension 30 is provided with an aperture or blind bore 32 formed in its rear end 34 so as to frictionally engage the extending end of the tongue bar 16. The aperture 32, before the insertion of the tongue bar 16, has an opening which is of slightly smaller size than the cross-section of the tongue bar 16 so as to require the exertion of a slight force to cause a widening of the aperture 32 during the insertion of the tongue bar 16 thereby insuring a secure fastening of the speculum on the tongue bar 16. This frictional engagement between the speculum 20 and the tongue bar 16 prevents any accidental removal of the speculum 20 during the use thereof inasmuch as a positive pulling force is required to remove the speculum 20.

FIGURE 6 illustrates a modification of the speculum of the present invention comprising a tapered body portion 42 having an aperture containing projection 44 secured thereto at its wider end, and an extended cylindrical portion 46 secured to the apex end of the body portion 42.

As is readily apparent, the ear speculum of the present invention can be made in a variety of sizes for use in an examination of both human ears and various animal ears as would be required by veterinarians.

Further, when entering the ear, the slot in the end permits speculum opening to taper and fold in slightly, thereby adapting to the individual variations in the size of the ear entrance.

As set forth in detail supra, the speculum of the present invention is constructed of a flexible and resilient material thus allowing it to readily flex in a manner so as to avoid damage to a patient's ear during the examination thereof. This will additionally improve the quality of the examination in that the user of the device will no longer be bothered by the fear of inflicting extensive damage on the ear of the patient. Upon the exertion of any unexpected or excessive pressure on the extending end of the speculum, this end will merely flex to one side or fold rearwardly, thus preventing damage to the ear. Immediately upon removal of this force or pressure, the speculum will return to its original shape thus allowing the continuation of the examination. This use of a flexible speculum is invaluable in the examination

of children both because of the difficulty in preventing sudden movements in a child and because of the extreme tenderness of a child's ear. Also, it will be noted that the flexibility of the ear speculum body combined with the end slot permits the operator more freedom of movement, and, the exercise of more leverage and a more extensive range of manual movements is then possible contrary to the situation where the operator's manual movements are limited by circumscribed space limitations of a rigid speculum.

An additional significant feature of the invention involved herein is the provision of an access slot on the narrow end of the speculum so as to facilitate the removal of foreign bodies from the ear and to additionally facilitate introduction of various tools into the interior of the ear through the speculum for performing various operations on the ear. The speculum of the present invention is also particularly adapted to be easily attached to and removed from a diagnostic device, generally containing a light source, in a manner so as to insure a positive connection between the speculum and the diagnostic device during the use of the speculum with the flexibility permitting the use of an inexpensive, common flashlight bulb which does not have the exact light beam focus quality of the expensive, special purpose bulbs, the manipulation of the flexible rubber ear speculum being used to focus and direct the light beam to secure maximum illumination on the precise quadrant or portion of the inner ear desired. Additionally, the easy manner in which the speculum can be removed further facilitates the rapid sterilization of the speculum for further use. However, because of the relatively low cost involved in the manufacture of the present device, the speculum, if so desired, can be thrown away after a single use.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. For use in conjunction with a light containing diagnostic instrument, an ear speculum consisting of a hollow substantially frusto-conical body open at its base and apex ends, said speculum being formed of a flexible resilient material and capable of lateral deflection upon contact with the interior of an ear so as to prevent damage to the ear, said deflection also directing the passage

of a light beam through the body so as to control the illumination of the interior of the ear, an access slot through the body extending inwardly a short distance from the apex end thereof, said slot allowing for a slight inward folding of the apex end upon engagement of the speculum within an ear, and a downwardly extending longitudinally oriented solid projection integral with the base end of the body and similarly formed of flexible resilient material, said projection having a blind bore extending inwardly into the solid projection from the end thereof corresponding to the base end of the body, said bore being of a size so as to frictionally engage a projecting support on a diagnostic instrument in order to mount the speculum thereon.

2. For use in conjunction with a light containing diagnostic instrument, an ear speculum consisting of a hollow substantially frusto-conical body open at its base and apex ends, said speculum being formed of a flexible resilient material and capable of lateral deflection upon contact with the interior of an ear so as to prevent damage to the ear and to also direct the passage of a light beam therethrough, an integral hollow narrow cylindrical extension extending from the apex end, and an access slot through the bottom of the narrow extension extending inwardly from the outer end thereof, the cylindrical wall of the extension being otherwise impermeable, said slot allowing for a slight inward folding of the extension upon engagement of the speculum within an ear.

3. The device of claim 2 including an integral hollow wide cylindrical extension extending from the wide base end, and a downwardly extending projection integral with the wide cylindrical extension, said projection having an aperture formed in the outer end thereof, said aperture being of a size so as to frictionally engage a projecting support on a diagnostic instrument.

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RICHARD A. GAUDET, *Primary Examiner.*

50 RICHARD J. HOFFMAN, *Examiner.*