May 7, 1935. C. G. MILLER 2,000,710

VACUUM THERAPY DEVICE

Filed June 22, 1932

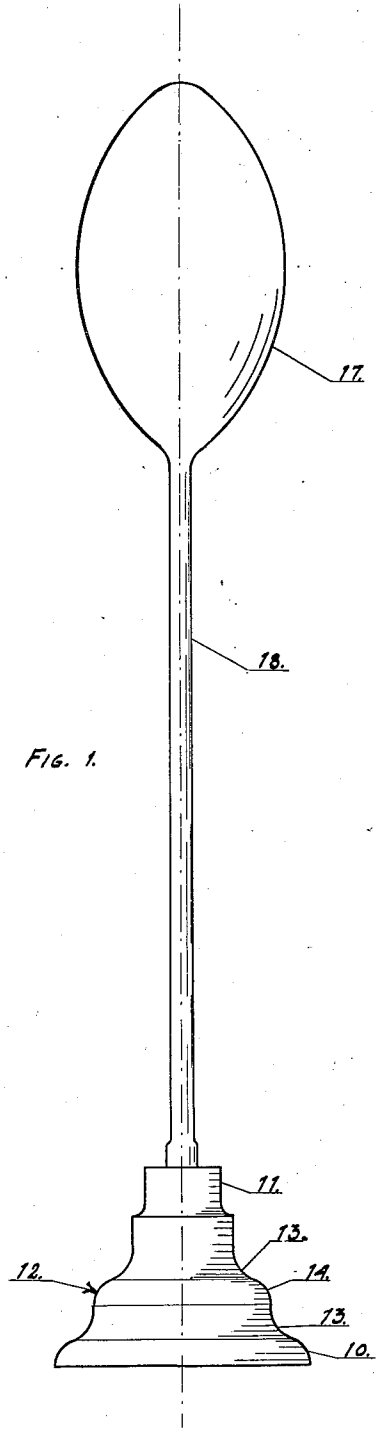

FIG. 1.

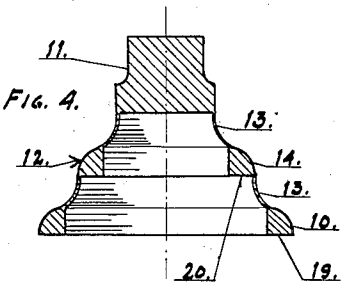

FIG. 4.

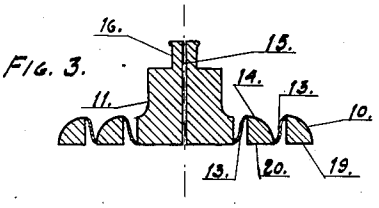

FIG. 3.

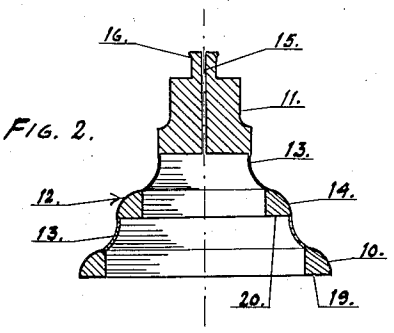

FIG. 2.

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VACUUM THERAPY DEVICE

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3 Claims. (Cl. 128—300)

This invention relates to vacuum therapy devices and to stimulating and massaging implements adapted for the local application of vacua in connection with beauty treatments, reducing treatments and the like.

The vacuum therapy devices which have heretofore been used have employed exhausting devices connected to rigid or semi-rigid cups of metal, glass, porcelain, vulcanized rubber and the like, the cups being of sufficient strength and/or resiliency not to collapse under the applied vacuum. This invention is a radical departure from such devices and represents a distinct improvement thereon.

It is a feature of vacuum therapy devices embodying this invention that they comprise a collapsible element which is in itself wholly unable to withstand an applied vacuum but which may be manipulated to create a vacuum. This collapsible element, for example, may be in the form of a collapsible cup which collapses under applied vacuum but which may be readily manipulated for the creation and maintenance therein of vacua as desired. The simplicity and utility of this feature of this invention as embodied in a collapsible cup, for example, for direct application of vacua to the flesh will be apparent. To illustrate, the cup may be provided with a flesh-contacting ring providing air-tight or semi-air tight contact with the flesh. Intermediate between the flesh-contacting rim and the bottom or base of the cup, the side wall is made collapsible and is in effect a collapsible bellows. While the collapsible side wall cannot withstand applied vacua, nevertheless, by positively moving the base of the cup from collapsed position to extended position while maintaining the flesh-contacting rim in contact with the flesh, a vacuum can thus at once be effectively and readily produced and regulated as desired by the user.

It is a further feature of this invention that the collapsible side wall or bellows of the collapsible cup may be substantially cone-shaped so that the base of the cup may be brought up substantially flush with and within the rim of the cup when the cup is collapsed. It is also a feature of this invention that the side wall bellows may be strengthened by one or more rims of rigid or semi-rigid material and that when the bellows is cone-shaped such intermediate strengthening ring or rings may be intermediate in size between the contacting rim and the base of the cup, so that the whole cup, of bell-shaped form when extended, including the intermediate strengthening ring or rings, may be collapsed upon itself, bringing the contacting rim, intermediate ring or rings and base substantially flush with one other.

In novel collapsible vacuum cups embodying this invention, the bellows portion may comprise alternate web-like flexible portions which are preferably substantially non-resilient. These web-like portions may be alternately connected to strengthening rings. In such construction, the collapsible cup is afforded extreme flexibility and is preferably made so as to collapse under its own weight.

Numerous advantages are afforded in the use of collapsible vacuum cups, for example, embodying this invention. By contacting the cup when in folded position with the flesh and withdrawing the base thereof away from the flesh so as to extend the bellows portion of the cup, a vacuum can be produced and maintained as long as the base is maintained in withdrawn position. While maintaining the base withdrawn, the cup may be moved around with appropriate massaging movements to combine the advantages of massaging with the stimulating effects of a vacuum. Moreover, by easy manipulation, the degree of extension of the bellows and the degree of vacuum may be varied and regulated as desired.

It is thus seen that a cup comprising a collapsible bellows according to this invention affords in itself efficient and convenient means for producing a vacuum. However, such a cup may not only be used by itself in the application of vacua but also may be used in conjunction with a supplementary source of vacuum such as a resilient bulb communicating with the interior of the collapsible cup by suitable opening. In such a device, the vacuum afforded by the bulb may be augmented by manipulation of the bellows of the collapsible cup at the will of the user and the vacuum may be increased or diminished as desired.

It is a further feature and advantage of this invention that, when the cup is collapsed, the flesh-contacting rim, cup base, and any strengthening ring or rings thereof, due to the fact that they lie flush with one another, are all capable of contacting with the flesh, thus affording a plurality of pliable flesh-contacting surfaces and constituting a desirable massaging implement, which can nevertheless be converted into a vacuum-producing device merely by extending the bellows of the cup while maintaining the flesh-contacting rim in contact with the flesh. Moreover, it is an added advantage that the cup, being

collapsible, may be compactly folded when not in use.

Further features and advantages of this intion will be apparent in connection with the following description of this invention which, with the accompanying drawing, illustrating a preferred embodiment thereof, wherein

Figure 1 is a front view of a vacuum therapy device embodying this invention and comprising a collapsible cup in combination with a resilient bulb;

Fig. 2 is a front sectional view of the collapsible cup shown in Fig. 1 with the resilient bulb and tube connection removed, the cup being in extended position;

Fig. 3 is a view similar to that shown in Fig. 2 with the cup shown in collapsed position; and

Fig. 4 is a modification of this invention comprising a collapsible cup with a solid base or handle not adapted for connection with a resilient bulb or other source of vacuum.

In the embodiment of this invention shown in Figs. 1 to 3, a flesh-contacting rim 10 is shown which may be of any suitable rigid or semi-rigid material and is preferably constructed of vulcanized rubber. Between th flesh-contacting rim 10 and the base or bottom 11 of the collapsible cup a side wall is provided which is collapsible and which is preferably in the form of a flexible bellows which is indicated generally by refrence character 12. The collapsible bellows 12 may be constructed in a number of different ways within the scope of this invention. In the embodiment shown in the drawing, the collapsible bellows 12 comprises two web-like flexible sheets 13 which are preferably made of thin, flexible and substantially non-resilient rubber. It is preferable to strengthen the web-like sheets as shown in the drawing by one or more strengthening ring or rings 14, although it is apparent that the portion of the cup comprising base 11, the single web 13 and the ring 14 constitutes an element of the cup which may be used alone or with the addition of further web and ring elements.

The ring or rings 14 may be of the same shape and material as the contact rim 10 or may be of any other similar structure, form or material.

In the embodiment of this invention shown in the drawing, the outside diameter of the strengthening ring 14 is smaller than the inside diameter of the flesh-contacting rim 10. Moreover, the outside diameter of base 11 is smaller than the inside diameter of the strengthening ring 14. With this structure, the cup is afforded complete collapsibility. The appearance of the cup when completely collapsed is shown in Fig. 3, and it is to be noted that the flesh-contacting rim 10, strengthening ring 14 and base 11 have all been brought substantially flush with one another. Where the contact rim, intermediate ring and base are successively smaller, the bellows will be cone-like in form.

In the embodiment of this invention shown in the drawing, the flesh-contacting rim 10 is made with a flat lower flesh-contacting surface 19. The intermediate strengthening ring 14 is also provided with a flat lower surface 20. The cross section of the flesh-contacting rim 10 and ring 14 is in the form of a quarter circle, the curved portion thereof forming part of the exterior of the cup. The flexible web-like sheet 13 is attached to flesh-contacting rim 10 adjacent the upper portion thereof, and is attached to intermediate ring 14 adjacent the lower portion thereof. This method of attaching the web-like sheet or sheets 13 is preferably employed throughout the bellows 12.

In the embodiment of this invention shown in Figs. 1 to 3, an opening 15 is provided in the base 11 of the collapsible cup. In this modification of the invention, the base of the cup is preferably provided with a nipple 16 through which the opening 15 passes and to which a resilient bulb 17 may be attached as by means of rubber tube 18.

In the embodiment of this invention shown in Fig. 4, the structure is substantially the same as that shown in Figs. 1 to 3 except that the base 11 of the collapsible cup is not provided with an opening therethrough, and with this exception the foregoing description relates thereto.

In the modification shown in Fig. 4, as well as in the modification shown in Figs. 1 to 3, the base 11 of the collapsible cup is preferably made of such shape that it may be readily grasped by the user of the device.

The manner of using the above device is apparent. Referring to the modification shown in Fig. 4, the device may be used by applying the cup to the flesh while in collapsed or semi-collapsed position. While maintaining the flesh-contacting rim in contact with the flesh, the withdrawal of the base of the cup will create a vacuum which can be increased or diminished by extending or collapsing the bellows of the cup. This may, of course, be done at the will and to suit the purpose of the user. The cup may be used for massaging in conjunction with the application of vacua by moving the cup about. If desired, the vacuum can be maintained during the massaging movements. It is an advantage of the structure shown in this invention, however, that massaging effects can also be had when the cup is in collapsed position (without vacuum) and it is of advantage that, when the cup is collapsed as shown in Fig. 3, the base, flesh-contacting rim and intermediate strengthening ring or rings all fall flush with one another and present a series of pliable surfaces which are desirable massaging agents. The embodiment shown in Figs. 1 to 3 may be used similarly. In this case, however, the vacuum created by the bellows action of the collapsible cup may be used in conjunction with the vacuum created by the resilient bulb to augment and control the same at the will of the user. Moreover, when the collapsible cup shown in Figs. 1 to 3 is detachably secured to the resilient bulb, the cup may be used similarly to the cup shown in Fig. 4 merely by placing the finger over opening 15 in nipple 16 so that a vacuum may be produced within the cup.

While this invention has been described in connection with specific embodiments thereof, it is apparent that numerous modifications may be made without departing from the scope of this invention. Thus, the particular form of the contacting rim, bottom, intermediate bellows, intermediate ring or rings, etc., of the collapsible cup may be changed considerably. Thus they may not only be round but may assume other shapes or configurations that may be desirable or decorative. In the embodiment of this invention that is illustrated in Figs. 1 to 3, the cup portion of the device may be detachably secured to the resilient bulb. In such case two or more cups of different shapes and which are adapted for application to different parts of the body may be made up and sold with a single resilient bulb and used by successively attaching same to the bulb. The intermediate strengthening rings may be

omitted altogether or may be increased in number. Moreover, the collapsible bellows may be in the form shown or may be of any other folding character substantially impervious to air whereby vacua may be created or diminished by the extension or collapsing of the bellows and may be used in other association than the specific association shown. Moreover, a collapsible cup embodying this invention may be used in conjunction with other additional sources of vacuum than resilient bulbs, e. g., mechanical or liquid pumps and the like.

I claim:—

1. A vacuum therapy device comprising a semi-rigid rubber flesh-contacting rim, a base, and a bellows between said rim and said base, said bellows including alternate substantially continuous sections of thin easily-flexible web-like sheet rubber on either side of a semi-rigid strengthening ring which ring is many times thicker than said sheet rubber, and said cup being bell-like in shape and collapsible upon itself so that said rim, said base and said strengthening ring become flush with one another when said cup is collapsed, the sheet rubber webs being foldable in appropriate folds between said rim, ring, and base.

2. In a vacuum therapy device, a collapsible cup comprising a flesh-contacting rim having a substantially flat bottom surface, an intermediate ring having a substantially flat bottom surface, the external diameter of said intermediate ring being smaller than the internal diameter of said flesh-contacting rim, a substantially non-resilient flexible web-like sheet between the upper part of said flesh-contacting rim and the lower part of said intermediate ring, a base having a flat inner surface and of lesser external diameter than the internal diameter of said intermediate ring, and a substantially non-resilient flexible web-like sheet between said base and said intermediate ring, said rim, said ring and said base being adapted to be telescoped upon each other and said webs being adapted to assume appropriate folds therebetween when said cup is collapsed.

3. A vacuum therapy device comprising in combination in the form of a cup a flesh-contacting rim at the rim of the cup, a base, and a bellows portion including a flesh-contacting ring intermediate said rim and said base, said ring being smaller than said rim and adapted to telescope therewithin so that both said rim and said ring may lie against a common surface when said cup is collapsed and so that in extending said cup from collapsed condition by pulling said base away from said surface a vacuum will be applied first primarily within and at said ring and then within and at said rim and said bellows including easily flexible sheet rubber thinner than said ring and said rim and foldable in appropriate folds between adjacent thicker portions of said cup upon collapsing said cup.

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