

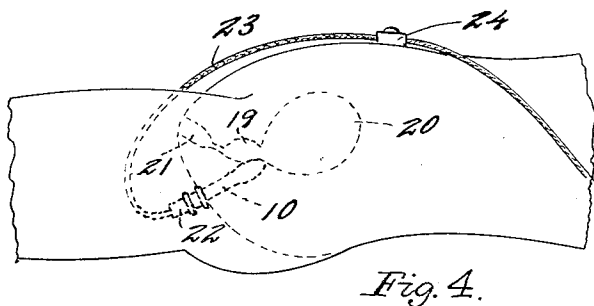
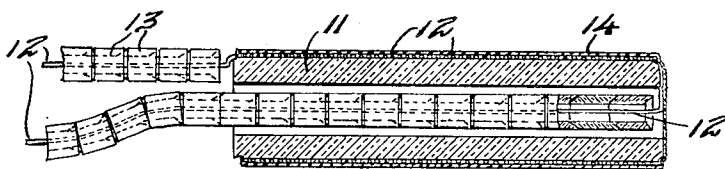
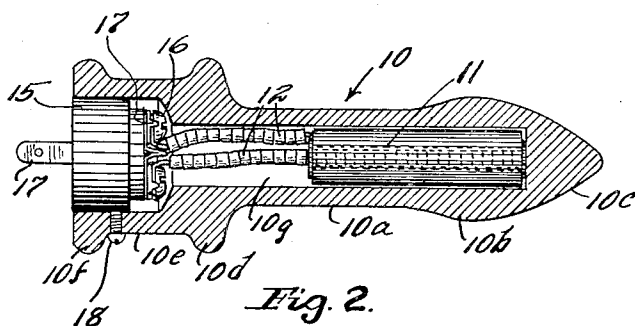
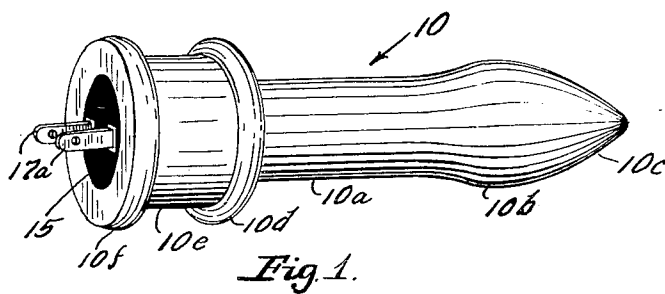
Oct. 6, 1936.

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2,056,678

APPARATUS FOR APPLYING THERMO-PENETRATION

Filed Sept. 14, 1933



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2,056,678

APPARATUS FOR APPLYING THERMO-PENETRATION

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Application September 14, 1933, Serial No. 689,411

1 Claim. (Cl. 128—303.12)

This invention relates to a method and apparatus for applying thermal penetration interiorly of the body and particularly to the prostate gland and adjacent region.

5 Carcinoma or cancer of the prostate gland is now a fairly frequent disease and according to statistics occurs in from 15 to 21 per cent of all prostates causing obstruction at the bladder neck. Heretofore it has been the opinion of
10 most urologists that a wide and clean excision offers the best method of treatment for such malignant growth. It is well known, however, that such surgery in relation to cancer often causes reinoculation in the wound by the spread
15 of the virus over the field of operation. The treatment of tumors of the urogenital tract especially prostates by excision is most discouraging. Such treatment is at best precarious and it is desirable to utilize other methods which
20 might render serious results less frequent.

It is an object of this invention to provide a simple and efficient method of applying thermopenetration to the prostate gland to produce an analgesic effect in cases of malignant growths
25 thereon.

It is a further object of the invention to provide a simple and efficient apparatus for applying thermopenetration to the prostate gland through the rectal passage.

30 It is another object of the invention to provide a simple and efficient method and apparatus for applying thermo-penetration and penetration by electromagnetic vibrations of infrared frequency to the prostate gland by disposing
35 said apparatus in proximity to said gland through the rectal passage and generating heat and said vibrations in said apparatus.

It is still another object of the invention to provide a device comprising a member of general cylindrical shape made preferably from
40 material forming a non-conductor of electricity and having a chamber therein containing a heat generating means, said member preferably having an enlarged portion at its inner end acting
45 to maintain the same in position when inserted in the rectal passage.

It is another object of the invention to provide such a device as set forth in the preceding paragraph, said member having a tapered inner end
50 and having a plug at its outer end with projecting electrodes adapted to be connected to a socket to have electric current supplied thereto.

It is also an object of the invention to provide a device adapted to be inserted in the rectal
55 passage and disposed in close proximity to the pros-

tate gland, the same comprising a substantially cylindrical member having a chamber therein, a core in said chamber of insulating material having wound thereon a plurality of turns or
5 convolutions of wire substantially equivalent to 450 turns of No. 42 wire giving a resistance of approximately 6,000 ohms and forming a heat
10 generator adapted when in contact with living tissue to produce heat not to exceed approximately 140 degrees F. and capable of producing
15 7200 aengstrom units.

These and other objects and advantages of the invention will be fully set forth in the following description made in connection with the
15 accompanying drawing, in which like reference characters refer to similar parts throughout the several views and in which:—

Fig. 1 is a perspective view of the apparatus used;

Fig. 2 is a longitudinal central section of said
20 apparatus;

Fig. 3 is a central longitudinal section of the heating element used shown on an enlarged scale; and

Fig. 4 is a view illustrating the position of the
25 apparatus when in use.

In carrying out the present invention, thermopenetration is applied to the prostate gland at the interior of the body. For this purpose a member is used adapted to lie against or in close
30 proximity to the prostate gland having therein a generator of heat and of electromagnetic waves or vibrations of infra-red frequency. While this member could be introduced and placed in its position relative to said gland in
35 various ways, as the invention is now practiced it has been introduced into the interior of the body through the rectal passage. One form of such member used is illustrated in the drawing and while it is obvious that this member could
40 take various forms, as illustrated the same is shown as a substantially cylindrical member or plug designated generally as 10. Said member has an intermediate portion 10a of cylindrical
45 form, the inner end of said member being of larger diameter to form an enlarged portion 10b merging gradually into portion 10a and the inner end of said member is tapered to a dull point as shown at 10c. At the rear end of portion 10a
50 said member has a bead 10d extending thereabout, of much greater diameter than portion 10a and a cylindrical portion 10e extends rearward from bead 10d, being of somewhat smaller diameter than said bead and another bead 10f
55 extends circumferentially about said member at

its rear end being of substantially the same diameter as the bead 10d. Member 10 has a chamber 10g therein illustrated as of general cylindrical form and a core 11 is disposed in said chamber. The member 10 preferably is made of material forming a non-conductor of electricity and a conductor of heat. While various materials might be used, in the practice of the invention, member 10 has been made of wood. The member 11 is made of insulating material preferably of some vitreous material. Member 11 has wound thereon a multiplicity of turns or convolutions of a wire 12, one end of which passes along one end of the core 11, through the central opening thereof and out at one end of said core, the other end of said wire extending from the outer side of said core at one end of said core. Wire 12 at its exposed portions is preferably covered with small beads 13 of hard insulating material constructed to have therein ends fitting together and relatively movable thus forming a flexible covering. A coating 14 of insulating material is wrapped or placed around the wire so as to thoroughly cover the same and hold the turns or convolutions in place. The ends of wire 12 are connected to binding posts on a plug 15, said binding posts comprising screws 16 having slotted heads beneath which the ends of wire 12 are secured. Said wires are held by said screws in contact with electrodes 17, each of which has a prong 17a projecting at the outer end of plug 15. Prongs 17a are adapted to be inserted into an electric socket to be supplied with electric current. Plug 15 fits into an enlarged recess in the outer end of plug 10, having its outer end flush with the outer end of plug 10 and preferably being held in place by a small screw 18 extending through the side of plug 10.

In carrying out the above referred to method, the plug 15 is connected to a socket 22, usually attached to a cord 23, which will be supplied with suitable current and the plug 10 will then be inserted into the rectal passage, the same being inserted substantially to the bead 10d. Cord 23 is shown as provided with a switch 24. The prostate gland, indicated as 19 in Fig. 4, is a musculo-glandular organ which surrounds the neck of the male bladder 20 and the beginning of the male urethra 21. It is situated in the pelvic cavity behind the lower part of the symphysis pubic, and above the deep layer of the triangular ligament, its posterior surface resting on the rectum. Behind the prostate, separating it and the seminal vesicles from the rectum, there is a transverse oponeurosis known commonly as the Fascia Denonvillier. This layer is attached below and anteriorly to the apex of the prostate in the triangular ligament united to the peritoneum which descends between the bladder and the rectum. This last union is, as marked, as though there existed continuity of tissue and explains the constancy of the rectovesical cul-de-sac (Douglas' fosca). On each side of this fascia is attached the lateral oponeurosis described above. By its posterior surface it is but loosely attached to the seminal vesicles and to the true capsule of the prostate gland. The texture of this membranous lawer is said to resemble that of dartos. All these surrounding prostatic fasciæ make up the prostatic bed and these serve to control the direction and spread not only of suppuration but also of malignancy in this area. Besides these oponeurosis described above, the prostate has a true capsule of its own which sends prolongations between

the glandular lobes. From the pioneer work of Lowsley, it appears that cancer of the prostate develops primarily in the posterior lobe and when the lateral and median lobes are involved, this occurs secondarily from an extension of the process in the posterior lobe. Cancer of the prostate may be of slow growth over a long period well confined within the capsule of the prostate. Several years may elapse before the periprostatic structures and seminal vesicles are greatly involved. From the best authorities it is generally understood that the disease apparently remains well encapsulated for a fairly long period. Unfortunately on account of this obscure position and often indefinable symptoms, its diagnosis is lamentably delayed. Since the rectum is so easily separated from the dense fascia which locks the cancer securely in its bed, it seems that the most rational method of attack is by way of perineum, for with proper exposure the cancerous tissue is brought directly beneath the finger without disturbing or in any way spreading the smoldering malignancy.

When the member 10 is inserted in the rectum, the inner part of portion 10a and the portion 10b lie substantially against the prostate gland and the posterior lobe and the capsule above referred to. The position is illustrated in Fig. 4 where it will be seen that the plug lies substantially centrally of the prostate gland and at the posterior thereof and in close proximity thereto. These parts of member 10 are therefore, brought substantially into contact with the tissue forming the center of the malignant growth. The enlarged portion 10b acts to prevent recession of member 10 and maintains the same in its proper position within the rectum. Current being supplied to wire 12, heat is generated within the member 10 and the construction described also acts as a generator of electromagnetic waves or vibrations of infra-red frequency. This heat and said waves pass out through the member 10 and penetrate the affected tissues. This application and penetration are most beneficial. The thermo-penetration is applied at intervals and after the member 10 has been in position for from 20 to 40 minutes the same is removed. The method can be practiced without any great discomfort to the patient.

The most important effect of thermo-penetration is the production of localized internal heat. It is well known that increased heat within living tissues results in an active hyperemia and the special characteristics of thermo-penetration permits deep heat and an accurate directability to the rectal structures desired. The present method directs the penetration to a region where the action is very efficient. Bier has shown that hyperemia has distinct analgesic, bacteriacidal, absorptive, solvent, and nutritive effects. The analgesic effects of the hyperemia results from heat generated in living tissues ideally effected by thermo-penetration. By the present method heat may be localized within the depths of areas heretofore inaccessible to external heat and where the best results can be obtained. The actively circulating heated blood causes absorption of the products of inflammation, promotes tissue oxidation, stimulates metabolism and by the ultimate relief of congestion and by increased tissue drainage gives relief from pain. It is possible that the hyperemia produced within the neurone pressure region is the result of a specialized effect of

thermo-penetration upon sensory nerve endings. The body tissues react to injury and infection by a process known as inflammation. If injury occurs without infection, the type of inflammatory reaction which results is a physiological process which tends to increase metabolism and cellular activity in the injured region, thereby hastening repair. When inflammation is due to infection there is also increased metabolism accompanied by localized or generalized increase in temperature. Geyser has pointed out that inflammation is nature's attempt to cure and its principal factor is the production of heat. By means of thermo-penetration, physiological heat is generated within the tissues thereby assisting nature to react and cure disease.

The natural method of increasing the heat of the body is called "fever". Thermo-penetration by the present method produces a localized fever which can be controlled as desired. The artificial general pyrexia resulting from thermo-penetration differs from ordinary pyrexia in that it is not produced by toxins circulating in the blood stream. After cessation of treatment the heat regulating mechanism quickly eliminates the excess heat and the temperature returns to normal. The absorptive effect of the localized hyperemia produced by thermo-penetration is brought about by increasing the quantity of water and water soluble bodies, that are carried away from the edematous tissue through vascular channels. The solvent effect produced by thermo-penetration hyperemia is presumably brought about by causing increased chemical action or hyperemic increase of phagocytic action upon partially organized clots or fresh calcareous deposits.

The heat and electromagnetic emanations produced must, of course, be nicely controlled. It is not desired to have the temperature rise above 140 degrees F. Carcinoma cells, in fact,

can be destroyed by exposure to a temperature of substantially 110 degrees F. from 24 to 48 hours.

The treatment by the present method is continued at intervals for several months.

The method has been demonstrated in actual practice and has been quite successful. It has been used by several reputable physicians and they are enthusiastic about it.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the apparatus and in the steps and sequence of steps of the method without departing from the scope of applicant's invention, which generally stated, consists in a method and apparatus capable of carrying out the objects above set forth, such as disclosed and defined in the appended claim.

What is claimed is:—

A device for applying thermal and electromagnetic penetration to the prostate gland having in combination, a substantially cylindrical plug having an enlarged inner end tapering to a blunt point, said plug having a cylindrical chamber in its inner portion, a hollow cylindrical member of vitreous insulating material, a coil of wire wound on said member, one end of said coil extending through said member, said plug having an enlarged chamber in its outer end, a block of insulating material secured in said chamber, spaced electrodes secured in said block projecting from the outer end thereof, the wires from the ends of said coil extending to and being respectively secured to said electrodes and flexible insulating tubes covering said wires extending from the ends of said coil and a covering for said coil, said member, coil and covering substantially fitting in the inner end of said cylindrical chamber.

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