

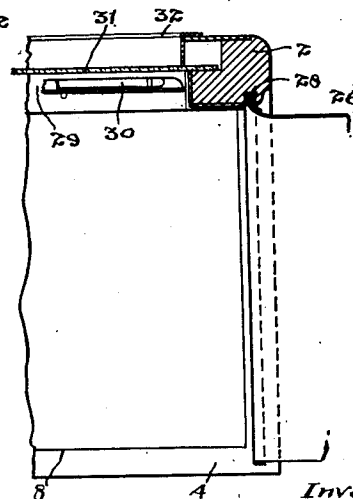
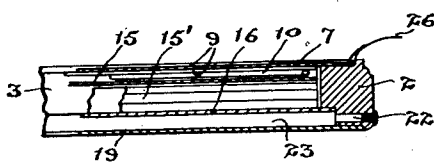
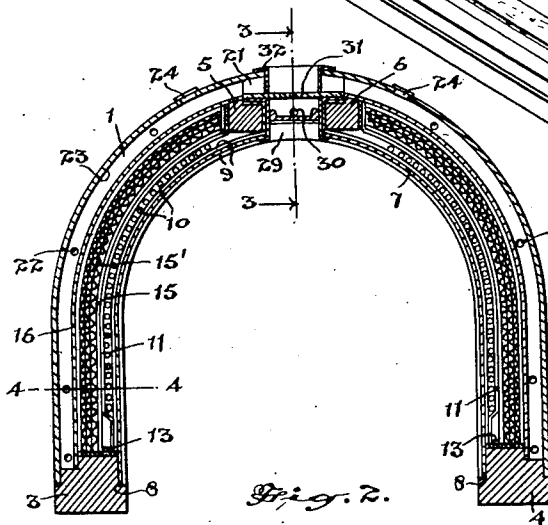
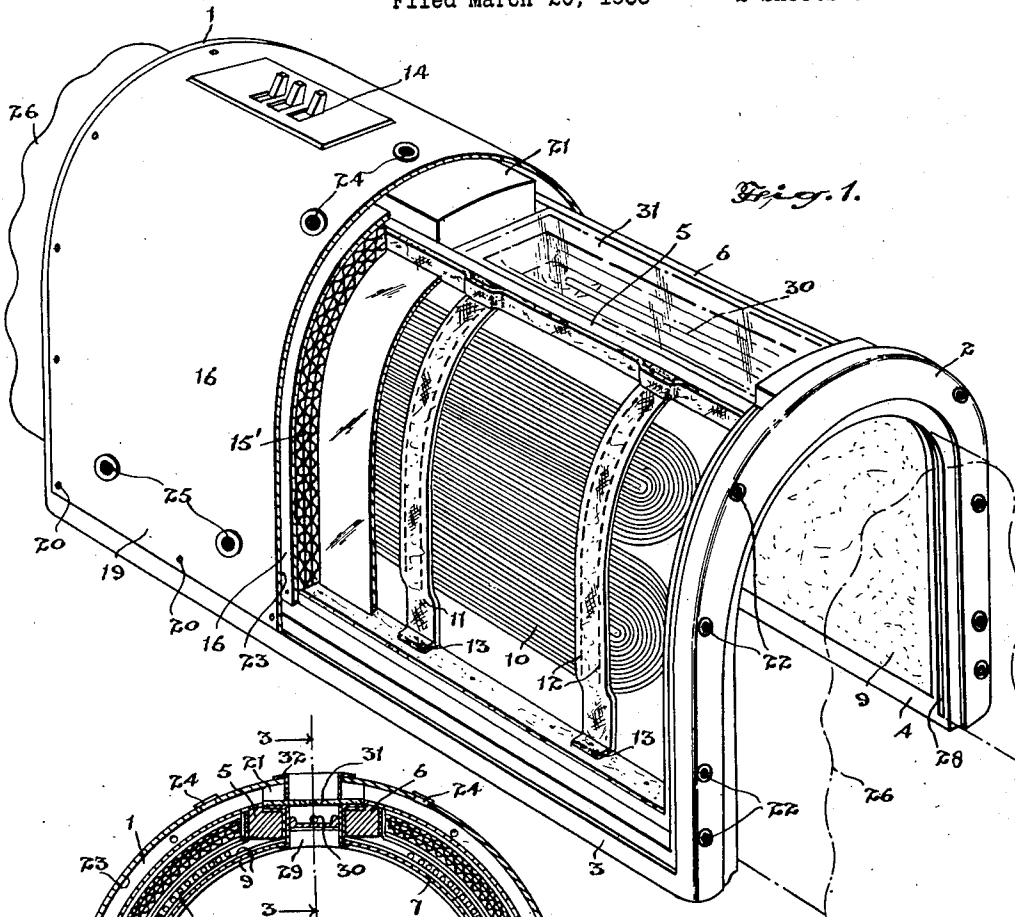
July 31, 1934.

W. H. COOKE ET AL
THERAPEUTIC TREATMENT DEVICE

1,968,015

Filed March 20, 1933

2 Sheets-Sheet 1



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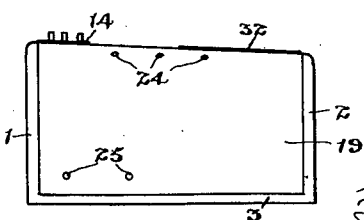
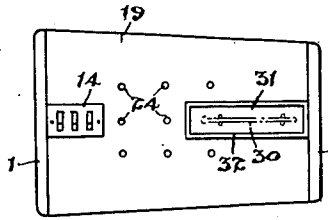
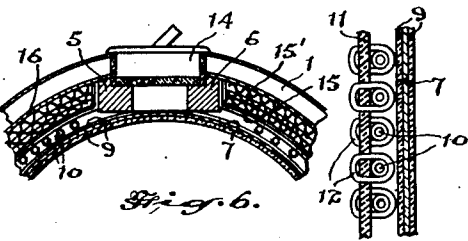
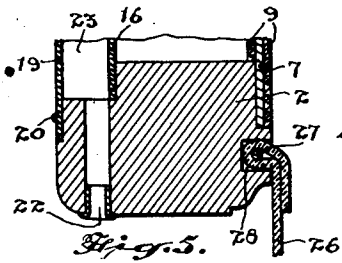
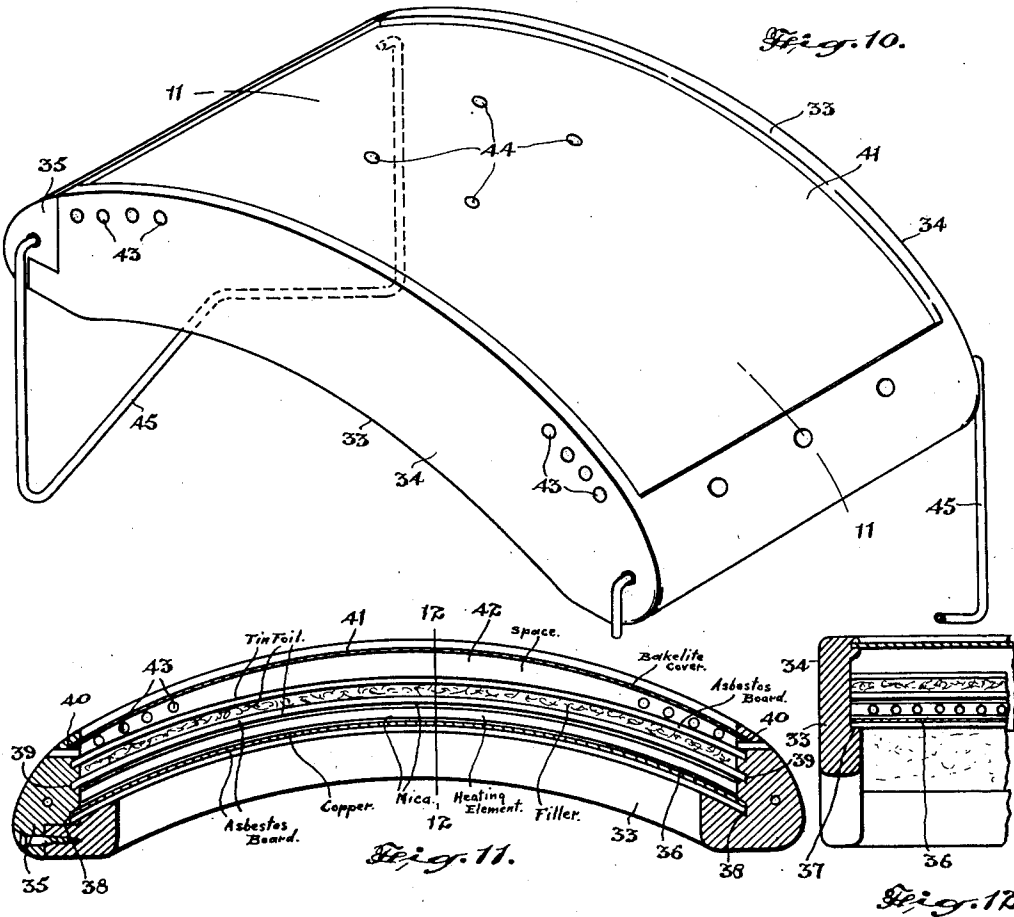
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THERAPEUTIC TREATMENT DEVICE

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

1,968,015

THERAPEUTIC TREATMENT DEVICE

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Application March 20, 1933, Serial No. 661,724

8 Claims. (Cl. 174—177)

The principal objects of this invention are to improve the conditions under which the heat treatment of parts of the body may be effectively accomplished without discomfort or danger to the patient of being burned or startled by accidental contact with hot surfaces, and to provide a form of cabinet for confining the portion of the body to be treated in such a manner that the effective therapeutic qualities may be utilized to the best advantage.

A further and important object is to devise a construction of apparatus which will be dependable in its operation, will not be subject to early deterioration, will have its exterior parts thoroughly insulated from the heat and will present a very desirable appearance.

The principal features of the invention consist in the novel formation of a cabinet of a substantially arched or inverted U shape which may be readily placed over a portion of the body or limb to be treated, and in the arrangement of curtain closures at the ends when it is desired to form a substantial seal to the chamber enclosed by the casing.

A further and important feature consists in the novel manner of supporting the coils of the heating element by straps of insulating material and enclosing same within a heat insulating casing.

A still further and extremely important feature consists in the novel construction of the casing, whereby an air chamber is arranged immediately beneath the outer shell and provision is made to ensure a circulation of an insulating stratum of air under the outer wall of the casing while it is in use to prevent the transference of heat from the inside structure to the outer wall.

In the drawings, Figure 1 is a sectional perspective view of a device constructed in accordance with the present invention.

Figure 2 is a cross sectional view taken through Figure 1.

Figure 3 is a fragmentary vertical mid-sectional view through one end of the device taken on the line 3—3 of Figure 2.

Figure 4 is a fragmentary sectional detail through the side wall of the device taken on the line 4—4 of Figure 2.

Figure 5 is an enlarged cross sectional detail of the end member shown in Figure 4, illustrating the arrangement of the air circulating passages and the manner of mounting the flexible hood.

Figure 6 is a fragmentary cross sectional view

showing the manner of mounting and insulating the switch member.

Figure 7 is a cross sectional detail through a portion of the heating element enlarged.

Figure 8 is a miniature elevational view showing the preferred shape of the device.

Figure 9 is a miniature plan view.

Figure 10 is a perspective view of a modified form of the device.

Figure 11 is a section through the line 11—11 of Figure 10.

Figure 12 is a vertical mid-section through the line 12—12 of Figure 11.

The value of heat treatment in rheumatism, neuritis and other kindred ailments is well recognized and many types of apparatus have been devised for this purpose.

The present invention proposes a particularly efficient construction for carrying out such treatments.

In the form of the device illustrated in Figures 1, 2, and 3 of the drawings a light frame is provided composed of a pair of arched end members 1 and 2 suitably spaced apart and rigidly connected at their ends by a pair of longitudinal members 3 and 4, the latter members forming the base upon which the device is adapted to rest.

A pair of parallelly arranged longitudinal members 5 and 6 rigidly connect the upper part of the inverted U-shaped end members.

A thin partition 7, preferably of sheet copper, bent into conformance with the arch of the end members is secured at the ends and side edges to the end and longitudinal members respectively, on the inner side of the frame, the bottom edges fitting in the recesses 8 in the longitudinal members 3 and 4.

The partition 7 is covered on its inner and outer sides by sheets 9 of asbestos, or other suitable insulating medium.

Electric heating elements 10 are placed over the outer asbestos sheet 9 in extended heat exchange relation thereto. Such heating elements are preferably composed of suitable lengths of insulated resistance material and are bent into looped configuration of a single thickness so that a unit is formed presenting a length and width such as to fit between the ends and longitudinal members of the frames on either side thereof.

The manner of looping and mounting the resistance elements is an important factor and it will be noted that a plurality of straps 11 of insulating material, such as asbestos, are positioned transversely of the looped elements and the coils of the latter are firmly locked in position there-

on by staple members 12, which extend through the straps and loop around the elements.

The ends 13 of the straps are secured to the upper and lower longitudinal frame members so that the heating members will be firmly held in position and may when occasion demands be readily removed and replaced by a similar built-up element.

A suitable selective control switch 14 is secured, preferably between the longitudinal top members, as shown in Figure 6, and a suitable arrangement of wiring, not shown, connects the heating elements with the selective switch so that any desired portion of the heating element or all of it may be utilized.

It is desirable to restrict the outward travel of heat from the elements 10 and a thin sheet composed preferably of mica 15 is placed directly over the elements and this not only serves to insulate but effects an inward reflection of the heat rays.

Overlying the mica sheets are a plurality of layers of insulating sheets 15', preferably of corrugated asbestos, which are held in place by an overlying sheet 16 preferably of bakelite. It is desirable to utilize with the heat insulating coverings sheets of bright metal foil which reflect back the heat rays.

It will be noted that the outward edges of the frame are recessed so that the outer surfaces of the overlying sheets 16 are depressed below the extreme outer edges of the frame.

An outer sheeting 19, preferably of thin bakelite or other suitable material is bent over the end members 1 and 2 in the manner shown, and its bottom edges are secured by fastening means 20.

The sheeting 19 is supported at the top intermediate of its length by a block 21 and is thus spaced a substantial distance from the underlying sheets 16 forming air spaces extending over the major area of the device and directly opposite the elements 10, thus forming a heat insulating space.

Provision is made to enable a cooling circulation of air through the insulating space referred to and this is accomplished by providing a plurality of openings 22 extending through the end members in register with the insulating space 23 and air is thus free to flow into the space 23 to find egress through the vents 24 disposed in the upper region of the outer shell 19.

A plurality of air inlet ducts 25 are also provided in the shell 19 communicating with the bottom of the chamber 23. A very effective circulation of air is thus established through the chamber or passage 23 to carry off any heat which may penetrate the insulating structure overlying the heating elements.

The ends of the device are provided with flexible hood members 26, these being secured to the respective end members by means of a length of spring wire 27 which is sprung into the recess 28 here shown formed in the inner arched wall of the end, to hold the underlying edge of the hood in place.

The hood members are adapted to snugly embrace the leg or arm of the patient under treatment to form a substantial seal at each end of the device, while the afflicted portion of the limb is under treatment, and if it be desired not to extend the limb completely through the device, one end may be closed by the hood members.

It is important to note, as shown more particularly in Figures 8 and 9, that the device is constructed to present a greater width and height

at one end than at the other. The proportioning of the device in this manner provides for the most effective placing of same in regard to the tapering shape of the limb, particularly when treatments are confined to the knee region.

It is desirable that an indication be given of the true operating temperature obtaining within the device and an opening is formed through the partition 7 at the top between the upper longitudinal members 5 and 6 and a thermometer 30 is supported within the said opening and covered by a sheet of glass 31, or other transparent medium which is held in place by the rectangular rim member 32.

In addition to providing an accurate determination of the prevailing temperature within the device, the opening 29 may be utilized to visualize the reaction of the afflicted portion of the limb while under treatment at the temperature indicated without disturbing the end closures.

The construction of a device such as described open at one side for its full length permits its application or adjustment with the minimum of discomfort to the patient, the device being simply placed down over the exposed limb which is a distinct advantage over structures now in use where it is necessary to insert the limb into a tubular structure.

A modified structure is shown in Figures 10, 11 and 12 which is particularly adapted for local heat applications to the body and is of such a nature that it can be used without danger of burning the patient.

The frame consists of the thin flat arches 33 connected by the straight sides 34 one of which is formed with a detachable portion 35. The inner metallic plate 36 with its insulating coverings engage a shoulder 37 formed in the arched sides 33 and the ends of the plate and coverings are held in grooves 38 in the end pieces. Other grooves 39 and 40 hold the insulating coverings on the outer side of the heating elements which includes bright metal foil and the outer cover plate 41 is spaced from its next adjacent sheet and forms the air chamber 42.

Openings 43 are arranged in the arched sides and openings 44 are provided in the cover plate 41 to provide a circulation of air through the air chamber.

Hinged brackets in the form of wire loops are arranged on the side members 34 for supporting the heater clear of the patient's body when desired.

It will be understood that many variations may be made in the actual details of structure in carrying the present invention into effect.

The importance of providing for adequate cooling of the outer surfaces of a device of this nature cannot be over-estimated, and the construction defined enables prolonged and continued functioning without fear of shocks by contact of the patient with the outer exposed surfaces, and in addition to providing an insulating air space it is desirable to provide a white or bright surface on the inner face of the shell 19 which will reflect back any heat rays which may have penetrated through the inner structure.

The whole structure is extremely rugged and dependable and may be finished in suitable colors or grained effect to harmonize with the surrounding furniture or equipment, or finished in the ordinary manner employed in furniture construction by reason of the cooled temperature at which the outer surfaces of the device is maintained.

What we claim as our invention is:—

1. A therapeutic treatment device, having in combination a heating element, a metallic heat radiating element underlying said heating element, and heat insulating means overlying said heating element and including interposed bright metal foil for reflectively returning outwardly radiated heat rays.
2. In a therapeutic treatment device, in combination, a heating element, a series of reflective foil sheets arranged at one side of said heater and spaced from said heating element, and a relatively thick fibrous heat insulating medium confined between said heater and foil sheets and retaining the respective reflective foil sheets out of physical heat exchange contact.
3. In a therapeutic treatment device, in combination, a heat absorbing and radiating wall, a low power heating element closely overlying the major area of said wall and electrically insulated therefrom, and a series of ray-reflecting bright metal foil sheets separated by relatively heavy fibrous heat confining layers of insulating material disposed on the outward side only of said heating element, said series of separated foil sheets serving to multiply the inward concentration of heat rays toward said heat absorbing and radiating wall and the heavy intermediate layers of fibrous material serving to maintain the series of foil sheets out of heat interchange contact and minimizing free convection air currents therebetween.
4. In a therapeutic treatment device, in combination, a thin heat absorbing and radiating wall, a mica board closely overlying the outer side of said wall, a low power heating element overlying the major surface area of said mica board, a second mica board closely overlying the outer side of said heating element, a series of heat-ray-reflecting metal foil sheets disposed in spaced relation the one to the other on the outward side of said outer mica board, and fibrous heat insulating media interposed to prevent heat interchange contact of the series of foil sheets and minimizing the formation of detrimental heat conducting air currents between the foil sheets, said mica boards enclosing the heating element and acting as a filter medium for the direct and reflected heat rays.
5. A therapeutic treatment device having in combination, a copper ray transmitter or radiator, an asbestos covering on the inward side of said transmitter, a mica covering on the outer side of said transmitter, a low power heating element of extended form closely overlying the major area of said mica covering, heat insulating means overlying the outer side of said heating element and including a series of ray-reflecting bright metal foil sheets spaced the one from the other out of physical heat interchange contact and effecting a return multiplication and concentration of the outwardly directed heat rays back to said copper ray transmitter through

the mica covering thereof, said mica thereby acting as a filter medium for the direct inward and multiple reflected rays, and means providing a cooling circulation of air on the outward side of said heat insulating means.

6. A therapeutic treatment device, having in combination, a metallic heat-ray transmitter or radiator, an asbestos covering on the inward side of said transmitter, a mica covering on the outer side of said transmitter, a low power heating element of extended form closely overlying the major area of said mica covering, a mica board covering the outer side of said extended heating element, a sheet of asbestos overlying said latter mica board, a sheet of bright metal foil arranged on one side of said asbestos sheet, a filler of loose fibrous material forming a heavy insulating layer on the outer side of said latter asbestos sheet, a second asbestos sheet overlying the outer side of said loose fibrous layer, a bright metal foil sheet interposed with said asbestos sheets, and an outer casing wall spaced from the latter elements and forming therewith an air circulation passage, said passage being open to atmosphere for the purpose of providing a free air circulating therethrough to carry off to atmosphere any remaining heat values that may have penetrated to the outer side of said composite insulating structure whereby the device may be maintained in use for considerably extended periods without building up objectionable external temperatures.

7. A therapeutic treatment device, having in combination a heating element, a metallic heat-radiating element underlying said heating element, heat insulating means overlying said heating element and including interposed bright metal foil for reflectively returning outwardly radiated heat rays, and means forming an air circulating chamber on the outward side of said heating element, said chamber being in communication with atmosphere for the sole purpose of maintaining a circulation of fresh cooling air therethrough to prevent the building up of excessive external temperatures and thereby permit continuous treatment for prolonged periods.

8. A therapeutic treatment device, having in combination a heating element, a metallic heat radiating element underlying said heating element, heat insulating means overlying said heating element and including interposed bright metal foil for reflectively returning outwardly radiated heat rays, said device being of arched form and having an air circulating passage extending therearound, and air inlet and outlet ducts leading to and from said air circulating passage at the bottom and top respectively for the sole purpose of maintaining a free circulation of cooling air therethrough to permit extended use without excessive external temperature.

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