My invention relates to massage devices and has for its main object to provide an apparatus which not only massages the skin but also creates a suction thereon which opens and cleans the pores, stimulates the blood circulation, and exercises the muscles. Another object is to provide an apparatus of sanitary and light construction which is easy to manipulate and which requires very little power for its operation. A further object is to provide an apparatus of simple construction, consisting of few parts, and comparatively inexpensive to manufacture.

These and other objects and advantages will be readily understood from the following description and from the accompanying drawing of a preferred embodiment, but it will be noted that certain modifications may be made without departing from the scope of the invention. In the drawing:

Fig. 1 is a side elevation of the apparatus;
Fig. 2 another side elevation, taken on line 2-2, Fig. 3, and showing certain parts in section;

Fig. 3 a cross-sectional view, taken on line 3-3, Fig. 2;
Fig. 4 another cross-sectional view, taken on line 4-4, Fig. 2; and
Fig. 5 a plan view of certain parts of the apparatus.

Referring to all the views simultaneously, the apparatus consists of two semi-circular, side casings 10 and 11 and a collar 12 which is threaded on the front ends of the casings. The casings are shown riveted together by two pins 13, but may be assembled in any other suitable manner. The casings form a cylindrical chamber 14 and a hollow handle member 15.

The casing 10 is provided with bosses 16, 17, and 18, while both the casings are provided with guide strips 19 and 20. A worm 21 is secured on a shaft 22 which rotates in bearings 23 and 24 drilled in the bosses 17 and 18. The worm shaft is connected, by means of a short rod 25, to a flexible shaft 26 to which motion is imparted from any suitable source, such as an electric motor, for example.

The worm drives a worm gear 27 the shaft 28 of which rotates in a bearing in the boss 16. The direction of rotation of the worm and worm gear is such that the side thrust of the worm gear is against the boss. A crank pin 29 is secured eccentrically on the face of the worm gear and engages in a slot 30 formed in the cross slide 31. The cross slide, which is guided in the two grooves formed by the guide strips 19 and 20, has a forwardly extending arm 32 which terminates in a round threaded stud 33. A washer 34, a flexible diaphragm 35, another washer 36 and a flexible valve disc 37 are all clamped on this stud between a small washer 38 and a nut 39. The washers 34 and 36, as well as the diaphragm, are all perforated with a plurality of air holes 40, as plainly shown on Fig. 5.

The diaphragm is clamped against the front edges of the side casings by a flange 41 which is formed on the cap 42 and held in place by the collar 12. The front of the cap terminates in a nozzle 43 on which a suction cup 44 is detachably mounted.

The operation of the apparatus will now be described: When the worm gear is turned the pin 39 reciprocates the cross slide 31 and consequently moves the diaphragm back and forth between the two extreme positions shown in Figs. 1 and 2. When the suction cup is used for massaging the skin a partial vacuum is formed as the diaphragm moves to its rearward position. The suction thus applied to the skin opens the pores and cleans them of foreign matters at the same time stimulating the blood circulation and giving a certain amount of exercise to the smaller muscles, particularly when applied over the muscles of the face.

By using large washers, such as 34 and 36, a much larger amount of air is displaced than if the diaphragm were to assume the conical shape it would take were small washers used. To further increase the suction the large washers and the diaphragm are perforated and the perforations covered with the flexible flap valve 37. As the diaphragm moves forward the valve assumes the position shown at 45, in Fig. 1, and allows the air to pass through the holes 40. On the rearward movement the valve disc closes the holes.
The suction cup 44 is preferably made with an outer metal shell 46 to reinforce the relatively soft rubber lip 47, which is of the shape shown.

Having described my invention and its operation, what I claim as new and wish to protect by Letters Patent is:

1. In a device of the class described, a body member consisting of a housing and an operating handle, a shaft passing axially through said handle and rotatingly mounted therein, a diaphragm secured in said housing transversely thereof, a worm secured on the end of the shaft, a worm gear mounted in the housing and engaging with said worm, a connecting rod secured to said diaphragm and actuated by a stud on the worm gear, and a cap provided with a suction cup massage applicator closing the open end of the housing.

2. In a device of the class described, a body member consisting of a housing and a handle, a shaft passing axially through said handle and rotatingly mounted therein, a diaphragm secured transversely in the housing, a worm secured on the end of the shaft, a worm gear mounted in the housing and engaging with said worm, a slotted T-shaped connecting rod secured to the diaphragm and guided by slides formed in the housing, a stud secured on the worm gear and engaging in the slot of said connecting rod, a cap placed over the open end of the housing, and a suction cup massage applicator removably attached on said cap.

3. In a device of the class described, a body member provided with an operating handle, said body member and handle formed of two substantially similar halves, a flexible shaft rotatingly mounted in the handle member, one member of a pair of speed-reducing gears secured on the end of the flexible shaft, the other gear member rotatingly mounted in the body member, a cap placed on the open end of the body member for clamping it together, a cupped diaphragm placed over the end of the body member and held by the said cap, means for connecting the diaphragm with the gear member mounted in the body member and for reciprocating it when said member is rotated, means for causing the diaphragm to assume a cupped shape at each end of its reciprocation, and a suction cup massage applicator secured on the cap.

WILLIAM A. ROEHM.

4. In a device of the class described, a body member provided with an operating handle, said body member and handle formed of two substantially similar halves, a flexible shaft rotatingly mounted in the handle member, one member of a pair of speed-reducing gears secured on the end of the flexible shaft, the other gear member rotatingly mounted in the body member, a cap placed on the open end of the body member for clamping it together, a diaphragm placed over the end of the body member and held by the said cap, means for