

[54] **METHOD AND APPARATUS FOR BEAUTY AND THERAPEUTIC TREATMENT**

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[58] Field of Search ..... 128/65, 66, 230, 173 H, 128/62 A

[56] **References Cited**

**UNITED STATES PATENTS**

1,995,424 3/1935 Guinness..... 128/62 A  
2,695,611 11/1954 Letac..... 128/173 H

3,227,158 1/1966 Mattingly..... 128/62 A  
3,574,239 4/1971 Sollerud..... 128/66

**FOREIGN PATENTS OR APPLICATIONS**

558,180 9/1932 Germany ..... 128/66

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[57]

**ABSTRACT**

A method and apparatus for beauty and therapeutic treatment of skin or mucous membrane in which suitably selected medical liquid is supplied from a tank and spouted from a nozzle onto the surface of the skin or mucous membrane to be treated. The nozzle is provided with a cover made of a resilient material to adaptably fit on the skin surface and the cover has a waste liquid collector. The medical liquid is spouted from the nozzle under pressure, preferably intermittently, thereby permeating into a significant inner portion of the skin to promote clinical effects of the treatment.

**5 Claims, 2 Drawing Figures**

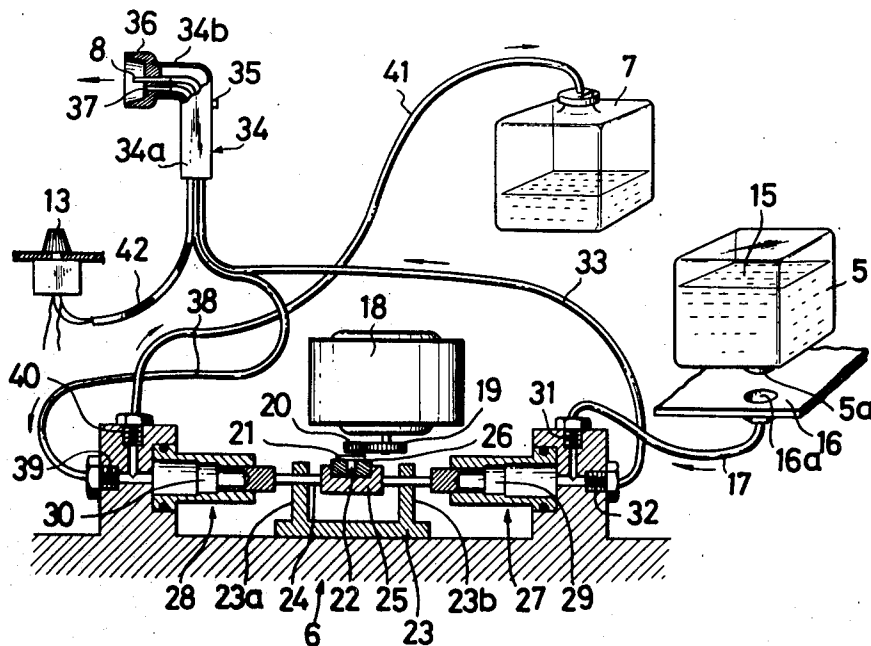


Fig. 1

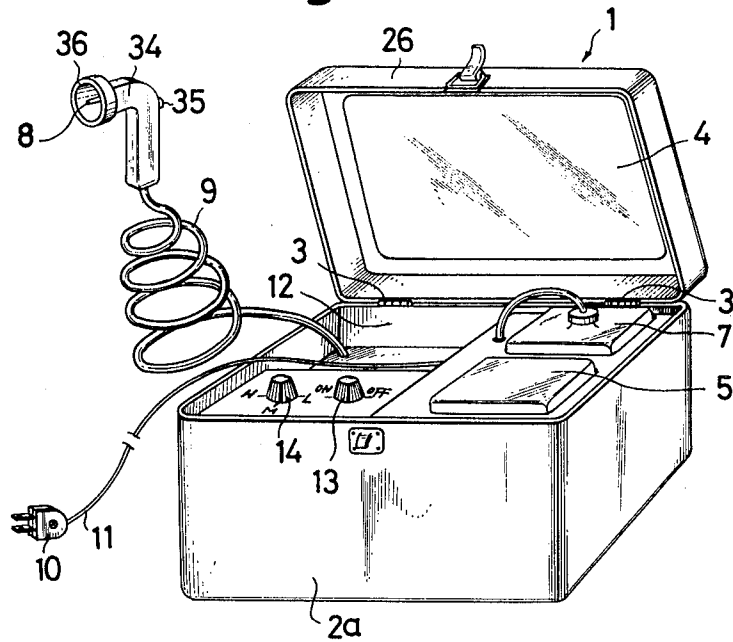
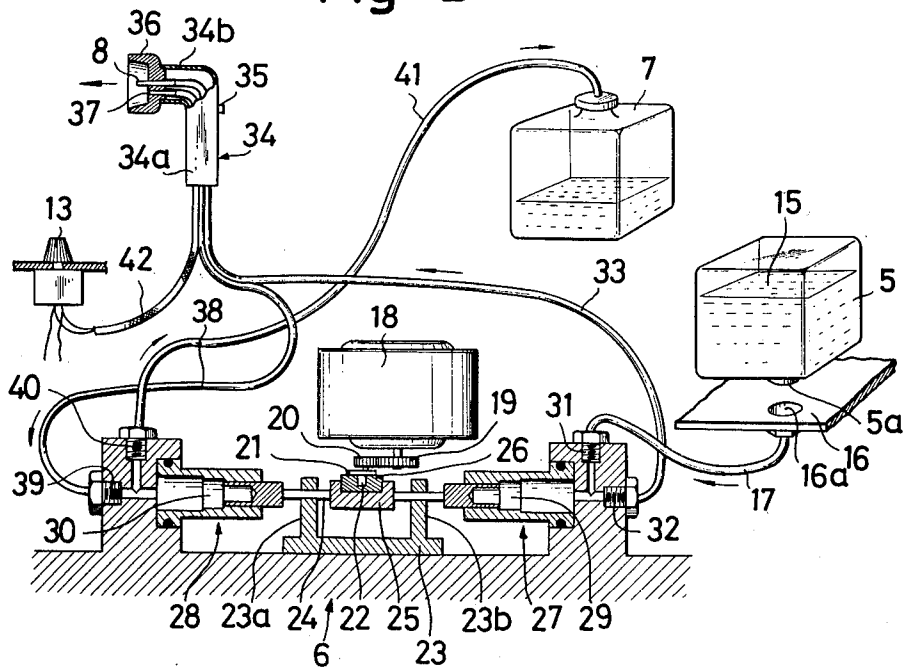


Fig. 2



## METHOD AND APPARATUS FOR BEAUTY AND THERAPEUTIC TREATMENT

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

This invention relates to a beauty and therapeutic apparatus for the beauty and therapeutic treatment of skin and mucous membrane, such as to take out spots or freckles, to remove leucoderma, to heal keloid, to suppress inflammation, to remedy water-exzema, etc.

#### 2. Description of the Prior Art

Conventional beauty and therapeutic treatment of skin and mucous membrane such as for removing spots or freckles includes treatment by absorption through the skin, treatment by internal use or treatment by injection inside the skin. The treatment by absorption through the skin is a treatment which consists in applying a medical liquid or ointment to the surface of the affected part of the skin or the mucous membrane in expectation that the medicine will diffuse over the surface of the skin or mucous membrane and reach the true skin or the proper stratum of the mucous membrane. Regarding this method, however, only clinical empirical efficacy has been recognized and, in view of the osmosis of the medicine, there has not been very much to be expected in practice. The treatment by internal use is a treatment which consists in giving a medicine by mouth so that it may be carried in blood to the true skin or the proper stratum of the mucous membrane. This method, however, is defective in that such medicine as vitamin C or oxidase or reductase may be decomposed in the digestive organs. The injection inside the skin has the defects that the injected medical liquid will find itself locally in a part of the dermal tissue and cannot be expected to spread uniformly with a high concentration throughout the region desired and, in fact, if it is to be tried to make the medicine spread all over, considerable frequency and skill is required, which may involve a destruction of the tissue and some pain to the patient.

### SUMMARY OF THE INVENTION

In view of the above mentioned facts, it is the object of the invention to provide a new and so far unknown method for beauty and therapeutic treatment which enables a beauty and therapeutic treatment of skin and mucous membrane in a manner to ensure a reliable efficacy of the medicine.

It is another object of this invention to provide an apparatus for beauty and therapeutic treatment which is designed to realize the method in a most efficient manner. The beauty and therapeutic apparatus in accordance with the invention comprises a liquid tank for storing a medical liquid containing medicine having an authorized efficacy from beauty and therapeutic point of view, a medical liquid driving means for driving the medical liquid stored in said liquid tank, and a nozzle to spurt or eject the medical liquid driven by said driving means onto the surface of the skin or mucous membrane, whereby the medical liquid driven by said driving means and spouting or ejecting from said nozzle may permeate at least into the true skin or proper stratum of the mucous membrane.

The method and apparatus of this invention can be used for such beauty and therapeutic treatment of skin or mucous membrane as removing spots or freckle, re-

moving leucoderma, healing keloid, nourishing the root of hair, suppressing inflammation, remedying water-eczema, etc. It may also be used as a subsidiary means to such treatment as local anesthesia of the skin surface in a venous injection. As another use of it, the apparatus of the invention may be used to attain such effective application of medicine to the mucous membrane as may not be expected of a mere spraying. Accordingly, it may use medical liquid which contains medicine having efficacy for beauty and therapeutic purposes, for example, a medicine capable of decomposing the melanin pigment such as vitamin C, oxidase, reductase, or glutathione, an adrenal cortical hormone such as steroid hormone, an antibiotic substance, an anti-inflammatory substance, an anticancer substance, etc. The medical liquid is driven by a driving means and spouted from a nozzle onto the skin or mucous membrane, with the nozzle spaced at a distance from the surface of the latter, or the liquid is ejected from a nozzle positioned in contact with the surface of the skin or mucous membrane, thereby promoting efficacy in beauty or therapeutic treatment.

### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective exterior view of a beauty and therapeutic apparatus in accordance with the invention.

FIG. 2 is an illustrative view showing the internal mechanism of the same.

### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

An understanding of the method and apparatus of this invention will be best gained by reference to FIGS. 1 and 2 in which a preferred form of this invention is illustrated.

Referring to FIG. 1, the reference numeral 1 generally denotes the beauty and therapeutic apparatus in accordance with the invention. This apparatus is box-shaped and comprises a case body 2a and a cover 2b. The cover 2b is attached on its one side to the case body 2a by means of hinges 3. A mirror 4 is fitted to the inside of the cover 2b. In the case body 2a, there are accommodated a liquid tank 5, a medical liquid driving means 6 and a waste liquid tank 7, and there is also a space 12 in which a nozzle 8, a flexible tube 9, a plug 10 and a cord 11 may be admitted. The reference numeral 13 shows a main switch and 14 shows a spouting pressure.

Now referring to FIG. 2 together with FIG. 1, in the liquid tank 5 is stored a medical liquid 15 such as mentioned before having an authorized efficacy from the viewpoint of beauty and therapeutic treatment. This tank 5 is housed in the tank receiving space in the case body 2a and is placed on a partition plate 16 positioned in the middle of the case body 2a. The partition plate 16 is formed with a hole 16a into which is to be fitted the supply opening 5a of the liquid tank 5. When the liquid tank 5 is placed on the partition plate 16 with its supply opening 5a fitted in the hole 16a, the liquid 15 will be discharged through the supply opening 5a in a manner well known to the art. The hole 16a and the medical liquid driving means 6 are connected by a supply tube 17.

The medical liquid driving means includes a motor 18 driving a gear 19 which rotates a gear 20 engaged therewith and hence rotates a disc 21 secured to the

same shaft as the gear 20. The disc 21 has fixed thereto a pin 22 extending at right angles to the surface of the disc 21 and positioned offset from the axis of rotation. The pin 22 is engaged, through the intermediary of an anti-abrasive member 26, with an enlarged-diameter middle part 25 of a reciprocal rod 24 supported by a support member 23 having a pair of bearing posts 23a and 23b. Thus the rotation of motor 18 will make a reciprocating motion of the reciprocal rod 24. The reference numeral 27 shows a liquid supply pump and 28 is a waste liquid pump. The medical liquid driving means 6 serves also as a waste liquid discharge means. The supply liquid pump 27 and the waste liquid pump 28 are reciprocal pumps, respectively, and their respective pistons 29 and 30 are secured to the opposite ends of the reciprocating rod 24. Thus, rotation of the motor 18 will cause the medical liquid 15 from the tank 5 to go into the inlet 31 of the supply pump 27 and come out of the outlet 32. A supply tube 33 is connected to the outlet 32. The ejected medical liquid flows through the supply tube 33 and spurts or ejects from the nozzle 8 provided with a grip 34. The grip 34 is bent at right angles in the middle and is provided with a remote switch 35 on the main body side 34a and with a cover 36 on the end of the bent portion 34b. This cover 36 is made of a material which can rapidly adapt itself to the surface of the skin or mucous membrane. In the cover 36 is fitted the above mentioned nozzle 8 in a detachable manner. A waste liquid hole 37 is also provided in said cover 36. The waste liquid hole 37 is a hole to discharge the medical liquid spurting or ejecting from the nozzle 8.

A waste liquid tube 38 is connected at its one end to the waste liquid hole 37. The other end of the waste liquid tube 38 is connected to the inlet 39 of the waste liquid pump mentioned above. The medical liquid in the cover 36 is drawn by the suction of the waste liquid pump 28, entering the inlet 39 and exiting from the outlet 40 of the waste liquid pump 28 and then forced into the waste liquid tank 7 through the waste liquid tube 41. The waste liquid tank 7 is disposed in the case body 2a adjacent to the liquid tank 5. If permitted, the liquid in the waste liquid tank 7 may be returned again to the liquid tank 5 for reuse.

Preferably, the nozzle 8 is replaceably mounted so that a suitable nozzle may be used selectively depending on the size or condition of the affected part of the skin or mucous membrane onto which the medical liquid 15 is to be spurted or ejected. Also, preferably, the supply liquid tube 33, waste liquid tube 38 and the cord 42 connecting between the remote switch 35 and the medical liquid driving means 6 are all passed through a common flexible tube 9.

The plug 10 is to feed the motor 18 with energy.

In the embodiment mentioned above, use has been made of a motor. However, an electromagnetic vibrator may be used in place of the motor. Instead of the piston shown, a diaphragm may be used which drives the medical liquid by the reciprocation of the diaphragm. Alternatively, a bellows may be used which expands and contracts to drive the medical liquid.

The beauty and therapeutic apparatus 1 has the above mentioned construction. When the main switch 13 is turned to ON, and when the remote switch 35 is turned to ON with the cover 36 placed against the affected part of the skin or mucous membrane, the medical liquid driving means 6 will operate causing the re-

ciprocal rod 24 to move to and fro, so that the medical liquid 15 from the liquid tank 5 will be supplied through the supply tubes 17 and 33 and spouted or ejected out of the nozzle 8. The medical liquid thus spouted or ejected can permeate from the surface of the skin or mucous membrane into the true skin or the proper stratum of the mucous membrane. The excess of the medical liquid is drawn out from the waste liquid hole 37 by the suction of the waste liquid pump 28 and passes through the waste liquid tubes 38 and 41 into the waste liquid tank 7, where it is stored. Thus, the medical liquid from the tank 5 travels as shown by the arrows in FIG. 2, some part thereof being absorbed into the human body and the remainder being returned to the waste liquid tank 7 in the case body 22.

Though not shown in detail, a knob 14 is provided to control the spurting pressure so that the pressure to drive the medical liquid may be chosen depending on patients, the molecular weight of the medicine to be used or the thickness of the affected part of the skin into which the medical liquid is to permeate, in order that the medical liquid will reach at least the true skin or the proper stratum of the mucous membrane to achieve a most effective performance.

The intermittent driving of the medical liquid by means of the supply pump 27 is useful to give a massage effect to the skin, to promote the pressure effect, and to enhance the cleaning effect. The spurting pulse frequency is normally 800 - 3,000 cpm, the most suitable being about 1,800 cpm. In the case of skin, a spurting pressure of 3 - 6 kg/cm<sup>2</sup> applied for 3 - 15 minutes is suitable for beauty purposes, and 6 - 10 kg/cm<sup>2</sup> for 5 - 20 seconds is suitable for therapeutic purposes, although this depends on the location or kind of the trouble to be treated. In the case of mucous membrane, a spurting pressure of 4 - 10 kg/cm<sup>2</sup> lasting for 5 seconds is suitable.

Although in the embodiment shown in the drawing, the liquid tank 5 and the medical liquid driving means 6 have been contained in one casing, they may be formed separately and connected to each other by means of tubes.

As described above, the method and apparatus of this invention make it possible to force a medical liquid easily into the affected portion as much as may be desired without causing any pain or destruction of the tissue of the skin, and to distribute evenly to the tissue of certain scope by means of control of liquid concentration and spurting pressure etc. Furthermore, its efficacy is very great since the medical liquid is directly inserted into the affected part never causing such secondary effects as may be seen in the case of the whole-body application. Physical cut-away or chemical removal of spots or freckles may both hurt the true skin. Grafting in orthopedic surgery may leave keloid around the affected part. According to this invention, however, spots, freckles, etc. may be removed and leucoderma may be vanished without destroying the skin tissue or mucous membrane tissue or leaving keloid. Therefore, the invention is useful for beauty and therapeutic treatment of skin and for therapeutic treatment of mucous membrane.

I claim:

1. A method for beauty and therapeutic treatment of a predetermined area of skin characterized by (a) spraying a liquid on said skin from a nozzle at a pressure of 3-10 kg/cm<sup>2</sup> and with a pulse frequency in the

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range of 800-3000 cpm; (b) maintaining said pressure and pulse frequency on said predetermined area of said skin by providing said nozzle with a cover; (c) pressing said cover against said skin so as to maintain a predetermined distance from said nozzle to said skin; and (d) maintaining said pressure and pulse frequency of said liquid on said skin until said liquid has permeated into said skin a predetermined distance.

2. The method of claim 1 wherein said liquid, after it has contacted said skin, remains in said cover and is continuously removed by suction means.

3. The method of claim 1 wherein said treatment is applied to said skin for 3-15 minutes at a pressure of 3-6 kg/cm<sup>2</sup>.

4. An apparatus for beauty and therapeutic treatment of skin comprising a liquid tank for storing a liquid, a nozzle to spout said liquid onto the surface of said skin, said liquid being pumped from said tank through said

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nozzle at a pressure of 3-10 kg/cm<sup>2</sup> and a pulse frequency of 800-3000 cpm, a pumping means coupled to said nozzle and to said tank, said pumping means for pumping said liquid to said nozzle, a nozzle cover made of a resilient material disposed about said nozzle, said cover arranged and configured on said nozzle such that said nozzle may be held away from said skin at a predetermined distance, means for removing liquid from said cover, said means for removing liquid coupled to said pumping means, whereby said liquid spouted from said nozzle permeates into said skin a predetermined distance.

5. The apparatus of claim 4 wherein said nozzle and nozzle cover are disposed in a grip means for holding and applying said liquid to said skin, said grip means having a means to turn said apparatus on and off.

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