Dec. 12, 1950 O. C. HOLLSTEIN 2,534,126

X-RAY SPECULA

Filed Sept. 4, 1948

Fig. 1

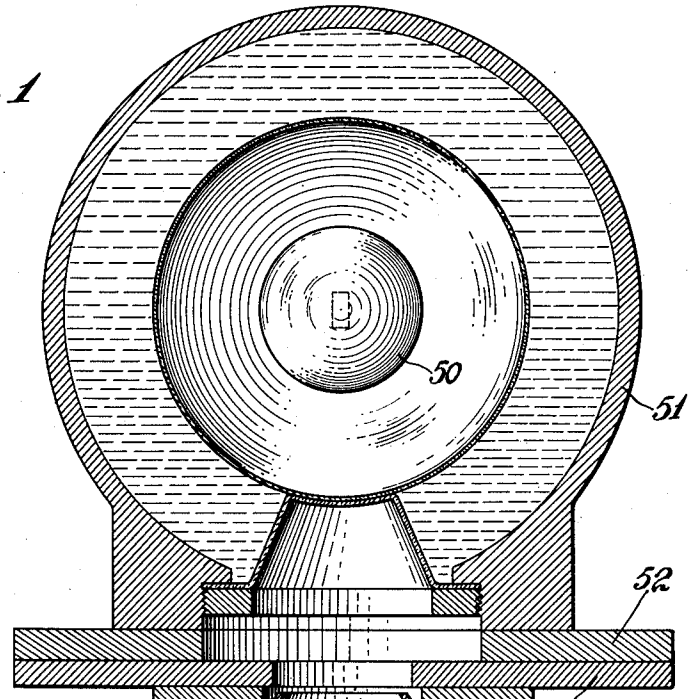
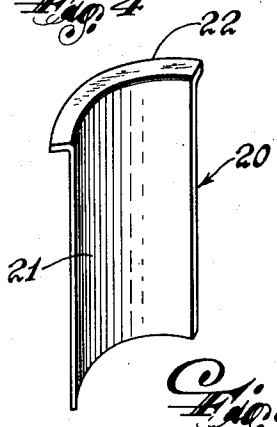


Fig. 4



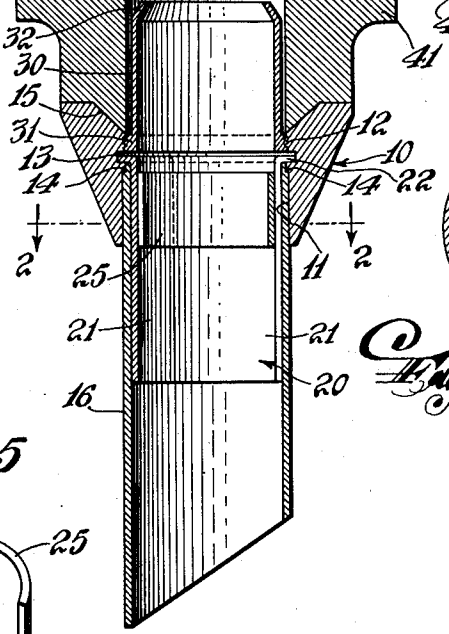


Fig. 2

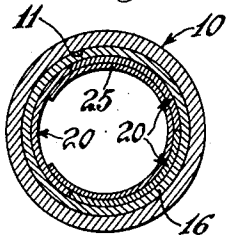


Fig. 3

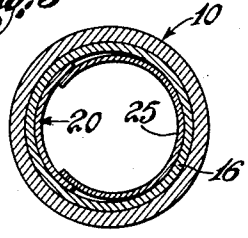
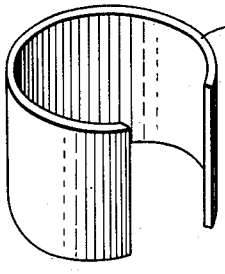


Fig. 5



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X-RAY SPECULUM

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6 Claims. (Cl. 250—105)

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This invention relates to novel articles of manufacture and more particularly to devices employed in the field of radiation and especially those concerned with X-rays. In one of its more specific aspects the invention is directed to that class of devices used in the Röntgen therapy of the cervix.

In accordance with this invention I have provided novel vaginal specula which may be employed to facilitate the Röntgen therapy of the cervix while preventing necrosis of the vulva and the vaginal introitus due to over-radiation.

The various advantages and objects of the present invention will be apparent from the following description and drawings, wherein:

Fig. 1 is a cross sectional view of the invention in combination with a source of X-rays.

Fig. 2 is a cross-sectional view taken on line 2—2 of Fig. 1.

Fig. 3 is a view similar to that of Fig. 2 but with a single X-ray shield or apron instead of the three shown in Fig. 2.

Fig. 4 is a perspective view of an X-ray shield or apron.

Fig. 5 is a perspective view of a split band or retaining ring.

As shown in the drawings, the speculum combination may include a coupling head 10. The head 10 is a frustro-conical element preferably composed of metal and having a cylindrical inside wall 11. The upper end 12 of said cylindrical wall 11 is threaded. The head 10 has a narrow circular slot 13 therein just below the lower limit of threaded end 12, and just below the slot 13 is a narrow circular shoulder 14. The internal upper end of the head 10 tapers upwardly outwardly or is inclined downwardly to provide a receiving and aligning mouth 15. A cylindrical tubing 16 is secured to the head 10 in any convenient manner. The tubing 16 may be composed of any suitable X-ray permeable material and preferably of a plastic. The tubing 16 is preferably a relatively thin walled hollow cylinder whose lower end has been cut off at an angle of about 45° to the longitudinal axis of the cylinder. The upper end of the tubing 16 may be force fitted into the lower end of the head 10 so that they are secured to each other by mere frictional engagement. In this assembly the upper edge of the tubing 16 is located below the slot 13 and is limited by stop shoulder 14. Various tubings 16 may be provided in the same diameter and of three different lengths so that each of them may be interchangeably secured to a particular head 10.

The combination of head 10 and tubing 16 may

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have one or more X-ray shields or aprons 20 demountably coupled therewith. Each apron 20 may comprise an elongated portion 21 of a cylinder having a narrow flange 22 integral therewith and extending outwardly therefrom. The aprons 20 are generally composed of lead or other X-ray impermeable material and may be readily combined with the cylinder 16 and head 10 by inserting the apron 20 therein and locating the flange 22 thereof in the slot 13. Then after the desired number of aprons are located in the tube 16 (three as shown in Fig. 2 and one in Fig. 3), an X-ray permeable split band or spring ring 25 is compressed and inserted in the tube 16 and slid over the aprons 20. The ring 25 autmatically springs outwardly to press the apron 20 against the inside face of tubing 16 to demountably maintain the apron in location. When a removal of aprons 20 is desired, the ring 25 is pulled or pushed out of the tube 16, the apron 20 is moved to remove its flange 22 out of slot 13 and slid out of the tube 16.

If desired a centering hollow cylinder 30 may be coupled with the head 10. This cylinder 30 may also be composed of metal and has an outside threaded lower end 31 and an inwardly bevelled flange 32 at its upper end. The cylinder 30 may be threadedly connected to the threaded end of the head 10 as shown in Fig. 1. If desired, the threaded end of the cylinder 30 may be screwed down so that the lower face of the head 30 bears against the upper face of the flanges 22 to maintain the shield 20 in position. However, its main purpose is to interlock the centering element 41 and the head 10 to facilitate forced sidewise movement of the centering element 41 and head 10 as one unit for the desired positioning in the vagina.

The novel assembly of head 10, tubing 16, aprons 20, spring band 25 and centering element 30 may constitute a unitary assembly. This assembly may be manipulated to locate the normally free end of the tube 16 in the desired location in the vagina, for example. Then a position fixing locator comprising an annular member 40 having a depending hollow centering element 41 secured thereto is moved into position so that the centering element 30 is inserted into the centering member 41. The free end of the centering member 41 is inclined downwardly and is complementary to the upper end of head 10 so that the lower end of member 41 is located and fits in the upper part of head 10. After the locator is placed in the aforementioned position, it is locked in position (locking elements not

shown) to maintain the aforementioned speculum assembly in position. Then the X-ray tube 50 and housing 51 are moved into position and locked to the locator through an annular member 52 secured to the X-ray tube housing.

While this invention has been described in detail it is not to be limited thereby, because it is subject to various changes and modifications.

I claim:

1. A device of the class described comprising a coupling head, an elongated X-ray permeable tube demountably carried by said head, said head having a recess therein, an X-ray shield located in said tube, means secured to said shield and extending outwardly therefrom, said means located in said recess and a split ring located in said tube and bearing against the inside surface of said shield to maintain said shield in position in said tube.

2. A device of the class described comprising a coupling head, an elongated X-ray permeable tube demountably carried by said head, said head having a recess therein, an X-ray shield located in said tube, a flange secured to said shield and extending outwardly therefrom, said flange located in said recess and a split ring located in said tube and maintaining said shield in position.

3. A device of the class described comprising a coupling head, an elongated X-ray permeable tube extending into one end of said head and demountably carried thereby, said head having a recess therein, an X-ray shield located in said tube, means secured to said shield and extending outwardly therefrom, said means located in said recess, and a tube extending into and demountably connected to the other end of said head.

4. A device of the class described comprising a coupling head, an elongated X-ray permeable tube extending into one end of said head and demountably connected to said head, said head having a circular recess therein, an X-ray shield located in said tube, a flange extending outwardly from said shield and located in said recess, and a split ring located in said tube for maintaining said shield in position in said tube.

5. A device of the class described comprising a coupling head, X-ray permeable speculum demountably carried by said head and extending outwardly from one end thereof, a tube carried by said head and extending outwardly from the other end thereof, said tube being demountably carried by said head.

6. A device of the class described comprising a coupling head, X-ray permeable speculum demountably carried by said head and extending outwardly from one end thereof, a tube demountably carried by said head and extending outwardly from the other end thereof, and a locator including a centering element, one end of said centering element being substantially complementary to one end of said head with said ends adapted to interfit, said centering element having an opening therethrough for accommodating said tube upon said interfitting of said ends of said centering element and said head.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
719,915	Waite	Feb. 3, 1903
1,600,867	Coolidge	Sept. 21, 1926
1,940,671	Anderson	Dec. 26, 1933
2,436,279	Wilson	Feb. 17, 1948