

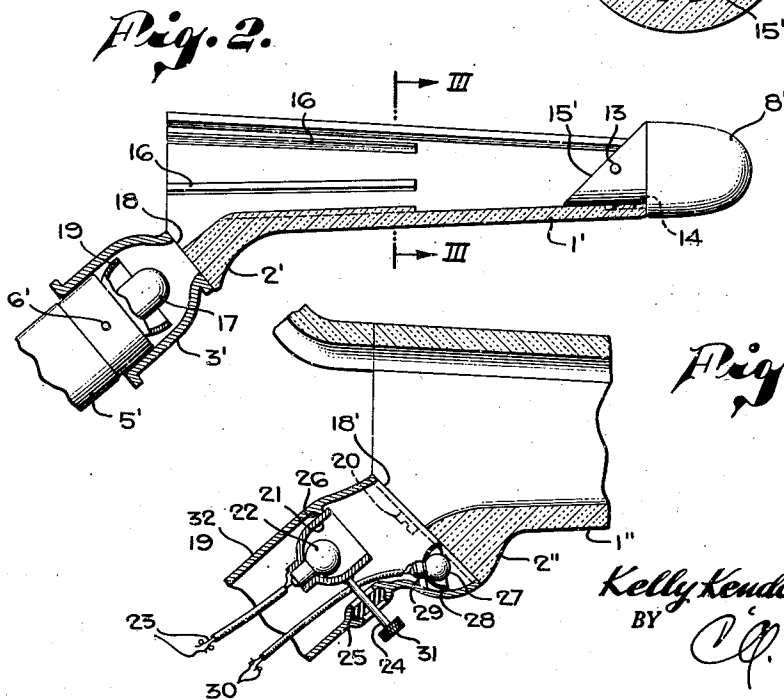
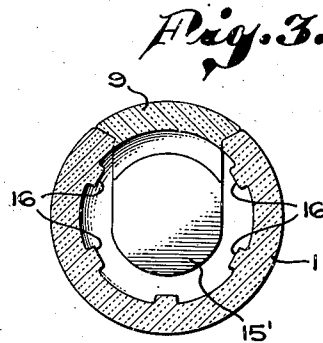
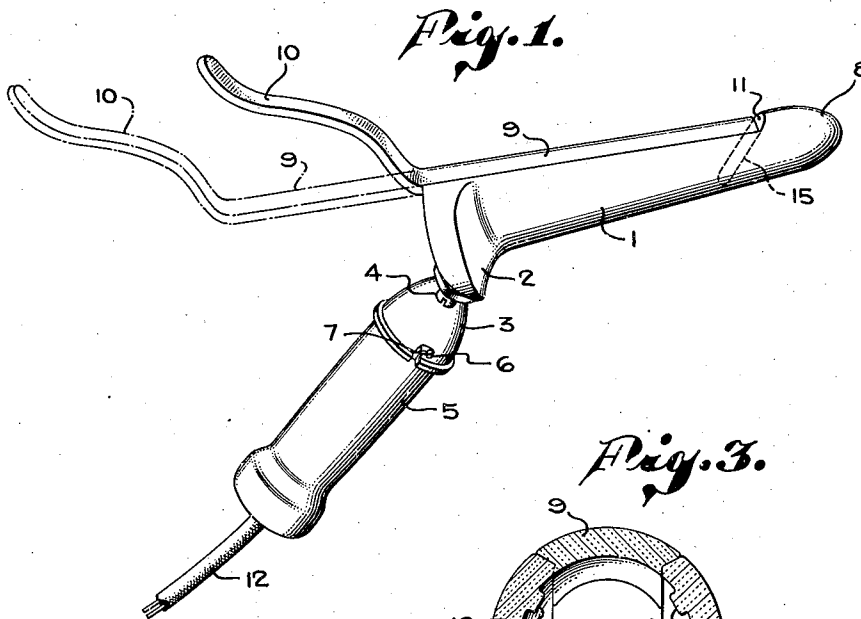
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SELF-ILLUMINATED TRANSPARENT PROCTOSCOPE

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SELF-ILLUMINATED TRANSPARENT
PROCTOSCOPE

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16 Claims. (Cl. 128—6)

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This invention relates generally to an improved body orificoscope adapted for use in visually examining the interior of a body orifice, and more specifically relates to an improved, self-illuminated, transparent proctoscope adapted for use in visually examining and treating rectal abnormalities, such as fissure, fistula, hemorrhoids, etc.

Before enumerating the disadvantages of prior art constructions which my invention avoids, I will briefly describe the general structure of certain prior art proctoscopes. Generally speaking, they have been of metallic, hollow, conical form, having a removable slide in one side thereof, which is adapted to be removed after the proctoscope has been placed in position within the rectum, for permitting examination of that portion of the surrounding rectal wall over the opening created by the removal of said slide. In order to illuminate this limited area, an auxiliary light must be directed from the rear of the proctoscope through the hollow interior and through the opening created by the removal of the slide and onto that portion of the rectal wall exposed. This has numerous disadvantages; for example, before removing the slide, no portion of the rectal wall may be seen, and it may be necessary after removing the slide and examining a limited portion of the rectal wall, to remove, rotate and reinsert the proctoscope in a new angular position about its axis and again remove the slide and examine another sectional area of the rectal wall. It may be necessary to repeat this operation a number of times before the entire area of rectal wall surrounding the proctoscope has been examined for locating a suspected abnormality. Furthermore, the focusing of the auxiliary external light through the interior of the barrel and out through the opening created by the removal of the slide onto the rectal wall, is a time-consuming and complicated operation and exceedingly inconvenient.

Another disadvantage of prior art proctoscopes arises from the fact that they are made of metal of high thermal conductivity, thus causing thermal shock upon insertion. Furthermore, rectal treatment employing an electric needle for electro-extirpation or electro-coagulation is hazardous, since the patient may suffer an electric shock if the needle is allowed to contact the proctoscope.

Generally speaking, the apparatus of the present invention comprises a self-illuminated, transparent proctoscope including a handle, electric lamp means mounted in said handle, and a hollow barrel of transparent, acrylic resin attached to said handle containing said lamp means, whereby

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light from said lamp means will illuminate virtually the entire rectal wall in contact with said hollow barrel. The preferred form of the present invention may also include a removable slide in one side of the hollow barrel.

It will be seen that the present invention avoids all of the hereinabove mentioned disadvantages of the prior art structures, since the lamp means are contained within the handle and no auxiliary outside lamp is necessary. The proctoscope is transparent; therefore, virtually the entire area of the rectal wall in contact therewith may be examined at one time without the necessity of removing the slide at all, and without repeated insertions. Furthermore, since the hollow barrel is of transparent, acrylic resin, the light will be carried or "piped" by the walls of the barrel throughout the entire body of the proctoscope and will thus cause a relatively even illumination of the entire rectal wall in contact therewith. This occurs by reason of the fact that acrylic resin, preferably methyl methacrylate, is utilized in the proctoscope. This type of resin has the peculiar optical property of virtually "piping" light admitted at the end of a rod or tube, therealong and emitting same laterally at points of surface discontinuity, irregularity and non-smoothness. Furthermore, since the barrel is made of a material having a low thermal conductivity, thermal shock is avoided.

With the above points in mind, it is an object of this invention to provide a new and novel, self-illuminated, transparent proctoscope adapted for use in visually examining and treating rectal abnormalities.

In addition electric needle therapy may readily be employed without the danger (hereinbefore mentioned) of electrically shocking the patient.

It is a further object of this invention to provide a new and novel, self-illuminated, transparent proctoscope adapted for use in visually examining the lower rectal region and whereby the entire surrounding rectal wall may be visually examined at one time without the aid of an auxiliary light.

It is a further object of this invention to provide a new and novel, self-illuminated, transparent proctoscope adapted for use in visually examining the lower rectal region and whereby a beam of light may be selectively directed to any desired rectal area for illuminating same for visual examination.

It is a further object of this invention to provide a new and novel, self-illuminated, transparent body orificoscope adapted for use in vis-

ually examining the interior of various body orifices.

Another object of the invention is to provide a self-illuminated, transparent proctoscope having a barrel of transparent, acrylic resin, whereby light may be carried or "piped" within the walls of said barrel for illuminating virtually the entire rectal walls in contact therewith.

Other and allied objects will become apparent to those skilled in the art upon a careful examination and study of the specification, illustrations and appended claims.

To facilitate understanding, reference will be had to the following illustrative drawings, of which:

Fig. 1 is a perspective view of one illustrative embodiment of this invention.

Fig. 2 is a diagrammatic, side, vertical section of a slightly modified form of this invention.

Fig. 3 is a sectional view taken along the plane III-III of Fig. 2.

Fig. 4 is a diagrammatic, illustrative, fragmentary, sectional view of a slightly modified form of my invention showing a portion of the handle connected to the rearward end of the barrel and containing modified electric lamp means.

More specifically, referring to Fig. 1, a hollow barrel 1, which in the example shown is of tapered, conical form, is provided with an enlarged portion 2 at the rearward end thereof, upon which is mounted a base 3, which is attached to the enlarged portion 2, by suitable fastening means such as the screws 4. The base 3 is hollow and is adapted to receive the end of a handle 5, the handle 5 being provided with a pin 6 adapted to fit into a bayonet slot 7 in the hollow base 3, so that a slight rotation of the handle 5 with respect to the base 3 will releasably lock same together. Various other locking means may be employed, if desired. The barrel 1 is also provided with a rounded nose 8 at the forward end thereof, and a removable slide 9 slidably engaged at one side of the hollow barrel 1, the slide 9 having grooves in the opposite sides thereof adapted to engage a corresponding projection in the cooperating portions of the walls of the hollow tube 1 for retaining the slide 9 in position with respect to the hollow tube 1 with one degree of freedom therebetween; that is, the slide 9 may move longitudinally with respect to the hollow barrel 1 only. The slide 9 is provided with an actuating handle 10. The forward movement of the slide 9 with respect to the hollow barrel 1 is limited by the lip 11 on the rearward end of the rounded nose 8.

The rearward end of the rounded nose 8 is tapered as shown in dotted lines at 15 in Fig. 1. The purpose of this will be explained hereinafter. The handle 5 contains electric lamp means (not shown in Fig. 1) with the lamp positioned within the hollow cup-shaped portion of the base 3 and in close proximity to the portion 2 of the hollow barrel 1. It should be noted that the hollow cup-shaped portion of the base 3 is connected at an angle to the portion 2 of the hollow barrel 1, whereby the lamp means contained within the portion 3 will direct light into the portion 2, and the light will be conducted along the barrel 1 within the walls thereof, virtually evenly illuminating the entire barrel 1, nose 8 and slide 9, which will thus cause a virtually even illumination of the entire rectal wall in contact therewith. The lamp may be energized by means of the electric input lead cord 12, which may be connected to a suitable source

of A.-C. or D.-C. potential, or the lead 12 may be dispensed with and a battery fitted within the handle 5 for energizing the lamp means. The base may be apertured to permit air circulation to cool the lamp.

A slightly modified version of my invention is illustrated in Fig. 2. In this form of my invention the rounded nose 8' is adapted to be removably attached to the forward end of the barrel 1' by means of a pin 13 fitting within a bayonet slot 14 in the forward end of the hollow barrel 1'. The reason for having the nose 8' removable is so that the proctoscope may be modified for use as an open ended proctoscope where it is desired to treat a rectal abnormality, which is forward of the forward end of the proctoscope, and the means for treatment may be passed entirely through the proctoscope from the rearward end through the forward end to the location of said rectal abnormality. When such use is not desired, the rounded nose 8' may be fitted into the barrel 1' and the device operated as a closed end proctoscope similar to that shown in Fig. 1. It should be understood that a closed end proctoscope, such as that shown in Fig. 1 or such as that shown in Fig. 2, when the rounded nose 8' is fitted within the barrel 1, is adapted for treating rectal abnormalities by removing the slide therefrom after the proctoscope has been inserted into the rectum and the slide has been positioned adjacent the abnormality to be treated. It should be noted that the rear side of the nose 8 in Fig. 1 and the rear side of the nose 8' in Fig. 2 have an angular surface indicated in dotted lines at 15 in Fig. 1 and solid lines at 15' in Fig. 2. The purpose of this is so that any pendulous masses of rectal tissue such as hemorrhoids or the like which are being treated, may be passed through the open side of the barrel through the opening created by the removal of the slide and rest on the angular surface during said treatment.

The modified version shown in Fig. 2 may also be provided with light distributing means, which in this example comprise ridges indicated at 16 on the interior side of the barrel 1' and shown in Figs. 2 and 3. The purpose of these ridges is to permit the lateral egress of light from within the wall of the barrel 1' into the interior of the barrel 1' and laterally through the opposite wall for illuminating the surrounding rectal area evenly.

Some type of light distributing means, such as the ridges 16 shown in Fig. 3 is desirable, since most of the light from the lamp means 17 entering the end of the portion 2' of the hollow barrel 1' will be conducted along said barrel 1' by reason of the hereinbefore mentioned peculiar optical properties of acrylic resins and will be emitted laterally therefrom primarily at points of surface discontinuity, irregularity and surface non-smoothness. Any type of surface irregularity might be utilized instead of the ribs 16. For example, notches or grooves, cross hatching or surface etching, or various other irregular, non-highly polished surfaces might be utilized for regulating the amount of light emitted from the barrel 1' at any point thereon, so as to provide the desired illumination of the surrounding rectal wall.

In the example, the light distributing means is on the interior of the barrel, thus causing the light to be emitted laterally from the walls of the barrel 1' into the hollow interior portion thereof and thence through the opposite wall. However, light distributing means might be provided

on the exterior of the wall 1', if desired, for directly illuminating the adjacent rectal wall. This type of light distributing means could not be in relatively rough form, such as the ribs 16, but would probably have to assume a form such as surface etching, grooving or cross hatching, so as to not be physically uncomfortable to the adjacent rectal wall.

It should be noted that there is an opening indicated at 13 in Fig. 2, between the interior of the hollow cup-shaped portion of the base 3' and the interior of the barrel 1', so that a portion of the light emitted by the lamp 17 and reflected by the reflector 19 may pass directly through the opening 13 into the interior of the barrel 1', and so that a portion of the light may enter the end wall of the portion 2' of the barrel 1' for the type of illumination hereinbefore described. The opening 13 is desirable in that it permits a certain proportion of the light to directly illuminate the interior of the barrel 1', and it further serves as a ventilating port for dissipating the heat generated by the lamp 17.

Fig. 4 illustrates diagrammatically a slightly modified form of my invention in fragmentary form. The barrel 1'' has a hollow handle 32 connected thereto by screw means 29 in the example shown. The hollow handle 32 (shown in fragmentary form) has positioned therein a parabolic mirror 21 having a lamp 22 positioned at or adjacent the focal point thereof. The lamp 22 has suitable leads 23 connected thereto for energizing same. The bottom of the parabolic mirror 21 is fixed to a stem 24 which extends through a longitudinal slot in the bottom wall of the handle 32, said longitudinal slot being fitted with a longitudinal rubber grommet 25, which frictionally grasps the stem 24. The stem 24 is provided with an actuating handle 31. Extending downwardly from the interior side of the top wall of the handle 32 is a stop 26 which abuts the top of the parabolic mirror 21 adjacent the forward end thereof.

The operation of this assembly is as follows. Normally the parabolic mirror 21 directs the light emitted by the lamp 22 centrally through the enlarged opening 18' into the hollow interior of the barrel 1''. By turning the handle 25, the parabolic mirror 21 may be rotated slightly, thus laterally moving the beam of light reflected by the reflector 21, so as to illuminate one or the other of the lateral side walls of the barrel 1''. Pushing or pulling the handle 32 for axially moving the stem 24 with respect to the handle 32 will cause the parabolic mirror 21 to pivot about a fulcrum point at the stop 26, thus vertically, angularly displacing the beam of light reflected by the reflector 21. Through a combination of these two movements of the actuating handle 31, the beam of light directed by the reflector 21 may be selectively directed through the walls of the barrel 1'' to any desired spot for selectively, intensively illuminating a selected rectal area. The grommet 25 frictionally retains the stem 24 in the selected position. Various other adjusting means for the optical system may be employed.

In addition to the lamp 22, a lamp 27 provided with a reflector 28 is held by a spring clamp 29 in immediate proximity to and directly facing the end wall of the portion 2'' of the barrel 1'' for admitting light directly into the walls of said barrel for illumination of the type hereinbefore described. Leads 30 are provided for electrically energizing the lamp means 27.

It should be noted that the structure shown in

Fig. 4 may be modified by removing the lamp 27 and reducing the size of the hole 18' so that a portion of the light reflected from the reflector 21 will enter the end wall of the portion 2'' of the barrel 1''.

Furthermore, in the example shown in Fig. 4, the two lamps 22 and 27 may be arranged to be selectively or individually energized if desired.

It should be noted that all of the versions of my invention described and illustrated may be supplied with A.-C. or D.-C. through suitable lead means or may contain suitable batteries or the like within the handle for energizing the lamp means.

The examples described and illustrated herein are exemplary only and are not intended to limit the scope of this invention, which is to be interpreted in the light of the appended claims only.

I claim:

1. A self-illuminated, transparent proctoscope, including a handle and selectively energizable, electric lamp means mounted in said handle and adapted for use in visually examining and treating rectal abnormalities, comprising: a hollow, virtually conical barrel of transparent, thermoplastic methyl methacrylate resin; a slide of the same material slidably mounted in one side of said barrel and removable from the rear end thereof; a rounded head of the same material removably attached to the forward end of said barrel and having a sloping, rearward side closing the forward end of the hollow interior of the barrel; a base attached to the rearward end of said barrel and at an angle thereto and arranged to be selectively connected to said handle containing said lamp means to position the lamp means in proximity to the wall of the barrel and allow light from said lamp means to enter and be transmitted through the walls thereof for illuminating the rectal area in contact therewith.

2. An apparatus of the character defined in claim 1 including light-distributing means carried by the inner surfaces of the walls and comprising a plurality of flat-topped ribs adapted to allow the egress of the light contained within the walls and being conducted therealong.

3. In an apparatus of the character stated in claim 1, the provision of optical means for selectively directing a beam of light from said lamp means through said walls to any desired point for selectively, intensively illuminating a selected rectal area.

4. A self-illuminated, transparent proctoscope, including a handle and electric lamp means mounted in said handle and adapted for use in visually examining the lower rectal region, comprising: a hollow, tapered barrel of transparent acrylic resin; a slide of the same material slidably, removably mounted in one side of said barrel, said barrel being provided with a rounded head at the forward end thereof; means for attaching the rearward end of said barrel to said handle containing said lamp means, whereby light from said lamp means may enter the interior of the barrel and pass through said walls for illuminating the surrounding rectal walls and whereby said light may also enter the end of the walls of the barrel and be conducted thereby throughout said walls for illuminating virtually the entire rectal wall in contact therewith; and light-distributing means carried by the walls for causing a desired quantity of the light being conducted by and within said walls at any point to pass through the wall face for properly distrib-

uting the light for more even illumination of the surrounding rectal walls.

5. An apparatus of the character described in claim 4 wherein the light-distributing means carried by the walls comprises surface irregularities on the inner surfaces of the walls adapted to emit light.

6. In an apparatus of the character stated in claim 4, the provision of means for selectively directing a beam of light from said lamp means through said walls to any desired point for selectively illuminating a selected rectal area.

7. A self-illuminated, transparent proctoscope, including a handle and a selectively energizable electric lamp means mounted in said handle and adapted for use in visually examining and treating rectal abnormalities, comprising: a hollow, virtually conical barrel of transparent, thermoplastic, methyl methacrylate resin; a slide of the same material slidably mounted in one side of said barrel for providing access to the hollow interior thereof; a rounded head of the same material removably attached to the forward end of said barrel and having a sloping, rearward, side closing the forward end of the hollow interior of the barrel; a base attached to the rearward end of said barrel adapted to be selectively engaged with said handle containing said lamp means whereby light from said lamp means may enter the end walls of the barrel and be conducted thereby throughout said walls for illuminating virtually the entire rectal wall in contact therewith; and light-distributing means carried by the walls for causing a desired quantity of light being conducted by and within said walls at any point to pass through the wall face for properly distributing the light for even illumination of the surrounding rectal walls.

8. An apparatus of the character stated in claim 7 wherein the light-distributing means carried by the walls comprises an irregular, non-smooth surface adapted to allow the egress of the light contained within the walls and being conducted therealong.

9. In an apparatus of the character stated in claim 7, the provision of mirror means for selectively directing a beam of light from said lamp means through said walls to any desired point for selectively, intensively illuminating a selected rectal area.

10. A self-illuminated, transparent proctoscope, including an opaque handle and electric lamp means mounted in said handle and adapted for use in visually examining the lower rectal region, comprising: a molded, hollow, tapered barrel of transparent resinous polymer; a slide of the same material slidably, removably mounted in one side of said barrel, said barrel being provided with a rounded head at the forward end thereof; means connecting the handle containing said lamp means to the rearward end of said barrel at an angle to the barrel and with the light in close proximity to the barrel, whereby light from said lamp means may enter the walls of the barrel and be conducted thereby throughout said walls for illuminating virtually the entire rectal wall in contact therewith; and light-distributing means carried by the inner surfaces of barrel walls for causing a desired quantity of the light being conducted by and within said walls at any

point to pass through the wall face for properly distributing the light for more illumination of the surrounding rectal walls.

11. An apparatus of the character stated in claim 10 wherein the light-distributing means carried by the walls comprises surface irregularities adapted to emit light.

12. In an apparatus of the character stated in claim 10, the provision of optical means positioned between the lamp and barrel for selectively directing a beam of light from said lamp means through said walls to any desired point for selectively illuminating a selected rectal area.

13. A self-illuminated, transparent body orificalscope, including a handle, electric lamp means mounted in said handle and adapted for use in visually examining the walls of a body orifice, comprising: a transparent, hollow barrel, provided with a rounded head at the forward end thereof, said barrel being made of transparent resin, the rearward end of said hollow barrel being open and attached to said handle containing said lamp means, whereby light from said lamp means may illuminate the wall of the body orifice in contact with said hollow barrel; and optical means for selectively directing a beam of light from said lamp means through said walls to any desired point for selectively illuminating a selected area of said body orifice walls.

14. A self-illuminated, transparent body orificalscope, including a handle and selectively energizable lamp means mounted in said handle and adapted for use in visually examining body orifices, comprising: a hollow, virtually conical barrel of transparent, thermoplastic resin provided with a rounded head; a longitudinally extending slot in the wall of said conical barrel extending from said rounded head to the opposing open end thereof; a slide slidably mounted in the slot and removable from the open end thereof; a base attached to the rearward end of said barrel and at an angle thereto and arranged to be selectively connected to said handle to position the lamp means in proximity to the wall of the barrel and allow light from said lamp means to enter and be transmitted through the walls thereof for illuminating the body orifice in contact therewith.

15. An apparatus of the character defined in claim 14, including light-distributing means carried by the inner surfaces of the hollow barrel and comprising a plurality of flat-topped ribs adapted to allow the egress of light from within the walls of such barrel.

16. In an apparatus of the character stated in claim 14 the provision of plural lamp means in said handle, one of said lamp means supplying light to the interior of said barrel and the other supplying light to the walls of said barrel.

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