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F. H. NEWTON

1,826,284

DILATOR

Filed Nov. 16, 1928

Fig. 2. Fig. 3.

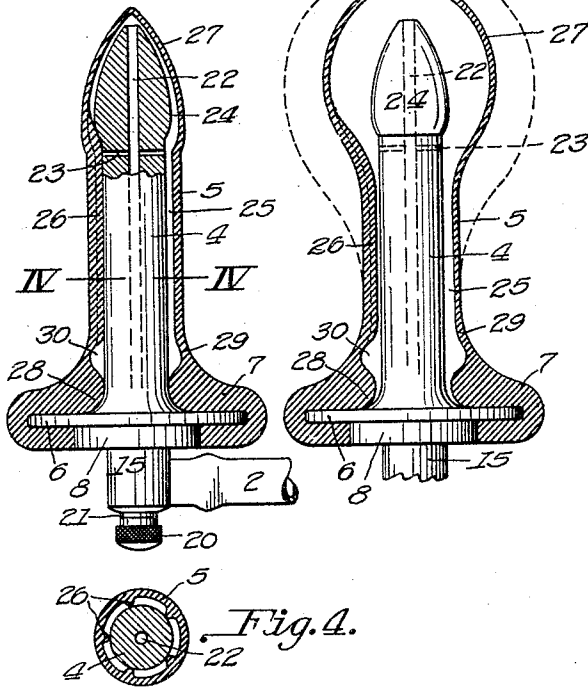


Fig. 1.

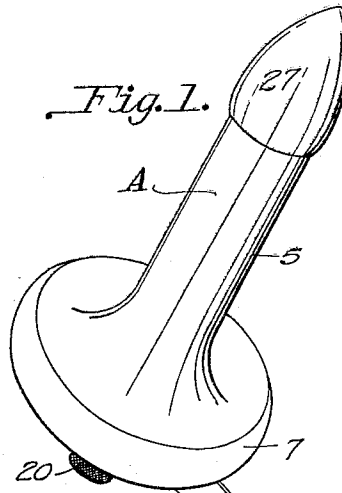
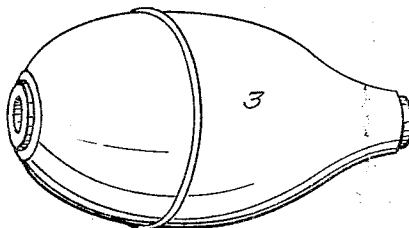
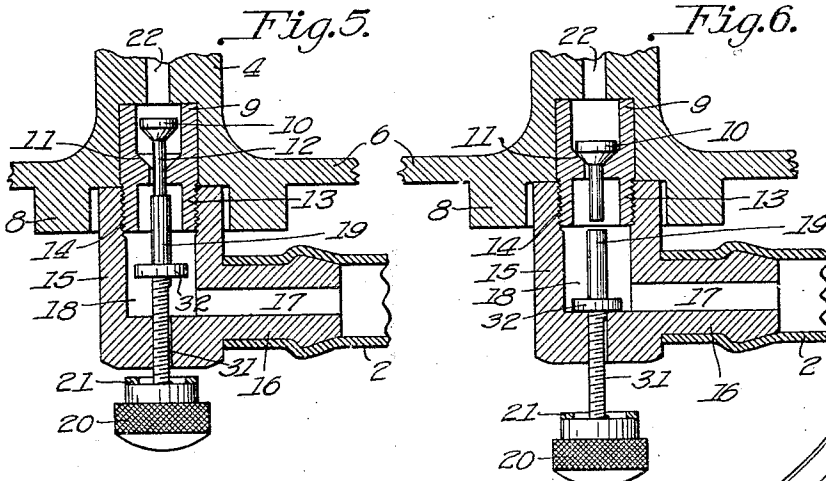


Fig. 4.

Fig. 5.

Fig. 6.



INVENTOR

Frank H. Newton
by Clark & Postelle
Attorneys

UNITED STATES PATENT OFFICE

FRANK H. NEWTON, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO THE ELECTRO THERMAL COMPANY, OF STEUBENVILLE, OHIO, A CORPORATION OF OHIO

DILATOR

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My invention relates to the class of dilators adapted for use in the rectal passage for exercise and stimulation, or in the treatment of hemorrhoids by dilation and massage of the tissue.

One of the objects in view is to provide an inflatable dilator so constructed that it may be mounted on a rigid support or applicator for insertion and inflation, with means for distending the dilator by air pressure around the applicator, and for release, by conveniently arranged valve and pressure applying mechanism; also, to so construct the dilator itself of rubber or other suitable elastic material, that it will dilate evenly all around, with an excess of expansion at the tip, and a limited expansion action at the base; with other features of improvement as hereinafter described.

One preferred embodiment of the invention is illustrated in the accompanying drawings, in which:

Fig. 1 is a view in perspective of the complete device ready for use;

Fig. 2 is a vertical longitudinal sectional view through the applicator and dilator combined and connected with the pressure applying tube;

Fig. 3 is a view similar to Fig. 2 showing the dilator partly expanded;

Fig. 4 is a cross section on the line IV—IV of Fig. 2;

Fig. 5 is an enlarged sectional view through the base of the device, showing the valve mechanism open for exhaust of air;

Fig. 6 is a similar view, showing the valve in normal operative position for application and retention of pressure.

Referring to the drawings, A generally refers to the operative portion of the invention in outside elevation, connected by a tube 2 with the pressure applying bulb 3 of well known construction, as commonly used in connection with a syringe or the like.

The combined applicator and dilator A consists of an inner supporting stem or base member 4 of hard rubber, or other suitable material, upon which is mounted the dilator member 5, made of soft rubber or other suit-

able elastic material, capable of distension and contraction.

The inner support or base member 4 is provided at its rear end with a thin annular disk 6 upon which the rear holding portion 7 of the dilator 5 is mounted, as in Figs. 2 and 3. The rear central base portion of member 4 is reinforced, as at 8, by an annularly shouldered rear extension, surrounding the central valve-receiving cavity, in which is inserted the valve casing 9, as in Figs. 5 and 6. Valve casing 9 extends inwardly of the center portion of the base, and is provided with a check-valve 10 having a limited range of movement for seating upon and unseating from the valve seat 11, for opening and closing the passage to atmospheric circulation inwardly and outwardly.

Valve 10 is provided with a rearwardly extending stem 12 projecting part-way through the central opening of an outwardly extending bushing 13, to which is attached by threaded connection 14 the inner end of a hollow terminal cage member 15.

Hose or tube connection 2 is attached to a lateral extension 16 thereof, having a communicating opening 17 leading to the interior cavity 18 of cage 15, for free supply inwardly of atmospheric air under pressure of the bulb 3. A valve unseating stem 19 is threaded in the outer end of cage 15, and is provided with a terminal knurled thumb screw actuating portion 20 and an intervening rubber gasket 21.

By releasing the stem 19, as in Fig. 6, valve 10 is rendered free to seat and unseat to receive and hold air pressure to any desired degree. When the stem 19 is inserted, as in Fig. 5, the valve will be lifted away from its seat, permitting free exhaust backwardly of the contained air, upon contraction to normal size of the rubber dilator 5, as in Fig. 2. Threaded stem 19 is flattened along one side, as at 31, for escape of air, and has a closing disk 32 for making an air tight seat when the stem is retracted, as in Fig. 6.

The applicator or supporting member 4 is provided with a central port 22 leading from the valve controlled passage clear through to the tip of the applicator, with one or more

laterally extending reduced ports 23 providing for free circulation of air at such points, either in entering or passing from the surrounding space. The tip of the applicator 4 is somewhat enlarged in diameter beyond that of its main stem portion, and formed in tapered pear-shaped, as at 24, in conformity with good practice, and providing for facility in putting the parts together and in connection with their intended use.

The dilator 5 is reinforced or thickened at its rear base portion 7, as shown, by material thickening of the walls around the disk 6, so that when in position, the device will be firmly maintained in place, and will provide a comparatively rigid annular rounded edge rim portion as a limiting stop upon insertion of the article.

The main middle body portion of the dilator 5 is in the form of an embracing tube, of comparatively thin wall section, loosely surrounding the applicator 4 and conforming to the circular cross section thereof throughout its length, with a slight intervening space 25.

For the purpose of bracing the wall 5 at intervals around the interior applicator 4, and of providing for free air circulation while the device is under pressure, and also for the further important purpose of stabilizing the dilator under pressure so that it will expand evenly all around and maintain a concentric relation to the applicator from end-to-end, the inner wall of the dilator is provided with a series of longitudinal ribs 26.

These ribs, which may be of any suitable number, as five, are equally spaced around the inner surface of wall 5 throughout its middle portion, and bear lightly against the outer surface of the shank portion of applicator 4, when the dilator is deflated. When inflated, either partially or entirely, the tubular portion will expand away from such contact evenly all around on any particular transverse plane, due to the stabilizing and strengthening action of the ribs, avoiding unequal expansion at one side or the other.

The outer portion 27 of the dilator, when contracted, generally conforms to the shape and outline of the pear-shaped terminal 24. The wall of portion 27 is slightly less in thickness than the main wall, and is preferably unprovided with the ribs, which terminate at the base of the enlargement and merge thereinto, as shown. The purpose of such difference in thickness of the wall is to permit of greater expansibility of the end portion of the dilator, when inflated, resulting in a relative enlargement thereof outwardly beyond the middle wall portion, as indicated in Fig. 3. The purpose of such construction is to provide for a massaging effect on the prostate gland, inwardly beyond the middle portion at the proper distance.

A further feature of novelty and advantage is in providing at the inner base portion of the dilator wall, immediately beyond its inner contacting engagement with disk 6, of an interior reinforced ring portion 28. Such ring portion, which is comparatively rigid, in comparison with the subsequent wall extension, is inwardly rounded as shown, merging into the main wall section 5 by an intervening comparatively thin annular connecting portion 29, outwardly beyond an inner annular channel 30.

The purpose of such construction is to provide a comparatively sluggish resilient portion of the device adapted to expand outwardly with a slight pulsating action as atmospheric pressure is applied, tending to distend the inner base portion of the dilator against the sphincter muscle, with a limited stretching or massaging effect.

Thus, in distending the applicator, its outer portion will be enlarged bulbously, with a somewhat limited distension of the middle annular wall 5, and with a slight distension of such reinforced base portion upwardly and outwardly, in conformity with the extent to which the main distending pressure of air is applied by the bulb 3.

In using the device as thus constructed, stem 19 is retracted away from interfering position with valve stem 12, by unscrewing the stem by finger terminal 20, as in Fig. 6. Thereupon, inflation pressure air is applied by operating the bulb to the desired extent, with intermittent pulsations, until the necessary distension is accomplished. Thereafter, when it is desired to discontinue application of the effect of the distended applicator, stem 19 is screwed inwardly, as in Fig. 5, positively unseating valve 10, and allowing for release of air backwardly through tube 2 and the usual escape valve of the bulb, assisted by the contractile action of the dilator walls, whereupon, the device may be removed.

Tube 2 is connected with the hollow interior of the valve casing by its attachment at right angles and closely adjacent to base 8, so that the tube is conveniently disposed with relation to the right angle center of the applicator for convenience in use, as will be readily understood.

The reinforced annular wall portion 7 of the dilator is amply stiff to maintain its grasping hold around the disk 6 when applied, but sufficiently resilient to facilitate easy application or removal for any purpose. The device as a whole is comparatively simple, cheap and durable, and very effective in its manipulation, application and use.

It may be varied in design, proportions, or in other respects to adapt it to any desired modification in use, or otherwise, by the skilled mechanic, but all such changes

are to be understood as within the scope of the following claims.

I claim:

1. A dilator of the class described comprising a centrally perforated supporting base member having a cylindrical tapered end body provided with an air inlet valve and an unseating device therefor, and an elastic covering for the base member provided with inner longitudinal ribs.

2. A dilator of the class described comprising a centrally perforated supporting base member having a cylindrical tapered end body provided with an air inlet valve and an unseating device therefor, and an elastic covering for the base member provided with an inner annular reinforcing ring-like enlargement.

3. A dilator of the class described comprising a centrally perforated supporting base member having a cylindrical tapered end body provided with an air inlet valve and an unseating device therefor, and an elastic covering for the base member provided with a rear reinforced double sided clamping flange engaging the base, a middle circular wall of reduced thickness, and a tapering tip portion of minimum thickness.

4. A dilator of the class described comprising a centrally perforated supporting base member having a cylindrical tapered end body provided with an air inlet valve and an unseating device therefor, an elastic covering for the base member provided with a rear reinforced double sided clamping flange engaging the base, a middle circular wall having inner longitudinal reinforcing ribs, and a tapering tip portion.

5. A rubber dilator for application and distension around a supporting base member as described, consisting of a laterally extending rear open-center double wall annular base for embracing attachment to an inner flange disk and having a middle tubular extension of reduced wall thickness provided with a series of inner longitudinal reinforcing ribs and a terminal tapered tip of further reduced wall thickness.

6. A rubber dilator for application and distension around a supporting base member as described, consisting of a laterally extending rear open-center double wall annular base for embracing attachment to an inner flange disk and having a middle tubular extension of reduced wall thickness, an inner annular reinforcing rib portion extending from the inner base member and merging into the tubular extension by a reduced thickness annular web portion, and a terminal tapered tip portion at the outer end of the tubular extension of relatively thin wall section.

7. A rubber dilator of the class described consisting of a closed and tapered hollow in-

section end portion, a middle tubular wall portion, and a centrally open attaching base portion consisting of a laterally extended thickened base have an inwardly extending annular ring reinforcement and a rounded peripheral edge portion turned inwardly with intervening clearance for embracing engagement around the disk portion of a supporting base.

In testimony whereof I affix my signature.
FRANK H. NEWTON.

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