MACHINE FOR SANDING, BUFFING AND POLISHING FINGERNAILS AND TOENAILS

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A machine for sanding, buffing and polishing fingernails and toenails with a flat disc of abrasive, smoothing or polishing material, a disc mount made of flexible material to easily adhere the disc to, a rotationally reciprocating disc mounting platform to affix the disc mount to, a removable head that can be easily interchanged, a power transmission shaft to transfer power to the removable head, a motor, a rotationally reciprocating power transmission to change rotational motion of the motor to rotationally reciprocating motion, a battery, a body to house the power components, a 90 degree power transmission to change rotationally reciprocating motion of the power transmission shaft to rotationally reciprocating motion of the disc mounting platform, and a power transmission shaft receiver in the removable head to receive the power transmission shaft.
MACHINE FOR SANDING, BUFFING AND POLISHING FINGERNAILS AND TOENAILS

BACKGROUND OF THE INVENTION

[0001] This invention relates generally to the field of personal hygiene and more specifically to a machine for Sanding, Buffing and Polishing Fingernails and Toenails.

[0002] Fingernail and toenail finishing systems have been in use throughout history. New technology has not advanced the current rotating drum sander technology for decades. Hand held tools gave way to powered rotating drum sanders in the early 1920’s. Today there are millions of these type of sander/polisher tools in use around the world.

[0003] The most basic nail finishing device is the emery board. This is a hand held and operated device that takes a skilled operator and a lot of time to get the nails smooth. Further prior technology for fingernail sanding and polishing systems in use today rely on a spinning sanding paper drum supported inside and locked into place by a rubber core that expands to hold the drum secure when a screw is tightened in the end of the mounting shaft. This shaft is directly attached to the armature of the motor that drives it usually by a collet type mount.

[0004] Home devices utilize a small motor that is usually powered by a low voltage motor that receives power from a wall transformer. Some variations on this are a disc sander also mounted to the shaft or a 90 degree disc sander. Further variations include heavy duty salon models that require a remotely mounted motor and flexible transmission shaft that leads to a hand unit that has the spinning drum or disc. Note that all of these devices rotate in one direction only.

[0005] A new device uses an internal drum sander that one inserts the nail into the interior of the drum which is coated in abrasive material. These are the major nail finishing systems available today and have been in use since the 20’s or earlier.

[0006] Prior art technologies rely on a direct drive motorized rotating drum sander that has the following deficiencies.

[0007] First of all the devices according to prior art are not sensitive to the nail surface making the skill of the operator important to the operation of the device. The cuticle is situated between the skin of the finger and the growing nail plate fusing these structures together and providing a waterproof barrier. Damaging the cuticle can open the nail up to infection.

[0008] Secondly, the uni-directional rotating drum and disc devices tend to heat up the nail surface rapidly causing painful irritation and actual burning of the flesh under the nail that occurs so rapidly that the person whose nail is being sanded doesn’t react to the burn until it has already occurred.

[0009] Third of all, the devices according to the prior art cannot get into the crevice along the nail between the nail plate and the perionychium. The perionychium is the skin that overlies the nail plate on its sides. It is also known as the paronychial edge. The diameter of the drum and the depth of the crevice prohibits finishing this area of the nail without sanding the surrounding skin.

[0010] Fourth of all, the drum sander, by definition is a curved surface that makes it difficult for operators to create a flat surface on the nail bed as the drum tends to follow the natural undulations of the nail itself. Only the skill of the operator can remove the high spots and make an even surface on the nail, which is the ultimate goal of nail finishing.

[0011] Next, the devices according to prior art are under powered and tend to stop rotating under moderate pressure from the operator. This deficiency makes salons use a nail sander that utilizes a remotely powered device that has a large motor remotely hanging from a obtrusive stand connected to the sander with a flexible power transmission shaft. This extra power is needed to maintain the rotation of the drum when pressure is applied. Underpowered home units simply stop under pressure and the operator must ease up on the pressure to get the device according to the prior art to start rotating again.

[0012] Further, the prior technology for fingernail sanding and polishing systems in use today are not very user friendly when it comes to changing the grit of the sanding drum mounted on the shaft in the tool. A small screwdriver must be employed by the operator to release the pressure on the rubber core and allow the sanding drum to be pulled off. Oftentimes the sanding drum is stuck on the rubber core. A further method would have multiple complete shaft, rubber core and sanding drum assemblies available to interchange. This interchanging of sanding assemblies requires further tools such as a wrench and a shaft locking tool to loosen the collet type mount and allow the shaft of the sanding assembly to be pulled out and changed to a different size grit for lighter or heavier sanding or changing between customers at a nail salon to avoid cross contamination between customers of harmful bacteria or germs. Also the drums themselves are moderately expensive due the manufacturing involved to make each paper drum that backs the sanding paper.

[0013] Another example of prior art deficiencies is that prior art devices, when used on fungus-infected nails will throw microscopic spores into the air off the drum infecting an area as large as a room. Many podiatrists are not allowed to treat fungus nails in their offices anymore due to health regulations and fear of spreading infection.

[0014] Finally the devices according to the prior art cannot be used in the presence of any cooling agent or dust mitigating agent such as water. The spinning drum means that when used with water, the operator would need to take care that the drum does not come out of the water until it has stopped spinning or the contaminated water will be blown into the air. Also the paper nature of the drum structure in not conductive to wet use. Further the home units are not waterproof and usually have a low voltage power cord attached that may not shock the user, but the nature of water and electrical mixing makes the operator wary of using the device near water.

BRIEF SUMMARY OF THE INVENTION

[0015] The primary object of the invention is To provide a device that will sand, buff and polish fingernails and toenails without danger to surrounding skin.

[0016] Another object of the invention is To provide a device that will sand, buff and polish fingernails and toenails using a flat disc that operates in a rotationally reciprocating motion the definition of this motion is meant to define the motion of the sanding disc to rotate through 45 degrees, reverse rotational motion back 45 degrees and repeat at 6,000 cycles per minute without heating fingernails and toenails and burning skin underlying the fingernails and toenails.

[0017] Another object of the invention is To provide a device that will sand, buff and polish fingernails and toenails in nail crevice areas not accessible to other powered fingernail drum sanding machines.

[0018] A further object of the invention is To provide a device that will sand, buff and polish fingernails and toenails
using a flat disc that operates in a rotationally reciprocating motion that will quickly and easily flatten irregularities in fingernail surfaces.

[0019] Yet another object of the invention is to provide a device that will sand, buff and polish fingernails and toenails using a battery powered, portable, lightweight and easily maneuverable machine to rotate, sand and polish the contour of the fingernail without friction between the sanding medium and the nail stopping the sanding process.

[0020] Still yet another object of the invention is to provide a device that will sand, buff and polish fingernails and toenails using a disc of abrasive material that is easily changed when the abrasive is worn away.

[0021] Another object of the invention is to provide a device that will sand, buff and polish fingernails and toenails using a multitude of detachable heads each with different coefficient of abrasive material to allow successive smoothing of fingernails and toenails.

[0022] Another object of the invention is to provide a device that will sand, buff and polish fingernails and toenails using an abrasive disc backed by a flexible or semi flexible material.

[0023] Yet another object of the invention is to provide a device that will sand, buff and polish fingernails and toenails that utilizes rechargeable batteries.

[0024] Still yet another object of the invention is to provide a device that will sand, buff and polish fingernails and toenails wet or dry.

[0025] Another object of the invention is to provide a device that will aid in the application of liquid and gel nail care products.

[0026] Other objects and advantages of the present invention will become apparent from the following descriptions, taken in connection with the accompanying drawings, wherein, by way of illustration and example, an embodiment of the present invention is disclosed.

[0027] In accordance with a preferred embodiment of the invention, there is disclosed a machine for Sanding, Buffing and Polishing Fingernails and Toenails comprising: a flat disc of abractive, smoothing or polishing material, a disc mount made of flexible material to easily adhere said disc to, a rotationally reciprocating disc mounting platform to affix said disc mount to, a removable head that can be easily interchanged with multiple removable heads of varying abrasive and buffing or polishing discs, a power transmission shaft to transfer power to said removable head, a motor, a rotationally reciprocating power transmission to change rotational motion of said motor to reciprocating rotational motion of said disc mounting platform, a battery, a power switch on said body to control said motor on and off, a body to house said battery, said motor, said switch and said rotationally reciprocating power transmission, connecting wires to conduct power from said battery to said motor, a 90 degree power transmission to change oscillating rotational motion of said power transmission shaft to oscillating rotational motion of said disc mounting platform, and a power transmission shaft receiver to receive said power transmission shaft and transfer reciprocating rotational motion to said 90 degree power transmission.

BRIEF DESCRIPTION OF THE DRAWINGS

[0028] The drawings constitute a part of this specification and include exemplary embodiments to the invention, which may be embodied in various forms. It is to be understood that in some instances various aspects of the invention may be shown exaggerated or enlarged to facilitate an understanding of the invention.

[0029] FIG. 100 is a plan view of the invention.

[0030] FIG. 200 is an elevation view of the invention.

[0031] FIG. 300 is a cut away view of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0032] Detailed descriptions of the preferred embodiment are provided herein. It is to be understood, however, that the present invention may be embodied in various forms. Therefore, specific details disclosed herein are not to be interpreted as limiting, but rather as a basis for the claims and as a representative basis for teaching one skilled in the art to employ the present invention in virtually any appropriately detailed system, structure or manner.

[0033] Embodiments of the invention disclose a machine for sanding, buffing and polishing fingernails and toenails. The preferred embodiment is pictured in drawings FIG. 100, FIG. 200 and FIG. 300.

[0034] Turning to FIG. 100 there is shown a Body 17 which is shaped to fit comfortably in the hand without slipping when wet and is a reasonably light weight to allow ease of control, maneuverability of the device by the operator around the fingernails or toenails (nails). We further see a Removable Head 13 which allows the operator to easily change multiple heads of different grit and polishing means to allow successive sanding and polishing of the nails. There is a preferred embodiment Head Locking Means 18 that would require the operator to twist and lock the head on to the Body 17 and lock it in place so it will remain steadfast while the operator is applying the device to the nails. Other means may be a press friction fit, or a locking button that would be familiar to any schooled in the art. Extending from the Body 17 is a Power Transmission Shaft 14 which transfers power from the body 17 to the Removable Head 13 once the Head Locking Means 18 is engaged. The device would then be ready for sanding and polishing the nails. The Body 17 also has a convenient power switch of any type familiar to those schooled in the art of power switches. The preferred embodiment would be water proof or water resistant to allow use of the device in the presence of water or even submerged. The Removable Head 13 may be waterproof, but need not be. The Body 17 in the preferred embodiment would be water proof or water resistant with a sealing means where the Power Transmission Shaft 14 penetrates the body.

[0035] In accordance with the present invention, in FIG. 200 there is shown an elevation of the device and specifically a side view of the Removable Head 13. The preferred embodiment shows a Mounting Platform 10, Disc Mount 12 and a flat Abrasive Disc 11. These 3 components constitute a sanding assembly that is a rotationally reciprocating assembly and allows the novice or skilled operator to sand and polish fingernails and toenails without heating the sensitive underlying skin or nicking the cuticle which is painful and leads to infection. Rotating back and forth rather than complete circular rotation keeps the nail cool by reducing the friction and thus the heat on the nail. The preferred embodiment would rely on a flexible Disc Mount 12 to allow some shock absorption and to transmit less vibration to the fingernail and transfer heat away from the fingernail.

[0036] Turning to FIG. 300 there is further shown a cut away view of the Body 17. The Motor 19 is powered by the
Battery 20 controlled by the Power Switch 15 and connected by the Connecting Wires 23. The preferred embodiment would utilize a rechargeable battery and another embodiment might include an inductive charging system although many other power sources would work including a remote power source.

[0037] In accordance with an important feature of the present invention, there is shown in FIG. 300 the advantage of the current invention over prior art which is the fact that the Motor 19 transfers power through a Reciprocating Transmission 21 which changes rotational motion into reciprocal rotational motion so that the said assembly would rotate between 45 and 180 degrees and switch direction and rotate the equal amount of degrees back again ready to repeat. This reciprocating rotational motion is what reduces heat transfer to the nail and makes the device safe if it touches sensitive skin. The preferred embodiment rotates 45 degrees at 6000 rotations per minute but this exact embodiment should not limit the scope of the present invention as other degree rotations and rotations per minute combinations are possible. FIG. 300 also shows a cut away view of the removable Head 13. The cut away view shows a Power Transmission Shaft Receiver 24 that allows the Power Transmission Shaft 14 to easily slide and lock into the Power Transmission Shaft Receiver 24 when the Removable Head 13 is changed. The Power Transmission Shaft Receiver 24 and Power Transmission Shaft 14 lock together by a connecting means that can be of many types. The preferred embodiment is a simple half shaft male end of the Power Transmission Shaft 14 inserting into a female half shaft Power Transmission Shaft Receiver 24.

[0038] Operation of the device according to the present invention begins with the selection of the Removable Head 13 that has the appropriate grit size for the job of sanding a fingernail or toenail. The rougher the fingernail, the larger the grit. Generally the operator would start with a 120 wet and dry grit paper that has been affixed to said Disc Mount 12 by an adhesive attachment means, preferred embodiment being an adhesive that can be removed and replaced at will; “Peel and stick” is the term used by those schooled in the art. Other attachment means might be the hook and loop attachment known as “Velcro.” Once the appropriate Removable Head 13 is selected and attached the Body 17, the operator activates the device by pushing the Power Switch 15 which starts the reciprocating action of said sanding assembly. The operator then applies said sanding assembly to the fingernail or toenail and begins sanding. The shape of the sanding assembly allows the operator to sand all areas of the nail, including the crevice along the nail between the nail plate and the perionychium. The flat reciprocating disc sands the high ridges of the nail first until the entire nail is uniformly flat along the nail's curved natural form. The operator then changes the Removable Head 13 with another Removable Head 13 that already has a finer grit sandpaper. The preferred embodiment utilizes quick interchange ability of the Removable Head 13 so the sanding time is efficiently reduced. Successive finer sanding and polishing grits finish the nail to a high gloss shine. Generally four varying Removable Head 13 are used in the beginning to sand fingernail and toenails and subsequent touch up of the nails only require the final two smoothing and polishing grits. Once completed, the operator may remove the Removable Head 13 and in a commercial setting, throw the Removable Head 13 away to eliminate cross contamination of client fingernails or toenails. The device would then be placed in a charger to be recharged for the next use.

[0039] A further advantage of the present invention is its use to mitigate nail fungus in a safe manner. Fungus nails thicken over time and any sanding of the nail may contaminate a room or area with fungus spores that can spread to other people’s toe and finger nails. The device according to the present invention allows the sanding of infected nails wet or under water. This not only cools the nails during sanding, but also contains the spores in the water to be safely disposed of without contaminating surrounding areas. Further, using the device wet keeps the sanding means unclogged and extends the life of the sanding disc. In pedicure applications, the device would allow podiatrists to again treat infected nails in the office. Sanding and thinning infected nails also allows better penetration of topical anti-fungal nail treatments into the nail.

[0040] The device according to the present invention allows the polishing of nails without applying a nail coating that doesn’t allow the nail to breathe. Many women like a more natural approach to nail finishing without the use of sealing polishes and paints.

[0041] The current device would also allow the use of a detachable head with a disc of absorbent material that could easily apply nail gel and other natural products to the nail to enhance the nail’s health.

[0042] While the invention has been described in connection with a preferred embodiment, it is not intended to limit the scope of the invention to the particular form set forth, but on the contrary, it is intended to cover such alternatives, modifications, and equivalents as may be included within the spirit and scope of the invention as defined by the appended claims.

What is claimed is:

1. A machine for sanding, buffing and polishing fingernails and toenails comprising:
   a flat disc of abrasive, smoothing or polishing material;
   a disc mount made of flexible material to easily adhere said disc to;
   a rotationally reciprocating disc mounting platform to affix said disc mount to;
   a removable head that can be easily interchanged with multiple removable heads of varying abrasive and buffing or polishing discs;
   a power transmission shaft to transfer power to said removable head;
   a motor;
   a rotationally reciprocating power transmission to change rotational motion of said motor to reciprocating rotational motion;
   a battery;
   a power switch on said body to control said motor on and off;
a body to house said battery, said motor, said switch and said rotationally reciprocating power transmission; a connecting wires to conduct power from said battery to said motor; a 90 degree power transmission to change rotationally reciprocating motion of said power transmission shaft to rotationally reciprocating motion of said disc mounting platform; and a power transmission shaft receiver to receive said power transmission shaft and transfer rotationally reciprocating motion to said 90 degree power transmission.