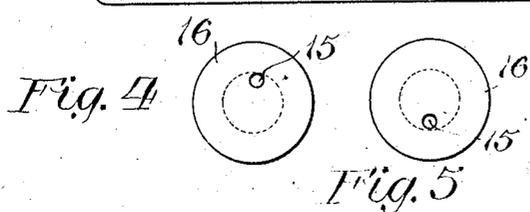
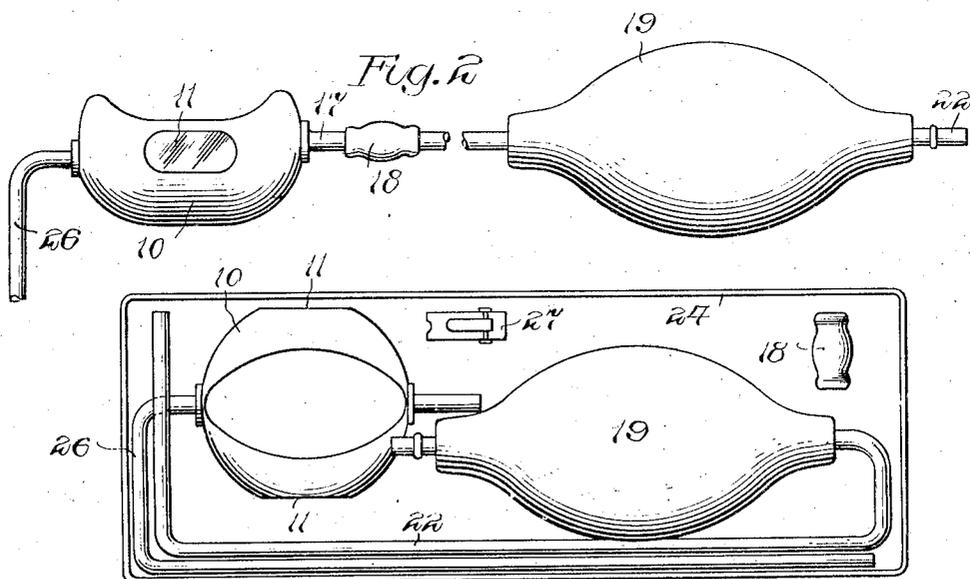
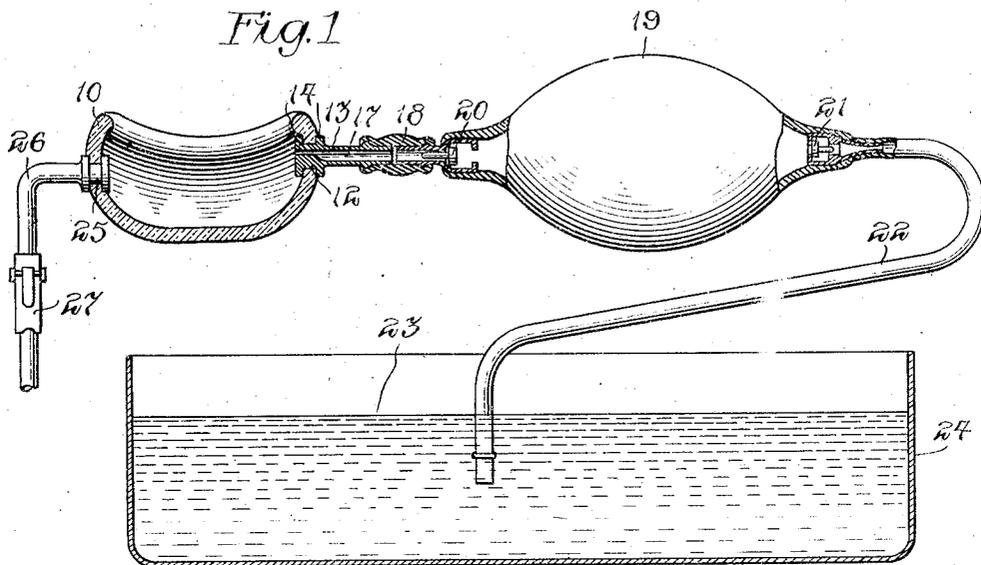


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 APPARATUS FOR EYE TREATMENT.  
 APPLICATION FILED DEC. 14, 1916.

1,362,682.

Patented Dec. 21, 1920.  
 2 SHEETS—SHEET 1.



*Fig. 3*

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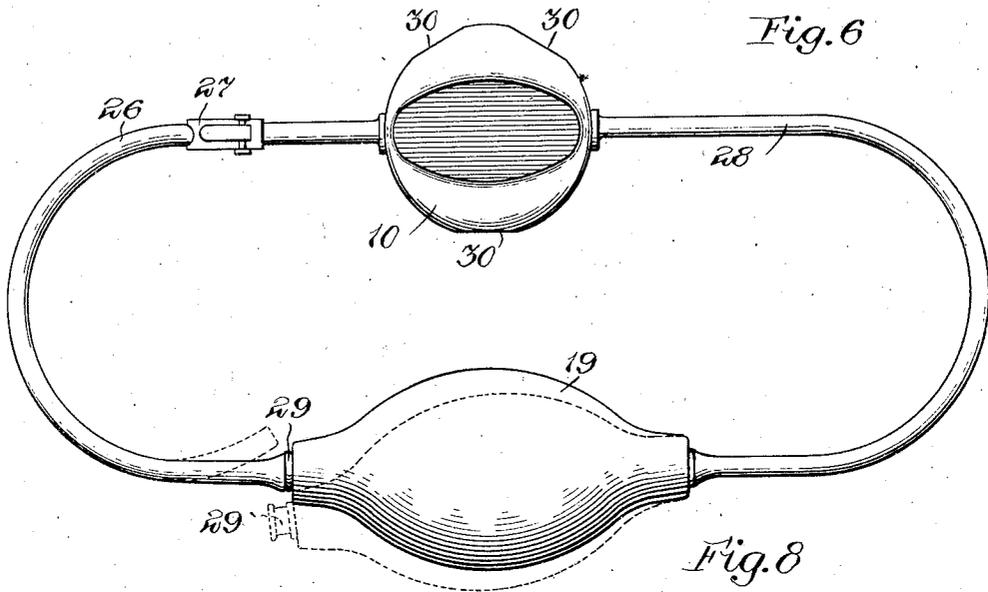


Fig. 6

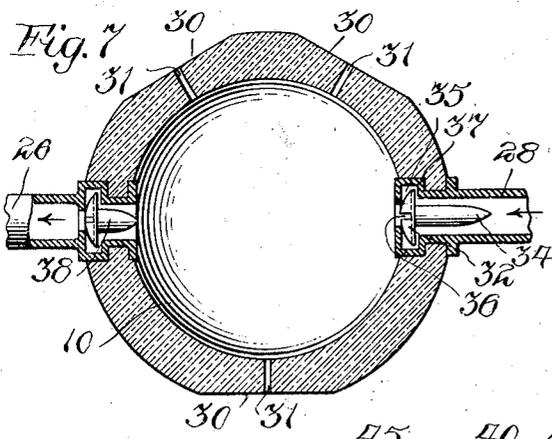


Fig. 7

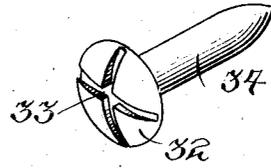
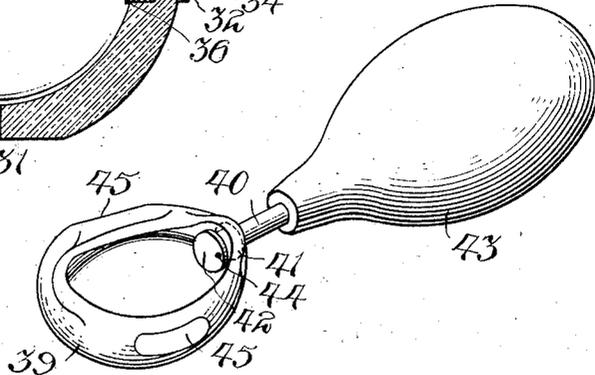


Fig. 9



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# UNITED STATES PATENT OFFICE.

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## APPARATUS FOR EYE TREATMENT.

1,362,682.

Specification of Letters Patent. Patented Dec. 21, 1920.

Application filed December 14, 1916. Serial No. 136,854.

*To all whom it may concern:*

Be it known that I, FRANK E. DAYTON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Apparatus for Eye Treatment, of which the following is a specification.

This invention relates to improvements in apparatus for treating the eye, though not necessarily limited in its use for such purpose, and has for one of its objects the provision of an apparatus of this character by means of which the eye may be completely and thoroughly bathed or irrigated, and also by means of the use of which the eyelids will be readily elevated and manipulated during the bathing or irrigating operation.

A further object is to provide an improved device of this character by means of the use of which the eyelids may be readily and effectively massaged either by air or liquid.

A further object is to provide an improved method and apparatus of this character which may be employed for facial, throat or other massage operations.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear, the invention consists in substantially the method of such treatment and in substantially the construction and arrangement of the apparatus for carrying such method into operation.

In the drawings:

Figure 1 is a view partly in section and partly in elevation of an improved apparatus by means of which this improved method may be carried into operation.

Fig. 2 is a side elevation of some of the parts shown in Fig. 1.

Fig. 3 is a top plan view of the apparatus packed within a receptacle.

Fig. 4 is an enlarged view of a detail.

Fig. 5 is a view similar to Fig. 4 showing the parts in a different position.

Fig. 6 is a top plan view of a different arrangement of the apparatus for producing a continuous circulation of the irrigating fluid.

Fig. 7 is an enlarged horizontal transverse sectional view of the eye cup and the valve for controlling the ingress and egress of the fluid.

Fig. 8 is an enlarged detail perspective view of one of the valves shown in Fig. 7.

Fig. 9 is a perspective view of another form of the apparatus for carrying this method into operation.

In the drawings, the numeral 10 designates generally an eye cup which may be constructed of any suitable material and is preferably provided on its surface with portions 11, which may be flattened or otherwise shaped to form finger holds by which the cup may be held in position. The cup is provided through its wall with an opening 12 in which a tubular member 13 is seated and this member 13 may be constructed of any suitable material such as rubber or the like and is provided with spaced flanges 14 so as to hold the tube against displacement with respect to the cup. The tube is provided with an outlet opening 15 in the end 16 thereof and this opening 15 is arranged eccentrically with respect to the opening 17 of the tube. The tube 13 is adapted to be rotated in the opening 12 which forms a bearing therefor, so that the opening 15 may be positioned to cause the stream of incoming fluid to be directed at will and to suit the individual case.

Connected with the tube 17 preferably by means of a coupling 18 is a bulb 19 having a valve 20 arranged at one end thereof and a valve 21 arranged at the opposite end thereof. These valves 20 and 21 are disposed to operate in opposition to each other, that is to say, when the bulb 19 is compressed to force the fluid from the bulb, into the pipe 17 to flow into the eye cup 10, the valve 20 will be opened and the valve 21 will close the inlet of the supply tube 22, and which latter is adapted to be inserted in the liquid 23 held by the receptacle 24.

When the bulb 19 is released so as to allow the same to expand, thereby creating suction in the bulb, the valve 20 will close the entrance to the pipe 17 and the valve 21 will open the outlet of the pipe 22 to allow the liquid 23 to flow from the receptacle 24 into the bulb 19, to be forced from the bulb past the valve 20 and into the eye cup 10 when the bulb 19 is compressed and which compression will also cause the valve 21 to close the pipe 22. The eye cup 10 is provided with another opening 25 which is preferably arranged opposite the opening 12, but at a different level so that the outlet of the pipe or tube 17 will be out of alinement with the inlet of the pipe or tube 26, and this arrange-

ment of the pipe 26 at a lower level than the inlet will allow perfect drainage from the anterior pole of the eye.

In use the eye cup is placed over the eye and the end of the pipe or tube 22 is inserted in the liquid 23. The bulb 19 is then manipulated and this will cause the fluid from the receptacle 24 to flow through the cup 10 transversely of the eye and in a direction from the outer toward the inner canthus of the eye.

The manipulation of the bulb will also cause the eyelid to be raised and a pulsating action will also be given to the eyelids by the action of the liquid thereon. Should it be desired to impart an ordinary massage operation to the eyelids, all that is necessary is to close the pipe or tube 26, which may be accomplished in any desired or suitable manner, either by bending the tube 26 or applying thereto a conventional form of clasp 27 and then detaching the bulb 19 from the tube 17. The end of the pipe 22 may then be inserted in the coupling 18 which will reverse the position of the valves 20, 21 with respect to the eye cup and then by manipulation of the bulb 19, sufficiently so as not to entirely close the valve 21 when the bulb is compressed, it will be seen that the air will be alternately drawn out of and forced into the cup 10 through the opening 15 and the eyelids will be given a pulsating as well as massage operation. When this apparatus is not in use it may be readily packed within the receptacle 24.

In Fig. 6 there is shown an apparatus by means of which a continuous circulation of the fluid may be obtained through the cup 10 and bulb 19, and is accomplished by attaching a longer tube 28 to the pressure or outlet end of the bulb 19, and which tube 28 corresponds with the short tube 17 in Fig. 1. The outlet tube 26 from the cup 10 is attached to the inlet or suction end of the bulb 19 as at 29. With this form of the invention it is first necessary to fill the cup 10 with fluid, the bulb 19 having been first compressed. After the liquid has been placed in the cup 10, the bulb 19 may be released and this expansion will create a suction through the tube 26 to draw the liquid from the cup 10 so that it will flow into the bulb, a portion of which may remain in the pipe 26. After the cup is placed over the eye, the bulb 19 may then be manipulated by first compressing and then expanding the same and this operation it will be seen will cause the liquid to circulate through the cup and bulb 19.

If it is desired to use the form of apparatus for simply massaging the eyelids, all that is necessary is to detach the end of the tube 26 from the bulb 19 as shown in dotted lines in Fig. 6 and close the outlet tube 26 by means of the clamp 29, after which the bulb 19 may

be manipulated and this will cause a suction in the cup 10 which will pulsate the eyelids.

The cup 10 as shown in Figs. 6 and 7, is provided with a plurality of portions 30 which may be flattened or otherwise shaped to form finger holds by means of which the cup may be held in position against the eye, and passing through these portions 30 are vent tubes 31, which are adapted to be controlled by the fingers of the operator so that in manipulating air can be admitted into the cup at any desired point while the liquid is flowing through the cup, and this is accomplished by opening or closing the vents. In Figs. 7 and 8 there is shown one form of valve for controlling the inlet of the fluid, and this valve is arranged in the end of the tube 28 and is commonly known as a "tack valve," comprising a head 32 having radial grooves 33 extending across the head, and a stem 34. The head 32 is adapted to be seated in a chamber 35 in the end of the tube 38 and which chamber has an outlet opening 36 in the wall thereof. The head abuts the walls 37 of the chamber to prevent the valve from being displaced and the stem 34 of the valve projects into the tube 28, so that when pressure is exerted by the bulb 19, the fluid passing into the pipe 28 will unseat the valve 37 and move it toward the opening 36 and with which opening the grooves 33 in the head of the valve connect, thereby forming a passage for the fluid through the passages 33 and out of the opening 36.

When the bulb 19 is released to permit the same to expand, the valve 37 will be seated by suction, the stem 34 guiding the valve in its movements. This form of valve is particularly effective when the apparatus is used in the manner shown in Fig. 1. Should a circulation creating device be employed with the form of the apparatus shown in Figs. 6 and 7 which is itself not provided with oppositely operating valves, then another valve 38 similar to the valve shown in Fig. 8 may be employed to control the outlet tube 26 but is arranged to work in opposition to the inlet valve.

In securing the tubes to the cup, the flanges 14 are preferably made of flexible material so that the tube may be threaded into the respective openings from inside of the cup and then one of the flanges 14 drawn through the opening so that the flanges will stand on opposite sides of the wall of the cup. In Fig. 9 there is shown an apparatus for massaging the eyelids and in this form of apparatus, the eye cup 39 is provided with only one opening through its wall through which the fluid passes. The tube 40 is seated in the opening and is provided with spaced flanges 41, 42 standing on opposite sides of the wall of the cup and the tube has a bulb 43 connected with its

outer end for creating pulsations of the eyelid. The inner end of the tube which projects into the cup 39 is closed with the exception of a small opening 44 arranged eccentrically in the end of the tube and the finger holds 45 on the exterior surface of the cup permit the latter to be readily held.

When this device is used, the cup is placed over the eye and the bulb 43 manipulated so as to cause a circulation of fluid into and out of the cup through the opening 40.

By rotating the pipe 40 in its bearing in the cup, it will be manifest that the stream of fluid through the opening 44 into the cup will be directed in any predetermined path with respect to the eye and from the outer to the inner canthus.

With this improved method and with the apparatus for carrying the same into effect it will be seen that a complete irrigation or thorough flushing and bathing of the eye may be obtained and at the same time the eyelids will be elevated and manipulated during the flushing operation. Furthermore, the eyelids may be massaged either by air or by the use of a liquid and the direction of the flow of fluid through the cup may be controlled or determined by the operator.

While the preferred forms of apparatus for carrying this improved method into operation have been herein shown and described it is to be understood that many

changes may be made in the apparatus without departing from the spirit of this invention and without impairing the efficiency and the operation of the herein described method.

What is claimed as new is:—

1. An apparatus for treating the eye, embodying an eye cup, said cup being provided with a fluid inlet and a fluid outlet, means for circulating a fluid into the cup through the said inlet and out of the said outlet, said inlet and outlet being arranged out of alignment, and provisions whereby said inlet and outlet may be shifted one with relation to the diametric center of the other and while the parts are connected.

2. An apparatus for treating the eye, embodying an eye cup having a fluid inlet, a pipe having a bearing in said inlet and having an eccentrically arranged outlet, and means for forcing fluid into the cup through the pipe and out of said outlet, said pipe being adapted to be rotated in the said bearing to vary the position of the said eccentric opening to vary the direction of the stream of fluid.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 11th day of December, A. D. 1916.

FRANK E. DAYTON.

Witnesses:

IRMA M. BARING,  
J. H. JOCHUM, Jr.