July 20, 1937. B. W. WHITEHURST 2,087,491

PULSATOR

Filed June 19, 1936

Fig. 1.

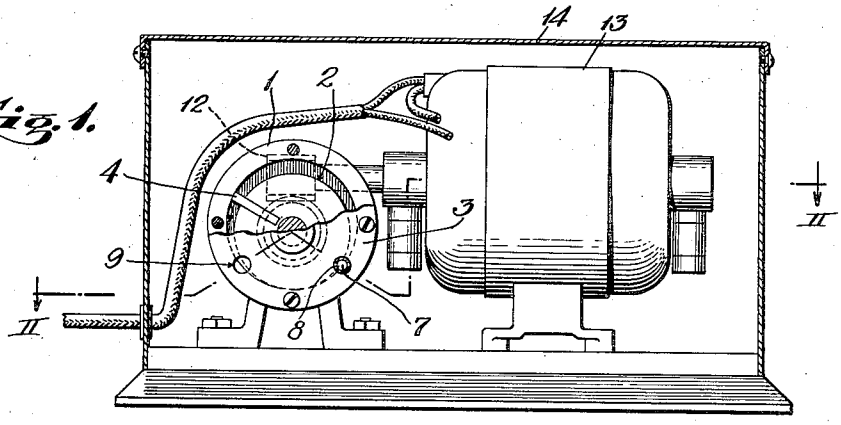


Fig. 2.

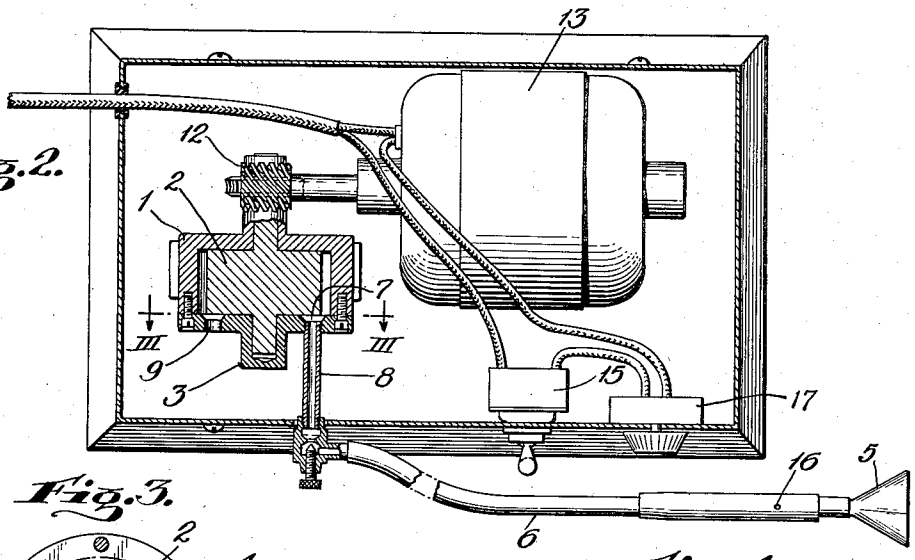


Fig. 3.

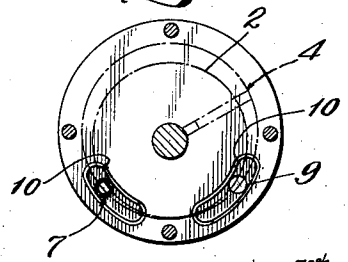


Fig. 4.

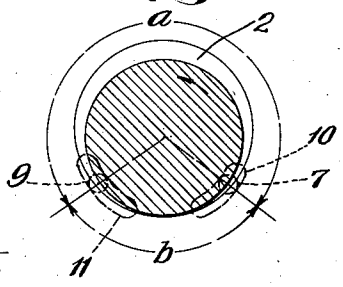
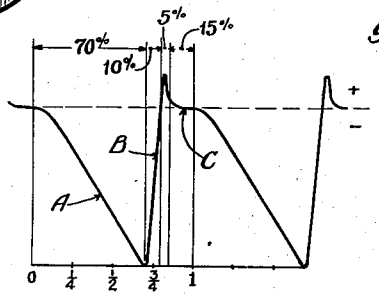


Fig. 5.



INVENTOR

Bert W. Whitehurst

BY

Jeffrey, Kimball & Eggleston

ATTORNEYS

Patented July 20, 1937 2,087,491

UNITED STATES PATENT OFFICE

2,087,491

PULSATOR

Bert W. Whitehurst, New London, Conn., assignor to Whitehurst Chemical Research Corporation, New York, N. Y., a corporation of New York

Application June 19, 1936, Serial No. 86,074

4 Claims. (Cl. 128—297)

The invention is a machine for pneumatic treatment of the skin or surface tissues of the body. Its purpose is to provide an efficient low cost machine for this purpose, operating to impart pulsations to the skin of a highly effective wave-form, without the use of valve mechanism, and hence quietly and with a practically complete elimination of the need for adjustment or servicing.

In the preferred form of the invention illustrated in the drawing,

Fig. 1 is a side elevation with parts broken out;

Fig. 2 a horizontal section on line II—II of Fig. 1;

Fig. 3 a section on lines III—III of Fig. 2;

Figs. 4 and 5 diagrams.

The new machine consists of a cylindrically chambered casing 1 and a rotor 2 eccentrically journaled therein and in a head cover 3. The ends of the rotor have a sealing fit with the chamber but its cylindrical surface has no contact with the cylindrical surface of the chamber and air can flow between these surfaces at the point where they are most proximate. The rotor carries one radially extensible vane 4 which fits the chamber and is the sole means for producing movement of the air, or pressure change, in the system and thereby this single vane determines the wave-form referred to as presently described.

The applicator is a small glass cup 5, or the like, of any suitable conformation and is connected by a flexible tube 6 to a regulator 7 screwed to the end of a nipple 8 tapped into the head of the pulsator chamber on one side of the rotor. The regulator varies the intensity of the action according as the thumb screw thereof is screwed in or out as will presently appear. The tube is preferably of soft, elastic rubber, not longer than four or five feet.

A breather hole 9 is formed in the head cover of the chamber on the opposite side from the applicator nipple 8, and is somewhat larger than the passage through the nipple. Both these holes through the head cover are enlarged as recesses 10 and 11 on their chamber ends to avoid clogging from oil accumulations and provide a free air flow.

In operation, and with the vane rotating in the direction of the arrow of Fig. 4 and with the applicator cup applied to the skin, the effect is as follows:

During the passage of the vane through the arc *a* in Fig. 4, a negative pressure is produced behind it and in the applicator, producing a suction effect in the latter represented by the section A of the wave-form graphically shown in Fig. 5.

On the passage of the vane into the arc *b* the suction effect in the chamber and in the applicator is abruptly relieved through the breather 9, resulting in a back surge into the applicator, represented by section B of the wave-form graph of Fig. 5, and which will be seen from that graph to carry over into the pressure or positive side. This is due to the inertia of the air and the motion of the vane through the arc *b* which creates a pressure condition communicated under the rotor to the applicator tube, and which in practice is followed by a brief neutral interval or dwell in the cycle represented by C and wherein normal or atmospheric pressure obtains in the applicator, thus completing the cycle. It may be noted that the wave-form is in part determined by the arcuate separation of the two holes (8 and 9) in the chamber wall and that the applicator cup is continuously in free communication through its hole 8 with the whole interior of the pulsator chamber.

It is found that operation of the rotor at between 800 and 1600 cycles per minute produces an effect on the skin which is highly efficacious in relieving the pores of sebaceous substance and dirt, but without a pronounced sucking effect heretofore characteristic of this class of apparatus, there being little tendency for the skin to cling to the applicator cup and no sensation of drastic treatment. The cup can be moved freely back and forth over the skin quite the same as if no suction were present, thus making its use readily acceptable to perons otherwise hesitant to submit to a mechanical treatment. Due to the shortness and the low amplitude of the positive impulses, preferably about 5% of the cycle and not over 20%, the outflux of substances from the skin occurs quite as effectively as if the suction were continuous or so strong as to be objectionable.

The pulsator can be driven in any suitable way as by means of a worm and gear drive 12 from a small electric motor 13 of proper speed, the whole being mounted on a suitable base and within a suitable enclosure 14 carrying the motor switch 15 and with the applicator nipple 8 extending through a hole in its side wall to which the regulator 7 and the tube 6 are connected. Preferably the applicator cup is connected to the rubber tube by a hard rubber sleeve in which a small vent hole 16 is formed. By placing the finger over this hole a somewhat stronger action is produced when desired.

As a matter of convenience in establishing preferred frequencies, a rheostat 17 may be included in the motor circuit.

I claim:

1. A skin-treating device, comprising the combination of a pulsator chamber, an eccentric rotor and impeller vane therein, an applicator tube and cup having a point of connection through the chamber wall on one side of said rotor and being continuously in free communication with the whole interior of said chamber and a breather hole in the chamber wall arcuately spaced from the point of communication with said cup on the other side of said rotor.

2. A skin-treating device comprising the combination of a cylindrically chambered casing, a rotor eccentrically journalled therein and carrying an impeller vane fitting the chamber, two arcuately spaced holes in the chamber wall continuously in communication with each other through the chamber, an applicator tube and cup connected to one of said holes and means for driving the rotor to produce alternating positive and negative pressure impulses in the applicator.

3. A skin-treating machine comprising a substantially cylindrical chamber, an eccentric rotor therein carrying a vane, said vane being the only vane carried by the rotor and having continuous sealing contact with the cylinder wall, there being provisions for the passage of air from one side of said vane to the other in any position of the rotor, an applicator tube and cup connected to the interior of said chamber on one side of the rotor's point of closest proximity to the cylinder, a breather hole formed in the chamber wall on the other side of said point and means for rotating the rotor to cause alternate positive and negative pressure impulses in said cup.

4. A skin-treating machine comprising a cylindrical chamber, an eccentric rotor therein carrying a vane, said rotor being separate from the cylinder wall at its point of closest proximity so as to afford an air flow passage from one side to the other thereof and said vane being the only vane carried by the rotor and adapted to contact with the cylinder wall, in combination with an applicator tube and cup connected to the cylinder on one side of said point of closest proximity and a breather hole located on the other side, and means for rotating said rotor and its single vane to produce alternate negative and positive pressure impulses in the tube and cup.

BERT W. WHITEHURST.