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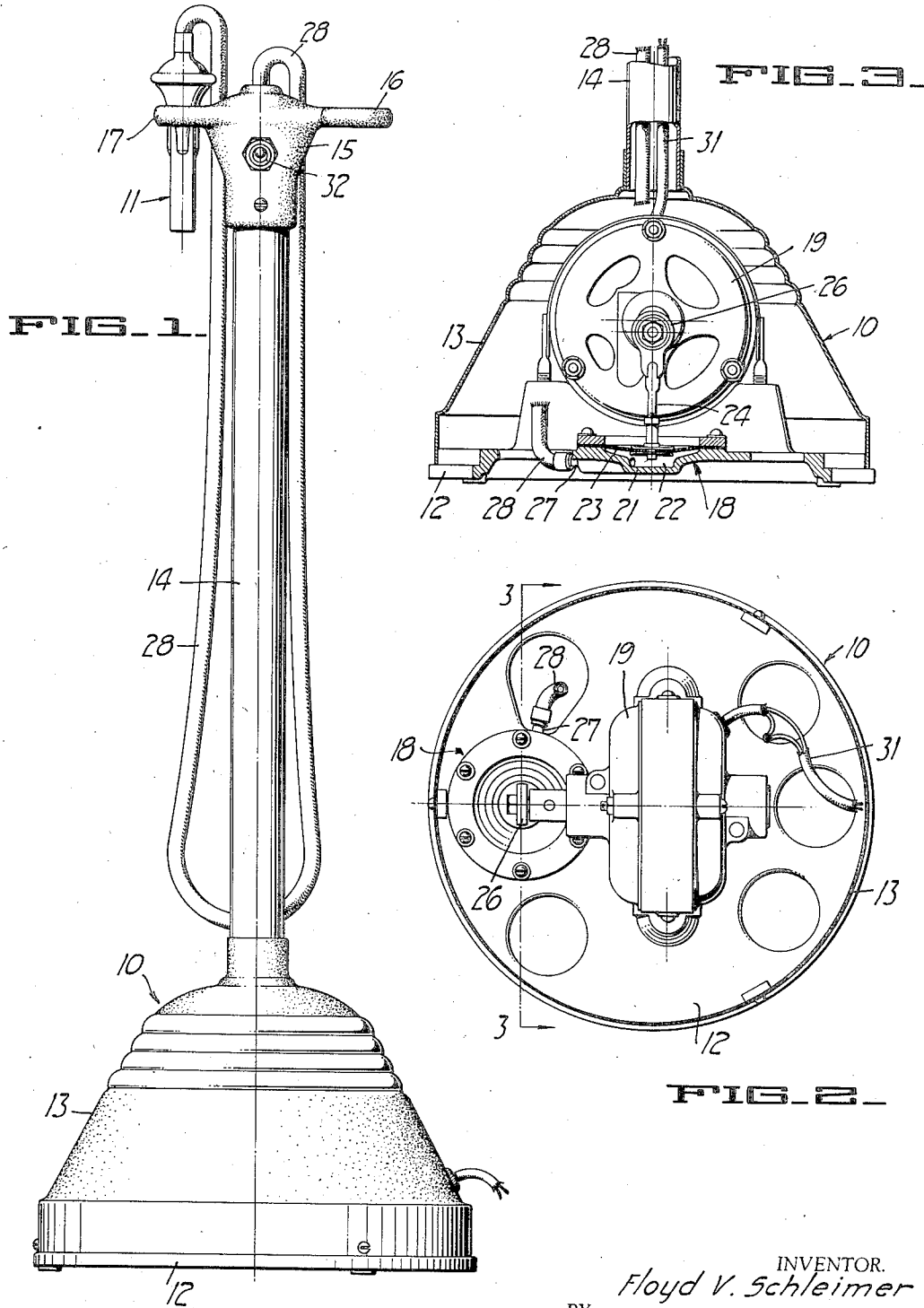
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POWER OPERATED MACHINE FOR MANICURING AND LIKE OPERATIONS

Filed Nov. 4, 1935

2 Sheets-Sheet 1



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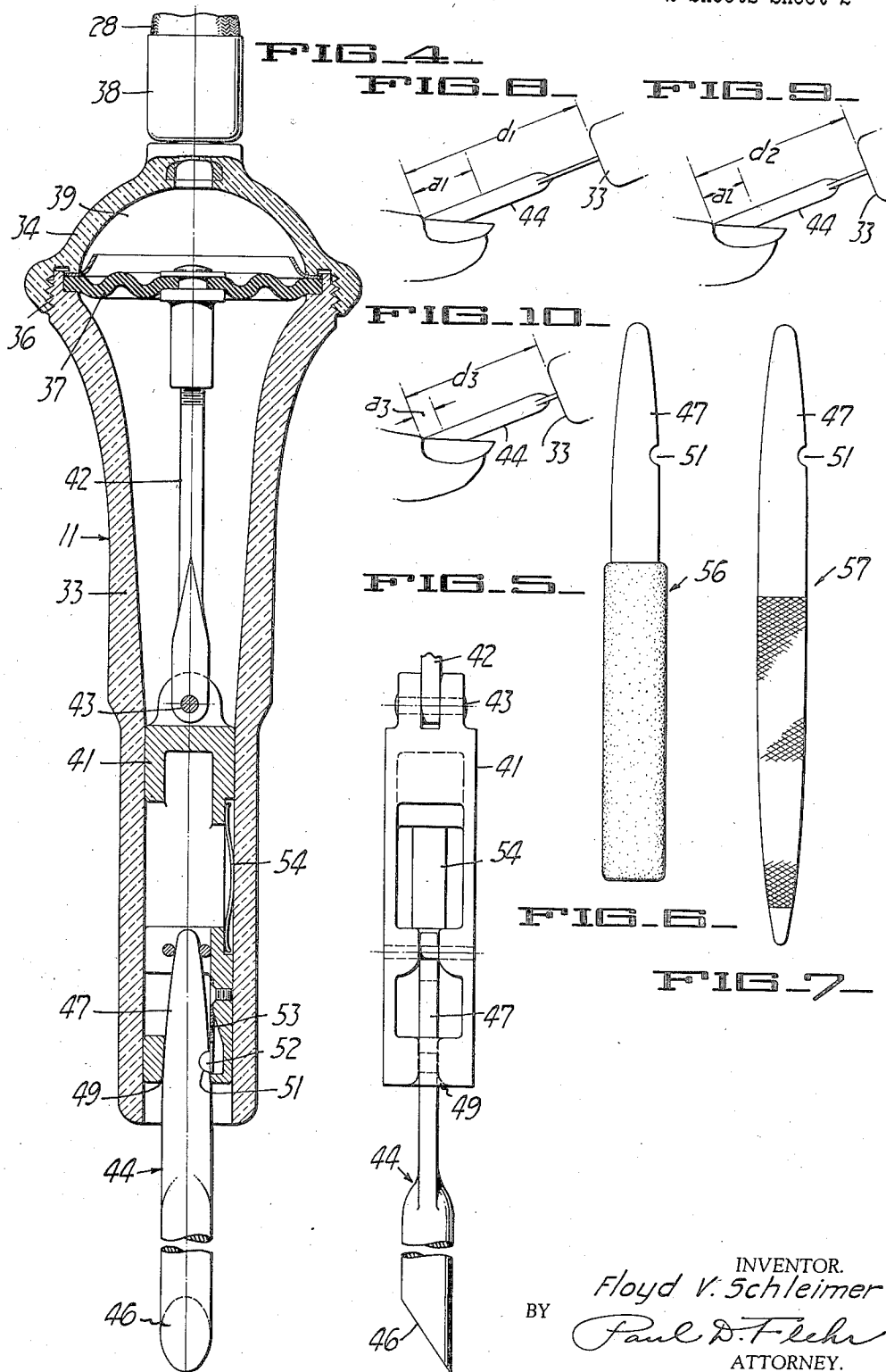
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## UNITED STATES PATENT OFFICE

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## POWER OPERATED MACHINE FOR MANICURING AND LIKE OPERATIONS

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5 Claims. (Cl. 132-74)

This invention relates generally to power operated machines for use by commercial beauticians. While various types of tools or instruments can be employed with the machine, it is of particular utility in carrying out manicuring operations.

It is a primary object of the invention to provide a machine of the above character which can be utilized without risk of pain or discomfort to the subject.

Another object of the invention is to provide a machine having its operating parts assembled in a novel manner, whereby the machine is compact and portable, and is at all times conveniently available for use.

Further objects of the invention will appear from the following description in which the preferred embodiments of the invention have been set forth, in conjunction with the accompanying drawings.

Referring to the drawings:

Fig. 1 is a side elevational view, showing the complete apparatus incorporating the present invention.

Fig. 2 is a plan view of the base plate utilized in conjunction with stand of Fig. 1, showing the driving motor and pneumatic pulsator.

Fig. 3 is a side elevational detail, in cross section, showing the raised portion of the stand, and the parts carried within the same.

Fig. 4 is a side elevational view, on an enlarged scale, showing the device adapted to be grasped by the hand of an operator, in operating the machine.

Fig. 5 is a detail, on an enlarged scale, showing the reciprocating block utilized in the device of Fig. 4, and also illustrating the manner in which tools are releasably held by such block.

Figs. 6 and 7 are views illustrating various manicuring tools, which can be utilized with the device of Fig. 4.

Figs. 8, 9 and 10 illustrate use of the machine in pushing back cuticle, and demonstrates the manner in which amplitude of reciprocation varies in accordance with the restraint placed upon the tool.

Referring first to Fig. 1, the machine consists of a stand 10, in conjunction with the pneumatically operated device 11. The base portion of the stand includes a base plate 12, to which the shell 13, is secured. Extending upwardly from the shell 13, there is a tubular upright 14, the upper end of which carries a casting 15. This casting is formed to provide a handle 16, by means of which the machine can be lifted and moved about, and

also to provide a bracket 17, for removably supporting the device 11.

Mounted upon the base plate 12, and within the shell 13, there is a pneumatic pulsator 18 and an electric motor 19. The body 21 of the pulsator can be formed integral with the base plate 12, and is formed to afford a closed chamber 22, one side of which is formed by the flexible diaphragm 23. The center of diaphragm 23 is connected to the lower end of a rod 24, the upper end of which connects with an eccentric 26 on the shaft of motor 19. A tube 27 connects with chamber 22, and is adapted to be coupled to one end of the flexible tube or hose 28.

It will be apparent that when motor 19 is operated, rod 24 is reciprocated to vibrate the diaphragm 23, and thus produce periodic compression and rarefaction of air in chamber 22 and in the tube 28. By reference to Fig. 3, it will be noted that the flexible tube 28 extends upwardly through the tubular upright 14, and is of considerable length to enable free manipulation of the device 11. Likewise electrical conductors 31 extend upwardly through the tubular upright 14, to a suitable electrical switch 32, whereby operation of the electric motor can be conveniently controlled.

The device 11 is illustrated in detail in Fig. 4. It consists of an elongated hollow casing 33, of suitable material such as a casein plastic or a phenolic condensate product. The rear end portion of the casing is of enlarged diameter, and includes a closure cap 34, which is secured to the main body of the casing by suitable means, such as a threaded connection 36. Clamped between the body of the casing and the cap 34, there is a flexible diaphragm 37. While various materials can be utilized for this diaphragm, it can be conveniently made of soft vulcanized rubber. Suitable coupling means 38 serve to connect the cap 34 with the flexible tube 28, whereby this tube is placed in communication with the closed chamber 39 on the rear side of the diaphragm 37.

In the forward end portion of the casing 33, there is a block 41, which is free to slide in a longitudinal direction. A rod 42 has its forward end provided with a pivotal connection 43 to the block 41, and has its rear end attached to the center of diaphragm 37. Thus as the diaphragm 37 is vibrated by pneumatic pulsations in the chamber 39, block 41 is reciprocated.

Block 41 is provided with suitable means to enable attachment to a tool or other instrument with which the machine is to be used. In Figs. 4 and 5 the tool 44 has its end portion 46, shaped

for pushing back cuticle. The other end portion 47 of the tool is flattened and tapered to fit within a socket 49 formed in block 41. One edge of the tool portion 47 is shown provided with a notch 51, adapted to be engaged by detent 52. This detent is shown being carried by a spring 53, whereby it snaps within notch 51 as the tool is inserted in block 41, and whereby the tool can be readily detached by pulling outwardly upon the same. To secure substantially noiseless operation, the block 41 may carry a light leaf spring 54, which frictionally presses against the adjacent surface of the casing.

A side view of the manicuring tool 44 is illustrated in Fig. 5. A buffer tool 56, is shown in Fig. 6, while a nail file 57 is shown in Fig. 7. These tools can be optionally attached to the block 41, to enable various manicuring operations, including pushing back the cuticle, buffing nails, and filing the edges of the nails.

Operation of the machine can be described as follows: When the electric motor 19 is put in operation, pneumatic pulsations are transmitted through the flexible tube 28, to the closed chamber 39 behind diaphragm 37. These pulsations cause corresponding vibration of the diaphragm 37, to reciprocate the block 41. A particular characteristic of the machine is better understood by reference to Figs. 8, 9 and 10. In Fig. 8 the forward end of the casing 33, is at a distance  $d1$  from the cuticle being operated upon, and the tool 44 is being reciprocated to substantially its maximum extent, represented by the distance  $a1$ . Now as the casing 33 is advanced to the position shown in Fig. 9, the distance  $d2$  becomes considerably less, and also the amplitude of reciprocation  $a2$  is likewise diminished. Fig. 10 shows the casing advanced a further amount, with the amplitude of reciprocation  $a3$  further diminished. Any one of the positions such as represented by Figs. 8, 9 and 10, can be used in practice. In other words there is no critical positioning of the casing with respect to the surface being operated upon. The thrust against the cuticle is slightly increased as the casing is moved forwardly, but for any such position the force exerted by the end of the tool against the cuticle is insufficient to mutilate the skin, or to cause pain or discomfort to the subject. It will be evident that this mode of operation is far superior to a machine having positive drive means for reciprocating the tool, so that the tool is always reciprocated through a stroke of fixed length. Such a machine can be used only with extreme care, and unless held at a critical position with respect to the surface being operated upon, it will cause severe pain and possible mutilation of the cuticle.

The characteristics described above are also utilized when buffing nails or when utilizing a nail file, in place of a tool for pushing back the cuticle. For example if when utilizing a nail file, the surface of the file should be pressed against the skin, no harm will result, because the file will automatically diminish its amplitude of reciprocation, and will cause no abrasion. Likewise when employing a buffer, if the surface of the buffer should be pressed too hard against the nail, reciprocation of the buffer will automatically diminish or cease altogether, to avoid unpleasant heating.

I claim:

1. In a device of the character described, an

elongated hollow casing adapted to be grasped by the hand of an operator, a member slidably mounted on the forward end of the casing, said member being adapted to carry a tool, a flexible diaphragm carried within the rear end portion of the casing, there being a closed chamber formed on the one side of the diaphragm for receiving periodic pneumatic pulsations, and motion transmitting means connecting the diaphragm to said block, whereby the block is reciprocated, the amplitude of reciprocation being dependent upon the restraint against reciprocation placed upon said tool.

2. In a device of the character described, an elongated hollow casing adapted to be grasped by the hand of an operator, a block slidably mounted in the forward end of the casing, said block being adapted to carry a tool, a flexible diaphragm carried within the rear end portion of the casing, there being a closed chamber formed on the rear side of the diaphragm for receiving periodic pneumatic pulsations, and a rod having its one end connected to the diaphragm and having its other end extending forwardly through said casing and connected to said block, whereby said block is reciprocated, the amplitude of reciprocation being dependent upon the restraint against reciprocation placed upon said tool.

3. In a device of the character described, an elongated hollow casing adapted to be grasped by the hand of an operator, a block slidably mounted in the forward end of the casing, means carried by said block adapted to releasably engage a manicuring tool, a flexible diaphragm carried within the rear end portion of the casing, there being a closed chamber formed on the rear side of the diaphragm for receiving periodic pneumatic pulsations, and a rod disposed within said casing having its rear end connected to said diaphragm and having its other end extended forwardly within the casing and connected to said block, whereby the block is reciprocated, the amplitude of reciprocation being dependent upon the restraint against reciprocation placed upon said tool.

4. In a device of the character described, a hollow base, a pneumatic pulsator mounted within said base, a motor within the base adapted to drive said pulsator, a tubular standard extending upwardly from said base, a device including a reciprocable member adapted to be driven by pneumatic pulsations, and an extended flexible tube having its one end connected to said pulsator and having its other end connected to said device, said flexible tube extending upwardly through said tubular standard.

5. In apparatus of the character described, a hollow base, a pulsator mounted within said base, an electric motor mounted within said base and connected to drive said pulsator, a device including a reciprocable member adapted to be grasped by the hand of an operator, said device being operable by pneumatic pulsations, a tubular upright extending upwardly from said base, a support for said device carried by the upper end of said tubular upright, and an extended flexible tube having its one end connected to said pulsator and having its other end connected to said device, said tube extending upwardly through said tubular upright.

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