

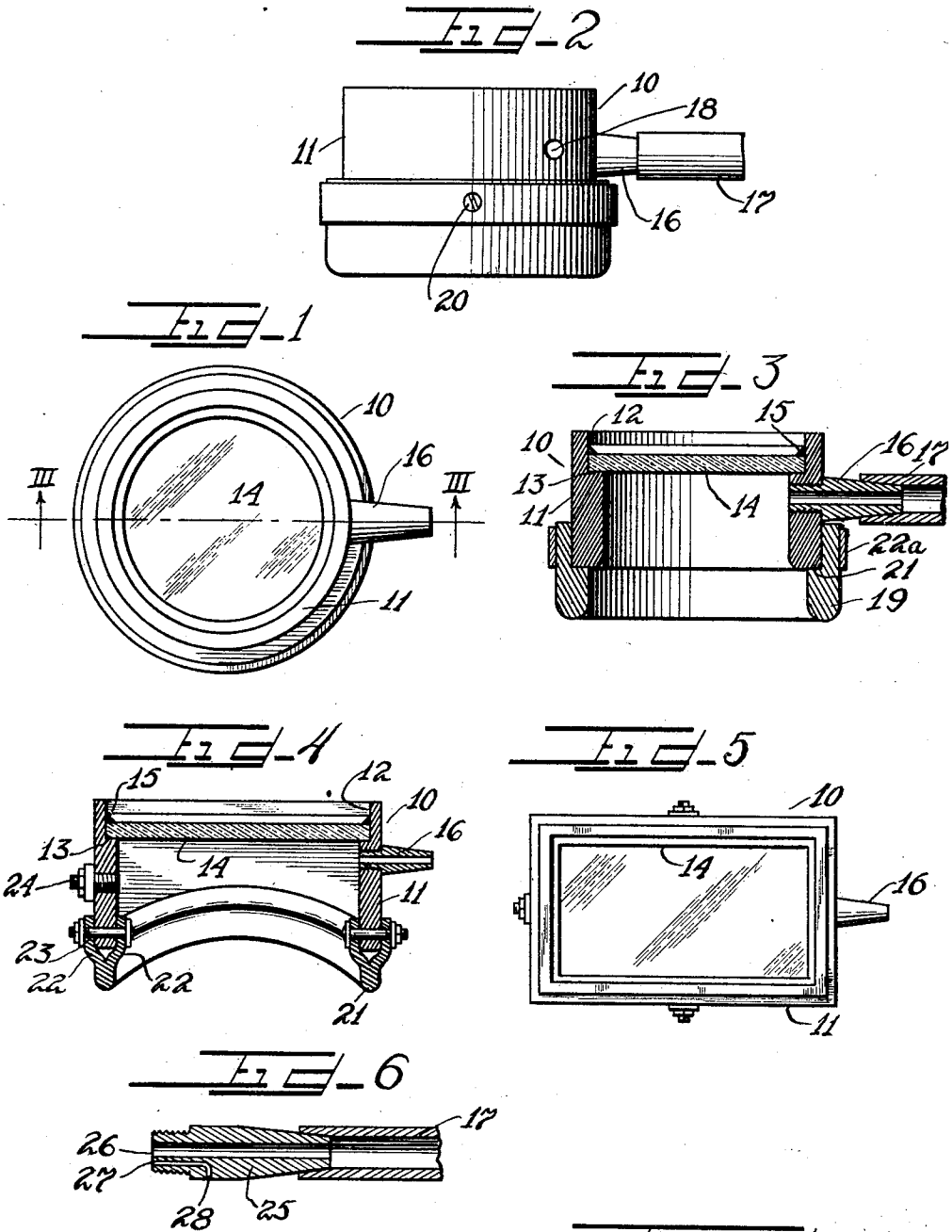
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VACUUM CUP

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# UNITED STATES PATENT OFFICE

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## VACUUM CUP

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This invention relates to vacuum cup for use in connection with violet and other ray treatments of the human body to subject a localized portion of the body to the action of the rays, while at the same time putting that portion of the body under reduced air pressure.

It is an object of my invention to provide a vacuum cup that may be applied to a localized portion of the human body to draw blood to the surface of such localized portion so that it may be more effectively treated with rays passing through the cup to the body.

It is also an object of my invention to provide a vacuum cup which will confine the rays passing therethrough so that only that portion of the body enclosed by the cup is subjected to the action of the rays.

It is a further object of my invention to provide a vacuum cup adapted for connection to air-exhausting machines but with simple means whereby the air-pressure in the cup may be readily controlled without necessitating control means for the air-exhausting machines.

It is an important object of my invention to provide a vacuum cup having means whereby parts of the human body may be massaged by being subjected to a pulsating sub-atmospheric pressure to stimulate the flow of blood to the surface of the body.

It is a further object of my invention to provide a vacuum cup of simple and inexpensive construction so that the cost of large cups for treating large areas of the human body will not be prohibitive.

Other and further important objects of this invention will become apparent from the disclosures in the following description and claims.

In the accompanying drawing which illustrates a preferred embodiment of this invention and in which similar reference numerals refer to similar features in the different views:—

Figure 1 is a top plan view of a cup embodying the principles of my invention.

Figure 2 is a side view in elevation.

Figure 3 is a sectional view of the same taken along the line III—III of Figure 1.

Figure 4 is a sectional view of my cup showing a modified form of gasket.

Figure 5 is a top plan view of my cup showing an alternative shape of my cup.

Figure 6 is a sectional view of a modified form of nipple for connecting my cup to air-aspirating systems.

In the drawing the numeral 10 indicates generally a vacuum cup of a shape to enclose an area of the human body to be treated by ultra-violet or other light rays. The cup 10 includes a casing 11 of a material substantially opaque to ultra-violet rays or other light rays, and the casing has a portion of increased bore 12 so that an internal shoulder 13 is formed therein to support a glass disc 14 to close one end of the casing. The disc 14 is sealed in position by a layer of cement 15 applied about its edge, or by any other suitable sealing means.

The casing 11 is apertured in its wall and a nipple 16, for connection to an air-exhausting machine through a hose 17, is threaded in the aperture.

In order that the air-pressure, below atmospheric pressure, may be readily controlled by the operator without necessitating the manipulation of control valve means in the air-exhausting hose lines or the manipulation of control means affecting the running of the air-exhausting machinery I have provided an aperture 18 in the wall of the casing which is adapted to be covered by the finger of the operator.

It is obvious that by more or less completely covering the aperture by his finger the operator may nicely regulate the rate at which air-pressure is reduced when the cup is connected to an air-exhausting system and is in contact with the body of a patient.

An important advantage of my means for controlling the air-pressure in the cup resides in the facility with which the air pressure may be reduced so that the cup may be brought out of contact with the body of a patient.

When the usual form of vacuum cup, a breast-pump for instance, is used, and the skin within the treated area of the body is drawn into the cup to tightly seal one end of

it, the manipulation of the cup or of adjacent skin so as to admit air into the cup to permit its being removed not infrequently causes pain. When the means I have disclosed are employed it is a simple matter to uncover the aperture 18 so that air is admitted to the cup to release it, and also to control the rate of air admission so that the treated parts may return to their normal condition gradually and without causing the patient any pain.

In order to stimulate the flow of blood to the surface I find it highly advantageous to intermittently cover and uncover the aperture 18 so that a pulsating subatmospheric pressure is obtained on the parts treated to gently massage these parts.

A conventional form of valve 24 may be inserted in the aperture 18, as shown in Figure 4, to be manipulated by the fingers of the operator, or to be so balanced as to intermittently admit air to the cup to massage the treated parts.

It will be understood that when no more is sought than the massaging of parts of the body, any suitable form of vacuum cup may be used which is apertured to provide inlet means to be intermittently covered and opened by the operator, or with a suitable valve arranged to do so automatically. I prefer the arrangement shown in Figure 1 because it is a simple matter to control the pressure in the cup by the finger of the operator when the cup is held in his hand.

The casing 11 may be slightly recessed about the aperture 18 to form a seat for the tip of the operator's finger. The casing is, in effect, a valve seat when the operator's finger is the valve.

In Figure 6 I have shown a nipple 25 which may be of such a length and shape as to form a handle for the cup, and which has the usual air conduit 26, and an additional conduit 27 for communicating with the interior of the cup and which opens to the atmosphere at the inlet 28. With a nipple of this form the inlet 28 may be covered by the thumb of the operator as he holds the handle in his hand.

The inlet 18 may be then suitably plugged; or it may be fitted with a valve to intermittently admit air so that the advantages of both automatic and manual control may be obtained.

In order that a resilient and air-tight joint may be made between the cup and the body of a patient the lower edge of the casing 11 is provided with a rubber gasket.

In Figure 3 I have shown a rubber gasket 19 having a reduced upper portion 20 so that an interior shoulder 21 is formed to abut the lower edge of the casing 11. The gasket 19 is held in position by means of a band 22a encircling it and compelling it to intimate contact with the wall of the casing. The gasket 19 and the band 22a may be secured to the

casing by threaded screws 20, or by other suitable means.

In Figure 4 I have shown a modified form of gasket. This gasket 21 consists of a rubber strap having a bifurcated portion so that a pair of members 22 engage opposite sides of the wall of the casing 11 at its lower end. The members 22 may be secured to the wall of the casing 11 by bolts 23, or by any other suitable means.

Figure 5 shows an alternative shape of my cup for covering relatively large areas of the body of a patient; and it will be evident that the structure I have shown and described may be embodied in cups having casings shaped to cover irregularly shaped parts and areas of the human body without departing from the spirit of my invention. While I have described the disc or closing member 14 as being of glass it will be understood that I do not purpose limiting myself to the use of any particular kind of glass, and that I contemplate the use of other materials which are substantially transparent to the rays used in treating the parts of the human body, and which will preferably be of such a nature to permit the physician to inspect the enclosed parts during treatment.

I claim as my invention:

1. A vacuum cup for use in treating the human body with light rays, said cup comprising an open-ended casing of a material opaque to light rays, a member transparent to light rays positioned on one end of said casing to seal that end against the ingress of air, and an apertured member on the casing and in communication with the interior thereof for connection to an air-aspirating device.

2. A vacuum cup for use in treating the human body with light rays, comprising an open-ended casing of a material opaque to light rays, a member transparent to light positioned on one end of said casing to seal that end against ingress of air, conduit means on the casing for connection with an air-aspirating system, and means including a wall of said casing manually controllable to control admission of air into the casing while the cup is in use in contact with the human body.

3. A vacuum cup for use in treating the human body with light rays, comprising a dished member having a part thereof transparent to light rays, conduit means on the member for connection with an air-aspirator, and a gasket secured to the rim of said member, said gasket having opposed members secured on opposite surfaces of the wall of said dished member and an integral depending resilient member for contact with the human body to provide an air-tight joint between the body and the dished member.

4. A vacuum cup for use in treating the human body with light rays, comprising an open-ended casing of a material opaque to light rays, a member transparent to light po-

sitioned on one end of said casing to seal that  
end against ingress of air, a resilient gasket  
member secured on the other end of the cas-  
ing adapted to form a seal when the casing is  
5 applied to a human body, and conduit means  
on the casing for communication with an air-  
aspirating system.

In testimony whereof I have hereunto sub-  
scribed by name at Chicago, Cook County,  
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