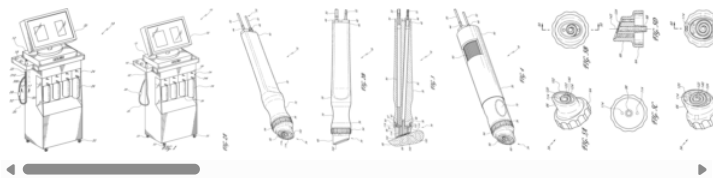


Devices and methods for treating skin

Abstract

An apparatus for treating skin has a console with a user input device and a handpiece assembly. The handpiece assembly is configured to treat skin. A fluid line provides fluid communication between the console and the handpiece assembly. A manifold system is coupled to the console and controlled by the user input device. The manifold system is configured to hold releasably a plurality of fluid sources and deliver fluid from at least one of the plurality of fluid sources to the handpiece assembly.

Images (26)



Classifications

■ A61M35/003

Portable hand-held applicators having means for dispensing or spreading integral media

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Worldwide applications

2006 [US](#) 2011 [US](#) 2015 [US](#) [US](#) [US](#) 2017 [US](#) [US](#) 2019 [US](#) 2021 [US](#) [US](#) 2023 [US](#) [US](#) 2024 [US](#)

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Claims (45)

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What is claimed is:

1. A system for treating skin, the system comprising:

a console configured to receive a first container and at least one additional container;

a handpiece configured to contact skin tissue of a subject; and

a block in the console, wherein the block is:

configured to selectively receive fluid from the first container when the first container is connected to the console;

configured to selectively receive fluid from the at least one additional container when the at least one additional container is connected to the console; and

configured to selectively be in fluid communication with the handpiece through a first conduit when the handpiece is connected to the console;

a vacuum source, wherein the console comprises the vacuum source; and

wherein the handpiece is configured to be in fluid communication with the vacuum source through a second conduit when the handpiece is connected to the console;

wherein when the handpiece, the first container, the at least one additional container and a waste container are each connected to the console, the first container contains a first treatment fluid, and the at least one additional container contains an additional treatment fluid,

the handpiece is in fluid communication with the vacuum source and the waste container through the second conduit; and

the system is configured to deliver the first treatment fluid contained in the first container and the additional treatment fluid contained in the at least one additional container to the handpiece sequentially.

2. The system of claim 1, wherein the at least one additional container comprises a second container and a third container such that the console is configured to receive at least three containers.

3. The system of claim 2,

wherein when the handpiece is connected to the console and the first container, the second container and the third container each contains fluid and is connected to the console, the system is configured to deliver to the handpiece one at a time fluid contained in the first container, fluid contained in the second container, and fluid contained in the third container.

4. The system of claim 1, further comprising a computing device configured to control at least one function of the system.

5. The system of claim 4, further comprising a user input device to select a flow of fluids from the first container and the at least one additional container to the handpiece.

6. The system of claim 5, wherein the user input device comprises a touch screen.

7. The system of claim 6, further comprising a display.

8. The system of claim 1, wherein the block is configured to control a flow of the first treatment fluid contained in the first container and the additional treatment fluid contained in the at least one additional container into the block with a valve when the first container and the at least one additional container are connected to the console.

9. The system of claim 1, wherein the system is configured to control a flow of the first treatment fluid contained in the first container to the handpiece through the block when each of the first container and the handpiece is connected to the console.

10. The system of claim 9, wherein the system is configured to separately control a flow of a second treatment fluid contained in the at least one additional container to the handpiece through the block when each of the first container, the at least one additional container, and the handpiece are connected to the console.

11. A skin treatment apparatus comprising:

a console that includes a fluid control member that is configured to be in fluid communication with at least a first container and a second container when the first container and the second container are connected to the fluid control member;

a handpiece assembly configured to contact a skin surface of a subject;

a waste conduit configured to be in fluid communication with the handpiece assembly and a vacuum source to move waste away from the handpiece assembly when the waste conduit and the handpiece assembly are each connected to the console; and

wherein when each of the first container and the second container are connected to the console, the fluid control member is configured to be in fluid communication with each of the first container and the second container;

wherein when the handpiece assembly is connected to the console, the fluid control member is configured to be in fluid communication with the handpiece assembly;

wherein when (i) each of the first container and the second container contains treatment material, (ii) the first container and the second container are connected to the console, and (iii) the handpiece assembly is connected to the console, the skin treatment apparatus is configured to selectively draw treatment material from the first container or the second container to the handpiece assembly using, at least in part, a vacuum created along a distal end of the handpiece assembly by the vacuum source.

12. The skin treatment apparatus of claim 11, wherein treatment material from the first container and the second container are configured to be drawn to the handpiece assembly sequentially.

13. The skin treatment apparatus of claim 11, wherein treatment material from the first container and the second container are configured to be drawn the handpiece assembly simultaneously.

14. The skin treatment apparatus of claim 11, wherein the console comprises the vacuum source.

15. The skin treatment apparatus of claim 11, wherein the skin treatment apparatus is configured to deliver a single treatment material from the first container to a patient's skin.

16. The skin treatment apparatus of claim 11, wherein the treatment material in the first container is a skin treatment fluid.

17. The skin treatment apparatus of claim 11, further comprising a computing device configured to control at least one function of the skin treatment apparatus.

18. The skin treatment apparatus of claim 17, further comprising a user input device to facilitate control of a flow of treatment materials from at least one of the first container and the second container to the handpiece assembly.

19. The skin treatment apparatus of claim 18, wherein the user input device comprises a touch screen.

20. The skin treatment apparatus of claim 19, further comprising a display.

21. The skin treatment apparatus of claim 11, wherein the fluid control member includes a first switch corresponding to the first container and a second switch corresponding to the second container, the first switch and the second switch configured to permit or prevent flow from the first container and the second container to independently control flow from each of the first container and the second container.

22. A system for treating skin, the system comprising:

a console configured to receive a first container and at least one additional container;

a collection lumen configured to be in fluid communication with the first container and the at least one additional container when the first container and the at least one additional container are connected to the console; and

a handpiece having a working end, the working end of the handpiece being configured to contact skin tissue of a subject during use;

wherein the working end of the handpiece is configured to be placed in fluid communication with a vacuum source to create a suction force along a distal end of the handpiece when the vacuum source is activated and the handpiece is connected to the console and wherein the working end of the handpiece is configured to be placed in fluid communication with the first container or the at least one additional container through the collection lumen; and

a supply conduit that places the collection lumen in fluid communication with the working end of the handpiece when the handpiece is connected to the console;

wherein each of the first container and the at least one additional container includes treatment materials, and wherein treatment materials from the first container and the at least one additional container are configured to be delivered to the supply conduit sequentially when the first container and the at least one additional container are connected to the console.

23. The system of claim 22,

wherein the console comprises the vacuum source;

wherein the handpiece is in fluid communication with the vacuum source and a waste container through a waste conduit when the handpiece and the waste container are connected to the console; and

wherein the system is configured to deliver a first treatment fluid contained in the first container and an additional treatment fluid contained in the at least one additional container to the handpiece sequentially or simultaneously when the first container and the at least one additional container are connected to the console.

24. The system of claim 22, further comprising a computing device configured to control at least one function of the system.

25. The system of claim 24, further comprising a user input device to facilitate control of a flow of fluids from the first container and the at least one additional container to the handpiece.

26. A system for treating skin, the system comprising:

a console configured to receive a first container and at least one additional container;

a handpiece configured to contact skin tissue of a subject; and

a block in the console, wherein the block is:

configured to selectively receive fluid from the first container when the first container is connected to the console;

configured to selectively receive fluid from the at least one additional container when the at least one additional container is connected to the console; and,

configured to selectively be in fluid communication with the handpiece through a first conduit when the handpiece is connected to the console; and

a vacuum source;

wherein the handpiece is configured to be in fluid communication with the vacuum source through a second conduit when the handpiece is connected to the console;

wherein the at least one additional container comprises a second container and a third container such that the console is configured to receive at least three containers; and

wherein when the handpiece is connected to the console and the first container, the second container and the third container each contains fluid and is connected to the console, the system is configured to deliver to the handpiece one at a time fluid contained in the first container, fluid contained in the second container, and fluid contained in the third container.

27. The system of claim 26, wherein the system is configured to combine in the block a first treatment fluid contained in the first container and an additional treatment fluid contained in the at least one additional container to create a mixture of treatment fluid.

28. The system of claim 26,

wherein the console comprises the vacuum source; and

wherein the handpiece is in fluid communication with the vacuum source and a waste container through the second conduit when the handpiece is connected to the console.

29. The system of claim 26, wherein the system is configured to deliver a first treatment fluid contained in the first container and an additional treatment fluid contained in the at least one additional container to the handpiece sequentially when the handpiece is connected to the console.

30. The system of claim 26, further comprising a computing device configured to control at least one function of the system.

31. The system of claim 30, further comprising a user input device to select a flow of fluids from the first container and the at least one additional container to the handpiece.

32. The system of claim 31, wherein the user input device comprises a touch screen.

33. The system of claim 32, further comprising a display.

34. The system of claim 26, wherein the block is configured to control a flow of a first treatment fluid contained in the first container and an additional treatment fluid contained in the at least one additional container into the block with a valve when the first container and the at least one additional container are connected to the console.

35. The system of claim 26, wherein the system is configured to control a flow of a first treatment fluid contained in the first container to the handpiece through the block when each of the first container and the handpiece is connected to the console.

36. The system of claim 35, wherein the system is configured to separately control a flow of a second treatment fluid contained in the at least one additional container to the handpiece through the block when each of the first container, the at least one additional container, and the handpiece are connected to the console.

37. A system for treating skin, the system comprising:

a console configured to receive a first container and at least one additional container;

a handpiece configured to contact skin tissue of a subject; and

a block in the console, wherein the block is:

configured to selectively receive fluid from the first container when the first container is connected to the console;

configured to selectively receive fluid from the at least one additional container when the at least one additional container is connected to the console; and,

configured to selectively be in fluid communication with the handpiece through a first conduit when the handpiece is connected to the console; and

a vacuum source;

wherein the handpiece is configured to be in fluid communication with the vacuum source through a second conduit when the handpiece is connected to the console;

wherein the system is configured to control a flow of a first treatment fluid contained in the first container to the handpiece through the block when each of the first container and the handpiece is connected to the console; and

wherein the system is configured to separately control a flow of a second treatment fluid contained in the at least one additional container to the handpiece through the block when each of the first container, the at least one additional container, and the handpiece are connected to the console.

38. The system of claim 37, wherein the system is configured to combine in the block the first treatment fluid contained in the first container and the second treatment fluid contained in the at least one additional container to create a mixture of treatment fluid.

39. The system of claim 37,

wherein the console comprises the vacuum source; and

wherein the handpiece is in fluid communication with the vacuum source and a waste container through the second conduit when the handpiece is connected to the console.

40. The system of claim 37, wherein the system is configured to deliver the first treatment fluid contained in the first container and the second treatment fluid contained in the at least one additional container to the handpiece sequentially when the handpiece is connected to the console.

41. The system of claim 37, further comprising a computing device configured to control at least one function of the system.

42. The system of claim 41, further comprising a user input device to select a flow of fluids from the first container and the at least one additional container to the handpiece.

43. The system of claim 42, wherein the user input device comprises a touch screen.

44. The system of claim 43, further comprising a display.

45. The system of claim 37, wherein the block is configured to control the flow of the first treatment fluid contained in the first container and the second treatment fluid contained in the at least one additional container into the block with a valve when the first container and the at least one additional container are connected to the console.

Description

REFERENCE TO RELATED APPLICATIONS

This is a continuation of U.S. patent application Ser. No. 17/165,820 filed Feb. 2, 2021, which is a continuation of U.S. patent application Ser. No. 16/517,268 filed Jul. 19, 2019 and issued as U.S. Pat. No. 11,446,477 on Sep. 20, 2022, which is a continuation of U.S. patent application Ser. No. 15/660,750 filed Jul. 26, 2017 and issued as U.S. Pat. No. 10,357,641 on Jul. 23, 2019, which is a continuation of U.S. patent application Ser. No. 14/700,789 filed Apr. 30, 2015 and issued as U.S. Pat. No. 9,814,868 on Nov. 14, 2017, which is a continuation of U.S. patent application Ser. No. 13/267,554 filed Oct. 6, 2011 and issued as U.S. Pat. No. 9,474,886 on Oct. 25, 2016, which is a continuation of U.S. patent application Ser. No. 11/392,348 filed Mar. 29, 2006 and issued as U.S. Pat. No. 8,048,089 on Nov. 1, 2011, which claims the benefit of U.S. Provisional Application No. 60/755,310 filed Dec. 30, 2005 and U.S. Provisional Application No. 60/764,668 filed Feb. 2, 2006. The entireties of all of the aforementioned applications are hereby incorporated by reference herein.

BACKGROUND

Field

The invention relates in general to the field of skin treatment, and more specifically to apparatuses and methods for treating a person's skin.

Description of the Related Art

Abrasion of the outer layer or epidermis of the skin is desirable to smooth or blend scars, blemishes, or other skin conditions that may be caused by, for example, acne, sun exposure, and aging. Standard techniques used to abrade the skin have generally been separated into two fields referred to as dermabrasion and microdermabrasion. Both techniques remove portions of the epidermis called the stratum corneum, which the body interprets as a mild injury. The body then replaces the lost skin cells, resulting in a new outer layer of skin. Additionally, despite the mild edema and erythema associated with the procedures, the skin looks and feels smoother because of the new outer layer of skin.

Dermabrasion refers to a procedure in which the surface of the skin is removed due to mechanical rubbing by a handpiece with an abrasive element that is often in the form of a burr, wheel, or disc. This process tends to be painful and messy. In fact, the procedure is sometimes painful enough to require a local anesthetic. Dermabrasion leaves the skin red and raw-looking. The removed skin can take several months to regrow and heal. Recent efforts have led to the use of lasers instead of abrasive elements, which have resulted in less bleeding, but the pain and mess remains.

Efforts have been made to decrease the mess caused by the process waste, such as removed skin and blood, by adding a suction element. As the process waste is drawn into the suction opening, skin that has not been removed is also pulled against the grit surrounding the suction opening, so the procedure remains fairly messy due to the abrasion that takes place outside of the handpiece by the grit.

Microdermabrasion refers generally to a procedure in which the surface of the skin is removed due to mechanical rubbing by a handpiece emitting a stream of sand or grit. For example, a handpiece can be used to direct an air flow containing tiny crystals of aluminum oxide, sodium chloride, or sodium bicarbonate. The momentum of the grit tends to wear away two to three cell layers of the skin with each pass of the handpiece. Alternatively, new "crystal-free" microdermabrasion techniques utilize a diamond-tipped handpiece without a stream of grit.

Efforts to add a suction element have been more successful in microdermabrasion than in dermabrasion because the handpiece applying the stream of grit is more controllable to a localized area. That is, as the removed skin is drawn into the suction opening, skin that has not been removed is also pulled towards the handpiece where it is treated with the grit stream, allowing for simultaneous local treatment and suction.

Microdermabrasion removes moisture from the skin, so the procedure is always followed by the application of moisturizing creams. However, similar to topical application of moisturizing creams prior to microdermabrasion, the moisturizing elements only work as deep as the active ingredients can passively migrate through the remaining epidermis.

SUMMARY

In some embodiments, an apparatus for treating skin has a console with a user input device and a handpiece assembly. The handpiece assembly is configured to treat skin. A fluid line provides fluid communication between the console and the handpiece assembly. A manifold system is coupled to the console and controlled by the user input device, such as a computer, touchscreen, keyboard, and the like. The manifold system is configured to hold releasably a plurality of fluid sources and deliver fluid from at least one of the plurality of fluid sources to the handpiece assembly.

In some embodiments, a tip comprising a skirt portion is configured to couple to a handpiece for treating a target area on a patient's skin. A central body portion is coupled to the skirt portion. A first passage extends through the central body portion and is configured to receive a fluid from the handpiece. At least one second passageway extending through the central body portion and is configured to convey the fluid back into the handpiece. An inner member extends in a generally spiral fashion across at least a portion of a distal face of the central body portion. The inner member defines a channel between the first passage and the at least one second passage. When the tip is placed against the skin, a chamber can be formed by the channel and the person's skin.

In some embodiments, a method of treating a target region on a patient's skin comprises providing a tip including a first aperture and at least one second aperture. At least one inner member on the surface of the tip defines at least one channel between the first aperture and the at least one second aperture. An outer member is disposed on the surface of the tip. The outer member engages the target with the tip. A treatment fluid flows distally through the first aperture region and through the at least one channel. The treatment fluid flows proximally through the at least one second aperture.

In some embodiments, a tip comprises a skirt portion configured to couple to a handpiece for treating a target on a patient's skin. A central body portion is coupled to the skirt portion and includes a mounting region substantially opposite the skirt portion. The mounting region configured to receive a pad for treating the skin. A first aperture extends through the skirt portion and the central body portion and configured to receive a fluid from the handpiece. At least one second aperture extending through the skirt portion and the central body portion and configured to convey the fluid back into the handpiece.

In some embodiments, a method of treating a target region of a patient comprises providing a tip including a first aperture, at least one second aperture, and a distal end configured to receive a pad. In some variations, the first pad is attached to the distal end. The tip is engaged with the target region.

In some embodiments, a manifold system comprises a body portion configured to receive releasably at least two bottles. The manifold is configured so that it can be coupled to a console. The console includes a handpiece for treating skin. At least one elongate member is in communication with a pump and configured to extract a fluid from one of the at least two bottles. At least one switch is configured to permit or inhibit a flow of the fluid from one of the at least two bottles through the pump. In some variations, the elongate member is dimensioned to fit within one of at least two bottles to draw fluid out of the bottle.

In some embodiments, a method of treating a target region on a patient's skin comprises engaging a tip with the patient's skin such that an effective amount of skin is removed by the tip. In some variations, the tip is a dry tip. After removing an effective amount of skin, another tip (e.g., a wet tip) engages the patient's skin such that an effective amount of skin is removed by the tip. In some variations, acid is delivered out of the wet tip to facilitate skin removal. In some variations, the wet tip includes a first aperture, at least one second aperture, at least one inner member on the surface of the tip defining at least one channel between the first aperture and the at least one second aperture, and an outer member on the surface of the tip. In some variations, treatment fluid flows outwardly along the channel. In some variations, treatment fluid flows inwardly along the channel. In some variations, the wet tip comprises an abrasive pad.

In some embodiments, a method of treating a target region on a patient's skin comprises engaging a first skin treatment tip with the patient's skin. A first material is delivered out of the first skin treatment tip to a target region. A second skin treatment tip engages the target region while the first material effectively facilitates exfoliation with the second skin treatment tip. In some variations, the first material comprises an acid, hydrator, and combination thereof. In some variations, the first skin treatment tip is configured to remove skin at a different rate than the second skin treatment tip. In some variations, the first skin treatment tip is configured to exfoliate at a higher rate than the second skin treatment tip. In some variations, material is delivered out of the second treatment tip to the target region of the patient's skin.

The apparatus for treating skin can dispense treatment material that is held in containers, such as bottles, bags, pouches, or other suitable structures for holding and storing material. These containers can be non-refillable or refillable. The treatment material can be delivered by gravity feed, pumps, or suction devices. The manifold system can be used to control fluid flow from a plurality of containers to one or more handpieces.

BRIEF DESCRIPTION OF THE DRAWINGS

Having thus summarized the general nature of the invention, certain preferred embodiments and modifications thereof will become apparent to those skilled in the art from the detailed description herein having reference to the figures that follow.

FIG. 1 is a perspective view of one embodiment of a skin treatment system.

FIG. 2A is a perspective view of one embodiment of a handpiece assembly for use with the skin treatment system of FIG. 1.

FIG. 2B is a side elevational view of the handpiece assembly of FIG. 2A.

FIG. 3 is a longitudinal cross-sectional view of the handpiece assembly of FIG. 2B. The handpiece assembly is engaging a person's skin.

FIG. 4 is a perspective view of another embodiment of a handpiece assembly.

FIG. 5A is a perspective view of one embodiment of a tip that can be coupled to a main body of a handpiece assembly to treat a person's skin.

FIG. 5B is a top elevational view of the tip of FIG. 5A.

FIG. 5C illustrates a bottom elevational view of the tip of FIG. 5A.

FIG. 5D is a cross-sectional view of the tip of FIG. 5B taken along the line 5D-5D.

FIG. 6A is a perspective view of a tip in accordance with another embodiment.

FIG. 6B is a top elevational view of the tip of FIG. 6A.

FIG. 6C is a bottom elevational view of the tip of FIG. 6A.

FIG. 6D is a cross-sectional view of the tip of FIG. 6B taken along the line 6D-6D.

FIG. 7A is a perspective view of a tip in accordance with another embodiment.

FIG. 7B is a top elevational view of the tip of FIG. 7A.

FIG. 7C is a bottom elevational view of the tip of FIG. 7A.

FIG. 7D is a cross-sectional view of the tip of FIG. 7B taken along the line 7D-7D.

FIG. 8A is a perspective view of yet another embodiment of a tip for treating a person's skin.

FIG. 8B is a top elevational view of the tip of FIG. 8A.

FIG. 8C is a bottom elevational view of the tip of FIG. 8A.

FIG. 8D is a cross-sectional view of the tip of FIG. 8B taken along the line 8D-8D.

FIG. 9A is a perspective view of still another embodiment of a tip that can be coupled to a main body of a handpiece assembly.

FIG. 9B is a top elevational view of the tip of FIG. 9A.

FIG. 9C is a bottom elevational view of the tip of FIG. 9A.

FIG. 9D is a cross-sectional view of the tip of FIG. 9B taken along the line 9D-9D.

FIG. 10A is a perspective view of another embodiment of a tip for treating a person's skin.

FIG. 10B is top elevational view of the tip of FIG. 10A.

FIG. 10C is bottom elevational view of the tip of FIG. 10A.

FIG. 10D is a cross-sectional view of the tip of FIG. 10B taken along the line 10D-10D.

FIG. 10E is a perspective exploded view of the tip of FIG. 10A, wherein a pad is spaced from a tip main body.

FIGS. 11A-11E are cross-sectional views of inner members that can be used to exfoliate skin.

FIG. 12 is a perspective view of a bottle for use with the skin treatment system of FIG. 1.

FIG. 13A is a cross-sectional view of one embodiment of a bottle spaced from an insertion tip assembly.

FIG. 13B is a cross-sectional view of the bottle of FIG. 13A coupled with the insertion tip assembly.

FIG. 14A is a cross-sectional view of a closure and a bottle.

FIG. 14B is a cross-sectional view of the closure and bottle of FIG. 14A when assembled.

FIG. 15A is a perspective view of one embodiment of a manifold system holding a plurality of bottles.

FIG. 15B is a cross-sectional view of the manifold system of FIG. 15A taken along the line 15B-15B of FIG. 15A.

FIG. 15C is a cross-sectional view of the manifold system of FIG. 15A taken along the line 15C-15C of FIG. 15A.

FIG. 15D is a cross-sectional view of the manifold system of FIG. 15C wherein the bottle has been removed.

FIG. 15E is a cross-sectional elevational view of the manifold system.

FIG. 16 is a perspective view of another embodiment of a skin treatment system.

FIG. 17 is a cross-sectional view of a fluid line of the skin treatment system of FIG. 16 taken along the line 17-17.

FIG. 18 is a side elevational view of a handpiece assembly with a removable cartridge.

FIG. 19 is a side elevational view of the handpiece assembly and removable cartridge of FIG. 18, the cartridge is shown removed from the handpiece assembly.

DETAILED DESCRIPTION

FIG. 1 illustrates a skin treatment system 10 that can be used to perform one or more treatments on a person's skin. The illustrated skin treatment system 10 includes a console 12 and a handpiece assembly 18 connected to the console 12 via a line 20. A manifold system 24 can control the flow of treatment material from containers 26 into and through the line 20. The treatment material can be discharged out of the handpiece assembly 18 to treat a person's skin. The skin treatment system 10 can be used at a hospital, health care physicality, residences, or any other suitable location.

As explained in more detail below, the handpiece assembly 18 is applied to the target area of the patient to perform skin treatment(s). As used herein, the term "skin treatment" is a broad term and includes, but is not limited to, skin removal, skin abrasion (e.g., dermabrasion, microdermabrasion, etc.), ablating or slicing skin (preferably a thin layer of skin), stimulation (including thermal, mechanical, electrical, and/or chemical stimulation), mesotherapy, isophoresis, light therapy, vacuum therapy, and the like. Preferably, the handpiece assembly 18 administers a treatment material from at least one of the containers 26 through the line 20 to the target area of the skin while the handpiece assembly 18 engages the skin.

As used herein, the term "treatment material" is a broad term and includes, but is not limited to, medicament, a substance tending to flow or conform to the outline of its container such as fluid, gas, liquid (e.g., serums, water, saline, etc.), gel, fluidized material, additives, and/or a plurality of fine solids. The general term "fluid" is used throughout synonymously with the term "treatment material" and is to be given the same broad definition. The handpiece assembly 18 can preferably massage, abrade, ablate, or otherwise treat the target skin area while also applying a treatment material to the patient. In certain embodiments, the treatment material and tip of the handpiece **18** can work in combination for an effective and rapid skin treatment. Additionally, any number of "dry" and "wet" tips can be used alone or in combination for treatment flexibility.

With continued reference to FIG. 1 the line **20** is configured to provide fluid communication between the containers 26 and the handpiece assembly 18. The line **20** can comprise one or more conduits extending between the console **12** and the handpiece assembly **18**. In certain embodiments, the line **20** includes a supply line and a waste line for delivering and returning material, respectively, as detailed below.

The distal end **22** of the line **20** is connected to the handpiece assembly **18**. Preferably, the line **20** includes a filter **28** that removes contaminants or impurities from the treatment material passing through the line **20**. In other embodiments, the filter **28** is located in the console **12** or the manifold system **24**. The console **12** can be connected to a power source such as an AC outlet. The power source can power the handpiece assembly **18** and/or other components of the skin treatment system **10**, such as, for example, pumps, valves, and the like.

In the illustrated embodiment, the console **12** comprises four casters **33** to allow for easy movement, for example, from one treatment room to another treatment room. In such an embodiment, the console **12** can be conveniently rolled on a support surface. Other means of transportation can also be employed or the console **12** can be stationary. In some embodiments, the console **12** is portable for convenient transport.

The illustrated containers **26** of FIG. 1 are preferably releasably coupled to the manifold system **24**. The manifold system **24** can deliver treatment material from the containers **26** to the line **20** as mentioned above. In certain embodiments, the console **12** has a user input device **32** for selecting a treatment material to be passed through the line **20** to the handpiece assembly **18**. During some skin treatment procedures, treatment materials from multiple containers **26** are sequentially or simultaneously applied to the patient's skin during a "wet" mode of operation. Alternatively, the skin treatment system **10** can be used to deliver a single treatment material to the patient's skin. In some embodiments, the console **12** can be used for a "dry" mode of operation. That is, the console **12** can be used to exfoliate skin, for example, without delivering little or substantially no treatment fluid. The skin treatment system **10** can thus provide flexibility in selecting a treatment plan.

Multiple handpieces assemblies **18** and/or tips **34** can be used during a single skin treatment procedure in a wet and/or dry mode of operation. For example, a first handpiece assembly **18** may be employed to treat a patient's face and neck while a second handpiece assembly **18** may be employed to treat other larger areas of the patient's body. Thus, different handpieces **18** can be used to treat different regions of a person's body. The configurations of the handpieces **18** and tips can be selected based on the treatment material to be applied, desired interaction with the patient's skin, size of treatment area, skin condition, and the like.

With reference to FIGS. 2A and 2B, the handpiece assembly **18** includes a main body **30** and a tip **34**. The handpiece assembly **18** can be conveniently held within the hand of a user so that the user can place the tip **34** in operative engagement with a person's skin. The user is typically an aesthetician (e.g., an aesthetician allowed to perform microdermabrasion), doctor, and other medical personnel, such as a physician assistant and nurse practitioner. In some cases, the user is the person whose skin is being treated.

The main body **30** has contoured portions **70** at its distal end **36** so that the user can comfortably grip the handpiece assembly **18** during use. The main body **30** can have other designs to provide a comfortable grip. FIG. 2A illustrates an embodiment in which the main body **30** is substantially flat on two opposing sides. FIG. 4 illustrates an embodiment in which the main body **30** is generally cylindrical.

As noted above, the tip **34** can be pressed against a patient's skin to perform a skin treatment. The distal end **102** of the tip **34** may be angled with respect to the handpiece assembly **18** to increase the contact area with the patient's skin without enlarging the handpiece assembly **18** for an ergonomic and comfortable design. The angled tip **34** can lay flat on the skin while the main body **30** is angled to the skin. The angle between the face of the distal end **102** and the longitudinal axis of the handpiece assembly **18** can be selected based on the desired size of the face of the distal end **102**. In alternative embodiments, the face of the distal end **102** is generally perpendicular to the longitudinal axis of the main body **30**.

The tip **34** can be permanently or temporarily coupled to the distal end **36** of the main body **30**. In some embodiments, the tip **34** is disposable. As used herein, the term "disposable," when applied to a system or component (or combination of components), such as a tip, container, or pad, is a broad term and means, without limitation, that the component in question is used a finite number of times and then discarded. Some disposable components are used only once and then discarded. Other disposable components are used more than once and then discarded. In some embodiments, the tip **34** is removably coupled to the main body **30** such that the tip may be removed from the main body **30** and thrown away to avoid cross-contamination. In other embodiments, the tip **34** is a reusable tip that can be cleaned, for example by autoclaving, after each use. The tip **34** can thus be used for any number of procedures as desired.

With reference to FIGS. 2A and 2B, the proximal end **40** of the main body **30** is operatively connected to the line **20**. In the embodiment illustrated, the line **20** includes an output line **50** for removing waste from the handpiece assembly **18** and an input line **52** for delivering treatment material to the handpiece assembly **18**. The proximal end **40** of the main body **30** includes a plurality of connectors **44, 46**, each connected to one of the conduits **50, 52**. The illustrated input line **52** is connected to the connector **46**, and the output line **50** is connected to the connector **44**.

The input line **52** delivers treatment material from at least one of the containers **26** to the connector **46**. The fluid then flows through the main body **30** and ultimately to the tip **34**. As shown in FIG. 3, the main body **30** comprises a plurality of lumens **90, 92** in a fluid communication with the tip **34**. Fluid from the input line **52** can flow through the input lumen **92** to the tip **34**. The fluid then flows out of the tip **34** to a target skin area. The fluid is then trapped in the space **100** between the skin **80** and the tip **34**. To remove the fluid, the fluid flows proximally through the lumen **90** to the output line **50**. The fluid passes through the output line **50** and into the console **12**. As such, fluid can continuously or intermittently flow through the handpiece assembly **18**.

To treat the person's skin **80**, the handpiece assembly **18** can also be moved relative to the skin **80** such that the tip **34** maintains engagement with the skin **80**. The illustrated tip **34** is configured to massage the skin **80** while also providing fluid communication with the skin **80**. As detailed below in connection with FIGS. 5A through **10**, the tip can include sharp planing blades, blades (e.g., razor blades), raised sharp areas, molded posts, grits, or other structures for treating skin, as detailed below.

When the tip **34** and treatment material are used in combination, the handpiece assembly **18** preferably exfoliates dead skin cells and extracts impurities by applying a vacuum while simultaneously bathing the healthy underlying skin with active treatment material. The active treatment material can facilitate cleansing, exfoliating, hydrating, and/or provide residual antioxidant protection. The treatment material and tip **34**, alone or in combination, can effectively and rapidly treat the target skin area. The waste material, including the used treatment material, removed skin, and/or grit, can then be drawn back through the tip **34**, the main body **30** via lumen **90**, and into the connector **44**. The waste then flows into the output line **50** for subsequent disposal, as detailed below in connection with FIG. 4.

In some embodiments, including the illustrated embodiment of FIG. 3, the tip **34** has a tip connector **98** (see FIGS. 5C and 5D) that mates with the lumen **92**. The tip **34** can provide fluid communication from the tip connector **98** to the space **100** via a through-hole **122**. One or more through-holes **114** define fluid passageways through the tip **34** between the space **100** and the intermediate chamber **116**.

The intermediate chamber **116** can be interposed between the through-holes **114** and the lumen **90**. The intermediate chamber **116** is preferably defined by the distal face **43** of the main body **30** and the proximal face **41** of the tip **34**. The intermediate chamber **116** can provide equalization of fluid between the tip **34** and the body **30**. As such, a generally equal vacuum is applied to both through-holes **114**. The fluid can flow through the through-holes **114**, into the intermediate chamber **116**, and then into the lumen **90**. In some embodiments, however, the fluid flows directly from the through-holes **114** to the lumen **90** without passing through an intermediate chamber **116**.

The tip **34** can have one or more sealing members to form a fluidic seal between the tip **34** and the main body **30**. The illustrated main body **30** includes a sealing member **47** that engages the inner surface of the skirt **64** of the tip **34**. The sealing member **47** can be a compliant member comprising rubber, polymer, plastic, or other suitable material for forming seals. In some embodiments, the sealing member **47** is an O-ring made of rubber.

With continued reference to FIG. **3**, during use, treatment material can flow distally through the lumen **92** into the through-hole **122**. The treatment material then proceeds through and out of the through-hole **122** into the space **180**. Preferably, the treatment material spreads radially outward to the peripheral through-holes **114**. The material can then flow through the through-holes **114** into the lumen **90** for subsequent removal.

In alternative embodiments, the fluid flows in the opposite direction. That is, the line **50** delivers fluid through the lumen **90** into the tip **34**. The fluid flows through the intermediate chamber **116** and the through-holes **114**. The fluid then flows to the chamber **100** and inwardly through the tip connector **98** to the lumen **92**. The fluid proceeds proximally along the lumen **92** and ultimately into the line **52**.

In yet another embodiment, the handpiece assembly **18** comprises two or more input lumens **90**. Such a design allows mixing of two or more treatment materials within the handpiece assembly **18** or space **100**, which would be useful for treatments with fluids that react or are unstable or degrade when stored or mixed.

As depicted in FIG. **4**, the handpiece assembly **18** can optionally include a controller **60** that is configured to control the fluid flow out of the tip **34**. The illustrated controller **60** can be operated to increase or decrease the flow rate of treatment fluid out of the tip **34**. Alternatively or additionally, the controller **60** may control the flow rate of waste fluid flowing through the handpiece assembly **18** to the output line **50**. When control of the waste treatment fluid and waste fluid is independent, the detention time of the fluid in the tip **34** may be adjusted as desired.

The illustrated controller **60** is a generally cylindrical body that is pivotally connected to the main body **30**. FIG. **4** illustrates an embodiment in which the controller **60** is recessed into and partially hidden by the main body **30**, although in other embodiments the controller **60** may encircle the main body **30**. The controller **60** may include textured grooves to provide for easier manipulation. In some embodiments, the controller **60** is located near the distal end **36** of the handpiece assembly **18** proximal or distal of the contoured portion **70**. The type and configuration of the controller **60** can be selected based on the design of the handpiece assembly **18**. The controller **60** can also be a rotatable knob or handle, digital controller, and the like.

The handpiece assembly **18** can also include one or more flow rate controllers within the main body **30** that cooperate with the controller **60** to adjust the fluid flow out of the tip **34**. For example, the controller **60** may comprise a flow control valve such as a globe valve, butterfly valve, needle valve, or variable orifice. Other types of flow rate controllers can also be used, such as an electrically controlled solenoid valve. In embodiments where the fluid flow is electronically controlled, the valve system may alternatively be located in the console **12** or manifold system **24**. Separate devices can also be used to control the flow of treatment material. For example, clamps, pinch valves, or other suitable devices can be used to control fluid flow through the lines **50, 52**.

Various types of tips **34** can be used with the handpiece assemblies **18** illustrated in FIGS. **1** to **4**. FIGS. **5A** through **10E** illustrate embodiments, for example, of tips **34** that can be used with these handpiece assemblies **18**. These tips **34** can be interchangeable to provide maximum treatment flexibility.

As shown in FIGS. **5A** through **10E**, the tip **34** comprises the skirt **64** and a tip main body **66** extending outwardly therefrom. The skirt **64** is preferably configured to provide a gripping surface suitable for applying leverage or force sufficient to remove the tip **34** from the main body **30**. In some embodiments, the skirt **64** includes internal threads such that it can be mechanically coupled to external threads on the distal end **36** of the main body **30**. In some embodiments, the tip **34** can be press fit onto the main body **30**. Frictional forces can retain the tip **34** to the main body **30**.

With respect to FIGS. **5A** through **7**, the tip **34** comprises an outer member **120** and an inner member **124**. The outer member **120** preferably defines the periphery of the distal end **102** of the tip **34**. When the tip **34** is placed against skin, the outer member **120** can inhibit fluid flow between the tip **34** and the skin and define the outer portion of the space **100**.

The inner member **124** is preferably spaced from the outer member **120** to define one or more channels. The illustrated outer member **120** defines a continuous channel **140** that extends outwardly from the central through-hole **122** towards at least one of the outer through-holes **114**. The inner member **120** can form the sidewalls of the channel **140**. Any suitable configuration of channels **140** can be used to provide fluid flow along a flow path. The illustrated channels **140** have a somewhat U-shaped axial cross-sectional profile, as depicted in FIG. **8A**. The channel **140** can have a V-shaped, curved, or any other suitable cross sectional profile. A flow path between the through-holes in the tip **34** can be defined at least in part by the channels.

The spiral-like pattern of the inner members **124** in FIGS. **5** through **7** varies. For example, the inner member **124** in FIG. **5** extends about a longitudinal axis **143** of the tip **34** approximately one and a half times, the inner member **124** in FIG. **6** extends about the tip **34** approximately two and a half times, and the inner member **124** in FIG. **7** rotates about the tip **34** approximately one and three quarters times. In some embodiments, the inner member **124** subtends an angle of about 70°, 135°, 180°, 210°, 225°, 270°, 315°, 360°, and angles encompassing such ranges. In yet other embodiments, the inner member **124** subtends an angle of about 405°, 450°, or 495°. The tightness of the spiral in combination with the location and number of through-holes **114** affects the detention time of the fluid in the channel **140**. Generally, a tighter spiral results in a longer the pathway (i.e., the length of the channel **140**) from delivery through-hole **122** to the return through-holes **114**. Fluid traveling down the longer pathway is in contact with the person's skin **80** for a longer period of time. Thus, tighter spirals lead to increased contact time between the fluid and the skin **80**. These longer contact times can increase the effectiveness of the fluid because the skin can absorb an adequate amount of active ingredients of the treatment material. Fluid retention time on the patient's skin can be increased to increase hydration, serum retention, and the like. Shorter pathways can be used to reduce contact time between the fluid and the patient's skin. In some embodiments, for example, the tip **34** of FIGS. **5A** to **5D** has a relatively short pathway to limit absorption of fluids, achieve relatively high flow rates, and the like.

Additionally, the inner members **124** can be configured to remove tissue. The inner member **124** can be an abrasive member designed to remove tissue when the inner member **124** slides along a person's skin. The user may select a tip **34** based on the appropriate detention time and abrasiveness for the treatment being applied. For example, the tip **34** illustrated in FIG. **7** will provide less abrasion than the tip illustrated in FIG. **6**, but the tip **34** illustrated in FIG. **7** will provide a longer detention time than the tip **34** illustrated in FIG. **5**.

The illustrated tip **34** includes a generally continuous inner member **124** that extends from near the through-hole **122** towards at least one of the through-holes **114**. In other embodiments, the tip **34** can have a plurality of inner members **124**. For example, the inner members **124** can be linear, curved, and may be continuous or discontinuous.

The handpiece assembly **18** can be moved while the spiral-like inner member **124** engages the patient's skin. The movement of the handpiece assembly **18** can increase the effectiveness of the treatment material expelled out of the tip **34**. In some embodiments, for example, the tip **34** can be used with a lifting treatment material that facilitates extractions of, for example, sebum, blackheads, skin, or other substances (e.g., oils, dead skin, etc.). The lifting treatment extraction producer can unclog pores to improve the treated skin's overall appearance. To facilitate extractions, the handpiece assembly **18** can be twisted or rotated while the tip **34** is pressed against the patient's skin. The twisting action and the lifting treatment material can work in combination for effective extractions. In alternative embodiments, a handpiece assembly **18** can also be used without a lifting treatment material for extractions by employing the twisting motion.

In certain embodiments, the spiral-like tip **34** massages the skin **80**. In other embodiments, the spiral-like tip **34** ablates the skin **80**. For example, the inner members **124** may act as blades to cut thin layers from the skin **80** when the user twists the handpiece assembly **18**. Twisting the handpiece assembly **18** causes the tip **34** to rotate about the twisting axis, rotating the sharp inner members **124** against the skin **80**, which causes ablation. Thin layers of skin can thus be removed by the handpiece assembly **18**. Additionally or alternatively, the spiral-like tip **34** may plane along skin when a fluid is applied to the skin. The planing tip **34** can remove a thin layer of the skin (e.g., the stratum corneum, preferably hydrated stratum corneum). Accordingly, the user can use the handpiece assembly **18** to remove a particular amount of skin.

A vacuum can be applied by the handpiece assembly **18**. For example, the console **12** can have a pump that applies a vacuum via the output line **52**. The negative pressure draws waste material into the through-holes **114** and out of the handpiece assembly **18**. When the tip **34** engages the patient's skin, the vacuum can draw the skin against the tip **34** to enhance the effectiveness of the inner members **124**. The vacuum can be increased or decreased to increase or decrease, respectively, for example, frictional forces, depth of cutting, amount of abrasion, and the like. To rapidly remove skin, a strong vacuum can be applied to the person's skin so that the skin is pulled against the inner member **124**. The vacuum can also facilitate removal of the waste fluid captured between the tip **34** and the patient's skin. A vacuum can also be used in combination with the tips illustrated in FIGS. 1-10E. The vacuum can also be varied based on the thickness, compliance, and other properties of the skin surface.

The tip **34** can have any suitable number of through-holes **114**, **122** to achieve the desired fluid flow between the skin **80** and the tip **34**. For example, FIG. 5A to 5D illustrate an embodiment with two through-holes **114**. The number of through-holes **114**, **122** can be chosen based on the cross-sectional areas of the through-holes **114**, **122** and the expected flow rate of the fluid through the channel **100**. Preferably, one end of through-holes **114** is positioned between the inner member **124** and the outer member **120**. In some embodiments, including the embodiments illustrated in FIGS. 5A through 7, the through-holes **114** are positioned generally midway between the outer member **120** and inner member **124**.

The tips can also have one or more energy sources for delivering energy to the skin. Radiant energy, heat, and the like can be delivered to the skin by the tips. The tip **34** illustrated in FIGS. 6A to 6D has a pair of energy sources **151** in the form of LEDs. When the tip **34** is proximate the patient's skin, the LEDs **151** can deliver a desired amount of energy to the skin. The illustrated tip **34** has four LEDs; however, any number of LEDs can be employed.

In alternative embodiments, the tips can carry deployable material. The structure **151** can be in the form of a cavity or pocket that contain and carry material that is released when it engages the treatment fluid. The material in the cavities **151** can be made of any of the treatment materials disclosed herein, and can be in a solid form. For example, the cavities can hold lubricant or soap that is released when the tip is applied to skin.

FIGS. 8A through 8D illustrate another embodiment of a tip **34** when the inner member **124** includes a ring with perforations **140** that provide fluid communication between the through-hole **122** and through-holes **114**. A space **100** can be defined between the inner member **124**, perforations **140**, and outer member **120** when the tip **34** is in operative engagement with the skin **80**. FIG. 8C illustrates an embodiment with eight through-holes **114**. In the embodiment illustrated in FIGS. 8A through 8D, the inner member **124** forms recessed regions **171**, allowing for a larger area of fluid contact with the skin **80** than the tips **34** illustrated in FIGS. 5 through 7.

FIGS. 9A through 9D illustrate another embodiment of a tip **34** comprising an outer member **120** and an array of protruding inner members **124**. A recessed region **191** is defined between the inner members **124** and the outer member **120**. The inner members **124** of FIGS. 9A to 9D can be posts that are similar to the inner members described above. The post **124**, for example, can have relatively sharp edges. These edges can be used to remove skin. In some embodiments, the inner members **124** can have relatively sharp planing blades. The tip **34** illustrated in FIGS. 9A through 9D allows for more freedom of movement of the treatment fluid. The protruding inner members **124** preferably abrade the skin differently than the tips **34** illustrated in FIGS. 5A through 8. Rather than being able to ablate large sections of the skin **80** like a blade, as the tips **34** in FIGS. 5A-8 can do in certain embodiments, the plurality of protruding inner members **124** can ablate or roughen a plurality of smaller sections of the skin **80**.

The protruding member **124** can optionally contain treatment material. For example, the protruding members **124** can be generally cylindrical members having a passageway or chamber **127** that holds treatment material. Thus, fluid can be used in combination with treatment material coupled to the tip **34**.

With reference to FIGS. 5A through 9, the inner member **124** preferably has a height from the distal surface that is generally less than the height of the outer member **120**. In some non-limiting embodiments, the height of the inner member **124** is less than 90%, 70%, 60%, 50%, and ranges encompassing such percentages of the height of the outer member **120**. However, in other embodiments, the inner member **124** has a height that is generally greater than the height of the outer member **120**. For example, the inner member **124** can have a height that is 10%, 20%, 30%, 40%, 50% greater than the height of the outer member **120**. The inner member **124** can thus protrude from the tip **34**. A skilled artisan can select a desired height of the inner member **124** and/or the outer member **120** to achieve the desired interaction with the person's skin **80**.

FIGS. 10A through 10E illustrate another embodiment of a tip **34** comprising an outer member **120** and a pad **128**. FIG. 10E depicts the pad **128** removed from the tip **34**. The tip **34** preferably has a mounting surface **227** that is surrounded by the outer member **120**. The pad **128** can be permanently or temporarily coupled to the mounting surface **227**.

The pad **128** preferably has a distal surface **224** configured to treat a person's skin. In some embodiments, the pad **128** is a disposable pad that comprises treatment material attached thereto. For example, the pad **128** may comprise vitamins, moisturizers, antioxidants, and the like. Preferably, the pad **128** comprises an adhesive proximal side and a distal side **224** including an abrasive surface. The abrasive surface can have grit, a plurality of members (e.g., members similar to the inner members **124** described above), or the like. The pad **128** can be permanently coupled to the mating surface **227** so that the tip **34** can be used for an extended length of time, or for multiple treatments. In alternative embodiments, the tip **34** is removable for maximum flexibility in selecting pad abrasiveness, and also allows the user to make changes to the tip **34** without changing the tip **34** in its entirety. The grit rating of abrasive surface of the distal surface **224** can be selected based on the desired rate of skin removal.

The illustrated pad **128** is generally elliptical and planar. In alternative embodiments, the pad **128** can be polygonal, circular, or have any other shape as desired. The pad **128** can have cutouts **225** that can match the through-holes **114**, **122**. The cutouts **225** can be aligned with the through-holes **114**, **122** when the pad **128** is coupled to the mounting surface **227** of the tip **34**, as shown in FIGS. 10A to 10D. The illustrated mounting surface **227** defines a plurality of tip flow channels **229** extending between the through-holes **114**, **122**. When the tip **34** is assembled, fluid can flow along the channels **229** between the main body **66** and the pad **128**.

Various types of adhesives can be used to temporarily or permanently couple the pad **128** to the mounting surface **227**. As used herein, the term "adhesive" is a broad term and includes, but is not limited to, coupling agents, glues, bonding materials, or the like. In some embodiments, for example, waterproof pressure sensitive adhesives are used for releasably coupling the pad **128** to the mounting surface **227**. In some embodiments, the pad **128** can be permanently coupled to the mounting

surface 227. For example, the pad 128 can be bonded or fused to the main body 66. Additionally or alternatively, snap fittings, fasteners, or other coupling structures can be used to mount the pad 128.

The tip 34 described above can be used for wet or dry modes of operation. As such, the tip 34 can be used for wet exfoliation or dry exfoliation. In some embodiments, the tip 34 is used in a dry mode to remove a desired amount of skin. After removing a desired amount of skin, the tip 34 can be used in a wet mode on the same or different area of the patient's skin. During wet mode, fluid can be passed out of the tip 34 onto the patient's skin. The wet tip 34 can exfoliate, hydrate, and/or perform other types of treatments. Alternatively, the tip 34 can be used in a wet mode and then a dry mode. The sequence of wet and dry modes of operation can be selected based on the type of tip, treatment material, skin condition, and the like.

Although the handpiece assemblies are primarily discussed with respect to use with treatment material, the handpiece assemblies can be used without treatment material, i.e., the handpieces can be used in a dry procedure. Dry procedures can be used for non-hydration procedures and may require less post-procedure clean up.

Various fabrication techniques can be employed to make the tips 34 as mentioned above in connection with FIGS. 11A-11E. In some embodiments, the tips 34 are formed through a molding process, such as an injection or compression molding process. The tips 34 of FIGS. 5A to 5D, for example, can be monolithically formed through an injection molding process. Alternatively, the tip 34 can have a multi-piece construction, if desired. The tips 34 can be made of polymers, rubbers, metals, or other suitable materials.

The tips 34 can also be fabricated in a multi-step process. For example, the main body 66 and skirt 64 can be formed in a single process. A textured surface (e.g., pad, inner members 124, etc.) can be applied to the main body 66 in a subsequent process. The textured surface can be formed by cutting, embossing, adding material (e.g., a pad, adhesive grit, etc.), a roughening implement, stamping process, or other suitable texturing means.

The tips can have associated treatment materials, including, for example, a medicament. As used herein, the term "medicament" is a broad term and includes, without limitation, growth agents, growth factors or hormones, growth inhibitors, serums, treatment material, cleaners, vitamins, exfoliators, lubricants, or other substances that can be used to treat a patient's skin. The medicament can be associated with the tip 34 by imbedding, overlaying, coating, impregnation, co-mixing, absorption, or other suitable means for associating the medicament with the tip 34. The medicament can be hardened so that it can further enhance massaging and/or abrasion. In some embodiments, the medicament forms hardened grit that can be imbedded on the surface of the tip 34. The grit can work in combination with the inner members 124 to treat a person's skin. If a fluid is used, the fluid can facilitate the release of the medicament from the tip 34. In some embodiments, the medicament comprises or more bioactive substances, such as antibiotics, substances for accelerating the healing of the wound, cell proliferation agents, and the like. Such bioactive substances may be desirable because they contribute to the healing of damaged or removed skin, as well as reducing the likelihood of infection.

FIGS. 11A to 11E illustrate different cross-sections of inner members that can be used with the tips illustrated in FIGS. 1-10E. The inner member 124 of FIG. 11A has generally sharp tip 253 for removing tissue. The tip 253 can have any suitable configuration for removing tissue from a patient. FIG. 11B illustrates an inner member 124 that has a pair of cutting edges 253 and a generally trapezoidal shape. FIG. 11C illustrates an inner member 124 that has a surface treatment 255 for treating a person's skin. The surface treatment 255 can be serrations, grooves, grit, roughed surface, protrusions, and the like. The type of surface treatment 255 can be selected based on the procedure to be performed. FIG. 11D illustrates another inner member 124 having a pair of cutting edges 253. The cutting edges 253 are spaced from each other and protrude outwardly. The central portion 257 is generally V-shaped; however, the central portion 257 can have other configurations. For example, FIG. 11E illustrates a central portion 257 that has a curved, semi-circular profile. In alternative embodiments, the inner member 124 can have more than two cutting edges.

The inner members 124 of FIGS. 11A to 11E can be formed by a molding process, such as an injection molding process. Additionally or alternatively, the inner members 124 can be formed by a machining process. For example, at least a portion of the inner member 124 of FIGS. 11D to 11E can be formed through a machining process. In some embodiments, the central portion 257 can be formed by cutting material out of the inner member 124. The fabrication process (e.g., molding, injection molding, compression molding, machining, milling, etc.) can be selected based on the design of the inner members.

Referring again to FIG. 1, the console 12 includes a manifold system 24 that holds containers 26 containing treatment fluids and/or antimicrobial agents. In a preferred embodiment, the console 12 holds four containers 26, three containing different treatment fluids and one containing an antimicrobial agent. In the illustrated embodiment, the largest container 26 holds antimicrobial agent for cleaning and sanitizing the fluid lines of the console 12. The containers 26 can also hold other suitable substances, such as surfactants, disinfectants, sanitizers, and the like, for cleaning and/or sanitizing the skin treatment system 10.

As shown in FIGS. 12 and 13A, the container 26 can be a fluid source such as a bottle comprising a body 262, a neck 264, and a closure assembly 266. The neck 264 includes a threaded neck finish and the closure 266 includes a threaded interior surface, allowing it to screw onto the neck 264. The closure 266 can be permanently or temporarily coupled to the neck 264. The illustrated bottle 26 is a non-refillable, disposable bottle. As used herein, the term "non-refillable" is a broad term that includes, but is not limited to, components that cannot be easily refilled with a treatment material. For example, the illustrated non-refillable bottle 26 cannot be refilled without substantial difficulty.

Bodies 262 of the containers 26 may be formed by stretch blow molding a preform into the desired shape. In other embodiments, the body 262 and a neck 264 can be formed by extrusion blow molding. For example, the bottle of FIG. 13A can be formed by extrusion blow molding. The containers 26 can be made of polymers, thermosets, thermoplastic materials such as polyesters (e.g., polyethylene terephthalate (PET)), polyolefins, including polypropylene and polyethylene, polycarbonate, polyamides including nylons, epoxies, and/or acrylics. The material can be virgin or post-consumer/recycled. However, other suitable materials known in the art can also be used.

In some embodiments, including the illustrated embodiment of FIGS. 12 and 13B, the closure 266 is welded (e.g., induction welded) to an upper edge 269 of the neck 264. A sealing member 267 can be interposed between the upper edge of the neck 269 and the closure 266. In some embodiments, the sealing member 267 is made out of a conductive metal, such as aluminum, that preferably does not react with the fluid in the bottle 26. In other embodiments, the seal 267 comprises plastic, such as cellophane, polypropylene, or other suitable material, preferably suitable for coupling to the closure 266 and upper edge 269. In some embodiments, the sealing member 267 comprises metal that is at least partially coated with a polymer, such as polypropylene. Induction welding can be used to couple the polypropylene to the closure 266 and neck 264, both of which can also comprise polypropylene.

FIG. 14A illustrates another embodiment of a bottle 26. The closure 266 includes locking members 268 that engage the neck 264, but do not allow removal of the closure 266 from the bottle 26 when assembled, as shown in FIG. 13B. The locking closure 266 may include a sealing member 267, for example as described above.

In either of the embodiments illustrated in FIGS. 12 through 14B, the closure 266 may then be sealed with a second closure (not shown), creating multi-piece closures. For example, a screw cap can be threaded onto the external threads 273 at the top end of the closure 266. In these embodiments, the treatment fluid inside the bottle 26 may be accessed by puncturing or otherwise breaking the seal 267, for example with an insertion tip assembly 59 (see FIG. 13A).

The insertion tip assembly 59 has an elongate member 161 that comprises a fluid pick up conduit 62 and lancing tip 64 extending from the distal end of the conduit 62. In the illustrated embodiment, the lancing tip 64 is a tubular member having a somewhat sharp distal end. To access treatment fluid in the bottle 26, the lancing tip 64 can be inserted into the closure passageway 73 of the closure 266. The lancing tip 64 can be advanced through the passageway 73 until it breaks the sealing member

267. The elongate member 161 can be sufficiently rigid such that it can break the sealing member 267 without buckling. The elongate member 161 can comprise metal, polymers, plastics, or any suitable material.

The fluid pick up conduit 62 and lancing tip 64 can be slid through the passageway 73 until the stop 91 is spaced from the upper edge of the closure 266. In alternative embodiments, the insertion tip assembly 59 can be slid through the passageway 73 until the stop 91 contacts the upper edge of the closure 266, as shown in FIG. 13B. After the insertion tip assembly 59 and bottle 26 are assembled, as shown in FIG. 13B, the treatment material can be draw upwardly through the lancing tip 64 and the fluid pick up conduit 62. The treatment material can flow through a passageway of the insertion tip assembly 59 and to the manifold assembly 24.

In certain embodiments, the treatment fluid applied from the containers 26 may be selected from the console 12 for a particular treatment or skin type. In one embodiment, the treatment fluid may comprise a skin rejuvenation serum. Skin rejuvenation serum cleans the skin 80 deeply while softening sebum and impurities to aid in extractions. Skin rejuvenation serum also assists in dislodging dead cells for extraction and exfoliation by the tip 34 as well as providing residual hydration that aids in firming and smoothing fine lines, resulting in clean, refined, and ultra-moisturized skin 80. Preferably, a skin rejuvenation treatment serum is active-4™, available from Edge Systems Corp., 2277 Redondo Ave., Signal Hill, CA, 90755, (800) 603-4996. In another embodiment, the treatment fluid may comprise a salicylic acid serum. A salicylic acid serum cleans oily skin deeply while softening sebum and impurities to aid in extraction and exfoliation by the tip 34. Hydration additives in the salicylic acid serum create an ultra-moisturized skin surface, and is blended to remain on the face for the best possible benefit. Preferably, a salicylic acid treatment fluid is Beta-hd™, also available from Edge Systems Corp. In yet another embodiment, the treatment fluid may comprise antioxidants. The antioxidant serum is a hybrid that combats free radicals and environmental damage to the cells. The antioxidant serum is formulated with a blend of the most effective antioxidant ingredients. The antioxidant serum is an absorbable, leave-on service that improves the appearance of age signs as well as texture and clarity. Preferably, an antioxidant treatment fluid is antiox-6™ also available from Edge Systems Corp. The treatment fluids may comprise agents known to be beneficial to skin healing and/or hydration including but not limited to glucosamine, laminaria digitata extract, yeast extract, carbamide, lactic acid, sodium lactate, honey extract, pentylene glycol, spirea ulmaria extract, *Camellia sinensis* leaf (white tea) extract, horse chestnut extract, stabilized vitamins A, B1, B6, B12, C, and E, tocopherol, inositol, calcium panthothenate, linoleic acid, rosemarinus officinalis extract, biotin, and aloins such as anthraquinone glycosides, polysaccharides, sterols, gelonins, and chromones.

A single treatment may comprise the serial use of several treatment fluids from the containers 26. For example, the treatment of acne prone skin may comprise salicylic treatment followed by antioxidant treatment, the treatment of aging skin may comprise skin rejuvenator treatment followed by salicylic treatment followed by antioxidant treatment, the treatment of congestion (e.g., blackheads) may comprise skin rejuvenator treatment followed by salicylic treatment followed by antioxidant treatment, the treatment of damaged skin (e.g., due to medication or smoking) may comprise skin rejuvenator treatment followed by antioxidant treatment, the treatment of skin may comprise skin rejuvenator treatment followed by salicylic treatment followed by antioxidant treatment, the treatment of hyperpigmentation may comprise skin rejuvenator treatment followed by salicylic treatment followed by antioxidant treatment, the treatment of melasma may comprise skin rejuvenator treatment followed by salicylic treatment followed by antioxidant treatment, the treatment of sensitive skin may comprise skin rejuvenator treatment followed by antioxidant treatment, and the treatment of thin skin may comprise salicylic treatment followed by antioxidant treatment. Alternatively, a single treatment may comprise the parallel use of a combination of treatment fluids from the containers 26, for example using a handpiece with a plurality of input lumens 90 as described above. Treatment time with each treatment fluid is preferably about 2 to 20 minutes, but may be longer or shorter depending on the patient, the tip 34 used, and the treatment itself.

The treatment materials can be used for acne (e.g., by removing oils, bacteria, etc.), melasma, damaged skin (e.g., sun damaged skin, burns, free radical damage, etc.), extractions, skin lightening and/or brightening, skin lines (e.g., fine lines, wrinkles, creases, etc.), dry skin, and the like. The treatment materials can improve skin elasticity and overall health of the skin. For example, if the skin is damaged, antioxidants can be applied to damaged area. Accordingly, the skin treatment system 10 can be used to improve the health, appearance, and/or function of a person's skin.

Additionally, the line 20 may be periodically flushed with a fluid (e.g., a antimicrobial fluid, water, etc.) contained in one of the containers 26. Antimicrobial fluids can contain any disinfecting agent compatible with skin including, but not limited to, butylene glycol, phenoxyethanol, and methyl isothiazolinone. Preferably, an antimicrobial fluid is Rinseaway™, available from Edge Systems Corp. The line 20 should be flushed with antimicrobial fluid at least at the end of each service day. Flushing with antimicrobial fluid is more important when the system is not used for consecutive days.

As illustrated in FIG. 1, the console 12 comprises the manifold system 24 designed to draw treatment fluid from at least one of the containers 26 based on user selection. The manifold system 24 may include switches 29, each corresponding to one of the bottles. The switches 29 can be used to control fluid flow from the containers 26. The illustrated switches 29 can be used to turn Off/On to permit or prevent fluid flow from the bottles 26. The illustrated manifold system 24 has a switch corresponding to each bottle 26. As such, the switches can be used to independently control fluid flow from each of the bottles 26. In other embodiments, a single switch can be used to control the flow of treatment fluid from more than one of the bottles 26.

With continued reference to FIG. 1, the button 246 can be operated to release a corresponding bottle 26 from the manifold system 24. FIG. 15A is front perspective view an embodiment in which the manifold system 24 contains quick-release locks connected to the button 246, wherein the quick-release locks capture the containers 26. As illustrated in FIGS. 14B and 14C, the quick-release locks 242 engage the closure 266 when the bottle 26 is inserted into the manifold system 24. When the quick-release lock 242 is manually engaged by a user, for example by pulling the button 246, a slide structure 249 surrounding the closure 266 releases, thereby releasing the bottle 26 from the manifold system 24.

FIG. 15E illustrates the slide structure 249 holding the neck 264 of the bottle 26 in an elongated slot 309. The button 246 can be pushed inwardly (indicated by the arrow 313) so that the neck 264 is positioned within the enlarged aperture 317. The bottle 26 can then slide downwardly out of the manifold system 24. The bottle 26 can be replaced with another bottle 26.

To couple the bottle 26 to the manifold system 24, the closure 266 can be inserted through the aperture 317 of the slide structure 249 when the button 246 is pushed in. Once the closure 266 engages the stop surface 333 (FIG. 15C), the spring 247 can push the slide structure 249 until the flange 335 of the bottle 26 rests on the slide structure 249, as shown in FIG. 15C. In such a position, the manifold system 24 securely holds the bottle 26. The illustrated slide structure 249 has a sloped portion 269 that can cam along the flange 335 as the button 246 moves outwardly. Accordingly, the slide member 249 can push the closure 266 upwardly until the closure 266 is locked with the manifold 24, as shown in FIG. 15C. The quick-release lock 242 is loaded with spring 247 such that the slide structure 249 is biased towards the button 246.

The manifold system 24 can have a modular design so that it can be removed from the console 12. In some embodiments, the manifold system 24 and associated containers 26 can be removed and transported away from the console 12. Accordingly, the modular manifold systems can be interchanged to provide treatment flexibility. Alternatively, the manifold system 24 can be permanently mounted to the console 12.

FIGS. 15B and 15C illustrate cross-sectional views of the manifold system 24 taken along lines 15B-15B and lines 15C-15C, respectively. Both FIGS. 15B and 15C show the fluid pick up conduit 62 in operative engagement with the bottle 26 through the seal 267. Suction device(s) is preferably in fluid communication with the fluid pick up conduit 62, and draws fluid out of the bottle 26 through the fluid pick up conduit 62. The fluid can flow through a passageway 161 (see FIG. 15C) extending through the pick up conduit 62. The fluid can flow to and through the lumen 171 towards the line 20. If the switch 29 is off, the fluid from one or more of the upstream bottles can flow along the passage 173. The manifold system 24 then directs the fluid into the line 20.

In certain embodiments, including the embodiment of FIG. 1, the console 12 comprises a computer with display 32. In one embodiment, the display 32 is a user input device comprising a touch screen that controls the computer. In other embodiments, the computer may be controlled by input devices such as a keyboard, keypad, mouse, pointing device, or other input device. The computer controls a variety of functions in the console 12. For example, the computer may control the manifold system 24, and thereby the flow of treatment fluids from the containers 26. In one embodiment, the fluid flowing through the line 20 can be changed by pressing a single button on the touch screen display 32. In another embodiment, the computer contains teaching tutorials that are exhibited on the display 32. In yet another embodiment, the user may change program chips within the computer according to treatment and/or patient. In still another embodiment, the computer records patient and treatment data, for example data gathered during treatment.

The console 12 can also comprise a mechanical system for controlling fluid flow from the containers to the handpiece. One or more pumps, valves, fluid lines, and the like can cooperate to deliver fluid from the containers to the handpiece. The console 12 can be powered pneumatically, electrically, or by any other suitable powering means. The mechanically drive console 12 can have manual controls for controlling fluid flow to the handpiece.

The console 12 can also comprise additional handpieces suitable for other types of skin treatment. These additional handpieces can be used for pre-treatment or post-treatment in combination with other modalities. For example, the console 12 may include a handpiece for diamond tip abrasion, or "crystal-free" microdermabrasion, as described above. Such a handpiece may be useful for more aggressive treatments, in addition to treatment with the handpiece assembly 18. The diamond tips can range from fine to extra coarse.

In some embodiments, the console 12 comprises a handpiece including at least one light emitting diode (LED). Light therapy has been shown to improve skin. For example, red light between about 600 and about 700 nanometers and infrared LED light between about 700 and about 1,000 nanometers reduces the appearance of fine lines and superficial hyperpigmentation. For another example, blue LED light at about 430 nanometers improves the appearance of oily and acne-prone skin. Other benefits of light therapy include promotion of collagen production, increased circulation and moisture retention, smoothing of skin texture, and improvement of skin firmness and resilience.

The console 12 can comprise handpieces for vacuum therapy such as lymphatic drainage and cellulite massage. Vacuum therapy enhances the effects of treatment with the handpiece assembly 18 and LED light therapy. Preferably, the vacuum therapy handpieces are sized appropriately for facial massage and body massage. An example of a multi-modality protocol using a plurality of handpieces comprises diamond tip abrasion, treatment with handpiece assembly 18 and at least one treatment fluid from containers 26, vacuum therapy, red light therapy, and application of sunscreen, for example at a minimum skin protection factor (SPF) of 15. The various modalities may be included and ordered by the user depending on the desired outcome of the overall treatment.

The console 12 optionally includes any of a plurality of additional features. For example, a digital camera may be used to take pictures of the patient before and after treatment, and the pictures may be stored on the computer. The computer may hold client medical and treatment records. The computer may be connected to a network. The console 12 may store disks. The console 12 may include an ultrasound unit. The console 12 may include a stimulator, such as an electrical stimulator. The console 12 may include an iontophoresis handpiece. The number of additional features is limitless when considering the range of features that a user may wish to incorporate with the treatment provided by the handpiece assembly 18.

FIG. 16 depicts another embodiment of the skin treatment system 10, which may be generally similar to the embodiment illustrated in FIG. 1, except as further detailed below. Where possible, similar elements are identified with identical reference numerals in the depiction of the embodiment of FIG. 1.

The line 20 includes an output line 50 for removing waste from the handpiece assembly 18 and an input line 52 for delivering treatment material to the handpiece assembly 18. A valve 300 can be disposed along the input line 52 to inhibit backflow of treatment material. The console 12 can pump treatment material through the input line 52 to the handpiece assembly 18 when the handpiece assembly 18 is applied to the person's skin, as detailed above. The fluid flow through the input line 52 can be reduced or stopped so that the handpiece assembly 18 can be removed from the patient's skin. The valve 300 can inhibit the flow of fluid through the input line 52 towards the console 12. A desired amount of treatment material can therefore be contained in the handpiece assembly 18 and the section 310 of the input tubing 52 extending between the valve 300 and the handpiece assembly 18. When the handpiece assembly 18 is applied to a patient's skin, a vacuum can be applied to the output line 50. The vacuum can draw the treatment material out of the handpiece assembly 18 without a substantial or noticeable delay.

In some embodiments, the valve 300 can be a one-way valve, such as a duckbill valve, check valve, or other type of valve for inhibiting fluid flow. In alternative embodiments, the valve 300 can comprise a plurality of valves (e.g., one-way valves, flow regulators, adjustable valves, etc.).

FIG. 17 is a cross-sectional view of the line 20. The input and output lines 50, 52 can have different or similar cross sectional flow areas. The illustrated output line 50 has a passageway 312 with a diameter that is less than the diameter of a passageway 314 of the input line 52. Accordingly, a relatively large slug of treatment material can be stored in the section 310 extending distally from the valve 300 to the handpiece assembly 18. The slug can be quickly delivered out of the handpiece assembly 18 once the handpiece assembly is applied to a patient's skin as detailed above.

In some embodiments, the section 310 of the output line 50 has a length L greater than 6 inches, 12 inches, 18 inches, 24 inches, and ranges encompassing such lengths. In some embodiments, the section 310 of the output line 50 has a length L greater than 24 inches, 30 inches, 36 inches, and ranges encompassing such lengths. The passageway 312 can have a cross-sectional area that is at least 10%, 30%, 50%, 75%, or 100% greater than the cross-sectional area of the passageway 314. The length L and the diameters of the passageways 312, 314 can be selected based on the desired amount of treatment material to be stored in the line 20, delivery and removal rates.

FIGS. 18 and 19 illustrate a modular handpiece assembly 360 having a cartridge 362 containing treatment material. The illustrated handpiece assembly 360 can be used to deliver treatment material from the cartridge 362. The main body 30 can have a pump for pressuring the treatment material. In one embodiment, the fluid control device includes a power supply, such as a battery, which provides power to electrical components (e.g., pumps or valves) of the handpiece assembly 360. The power supply can be a battery that is preferably disposed within the main body 30 of the handpiece assembly 360. In one arrangement, the battery is a rechargeable battery that can be connected to and recharged by an AC power supply, such as a typical residential electrical outlet. Alternatively, the handpiece assembly 360 can be directly powered by an AC power supply. The power supply can provide power to several components of the handpiece assembly 360. For example, the power supply can provide power to a plurality of fluid control devices 330 and/or a flow control unit. A control switch 371 can be used to turn the handpiece assembly 360 Off/On and/or control the output of the handpiece assembly 360.

In operation, the cartridge 362 can be inserted into the main body 30. The handpiece assembly 360 can be applied to a patient's skin to deliver treatment material from the cartridge 362 to the patient's skin. After delivering a desired amount of treatment material, the cartridge 362 can be separated from the main body 30. The cartridge 362 can be a one-use or multi-use cartridge. For example, the cartridge can be a non-refillable disposable cartridge.

The tip 34 can also be used to remove hair or perform other skin treatments. For example, the tip 34 can include one or more razor blades and may be configured to apply a treatment material (e.g., antioxidants, vitamins, serums, growth agents, etc.) to the skin during the shaving process. In such embodiments, the main body 30 can be an elongated handle that is connected to a transversely extending elongate tip 34. In some embodiments, the handpiece assembly can be in the form of a disposable handheld razor. The treatment material can reduce or substantially eliminate problems associated with wet or dry shaving systems. These treatment materials may be applied prior to, during, before, and/or after shaving.

The articles disclosed herein may be formed through any suitable means. The various methods and techniques described above provide a number of ways to carry out the invention. Of course, it is to be understood that not necessarily all objectives or advantages described may be achieved in accordance with any particular embodiment described herein. Thus, for example, those skilled in the art will recognize that the methods may be performed in a manner that achieves or optimizes one advantage or group of advantages as taught herein without necessarily achieving other objectives or advantages as may be taught or suggested herein.

Furthermore, the skilled artisan will recognize the interchangeability of various features from different embodiments disclosed herein. Similarly, the various features and steps discussed above, as well as other known equivalents for each such feature or step, can be mixed and matched by one of ordinary skill in this art to perform methods in accordance with principles described herein. Additionally, the methods which are described and illustrated herein are not limited to the exact sequence of acts described, nor are they necessarily limited to the practice of all of the acts set forth. Other sequences of events or acts, or less than all of the events, or simultaneous occurrence of the events, may be utilized in practicing the embodiments of the invention.

Although the invention has been disclosed in the context of certain embodiments and examples, it will be understood by those skilled in the art that the invention extends beyond the specifically disclosed embodiments to other alternative embodiments and/or uses and obvious modifications and equivalents thereof. Accordingly, it is not intended that the invention be limited, except as by the appended claims.

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US5171215A	1991-08-22	1992-12-15	Flanagan Dennis F	Endermic method and apparatus
JPH0542060A	1991-08-12	1993-02-23	Akinori Hara	Suction type esthetic apparatus
US5192269A	1991-07-24	1993-03-09	Abbott Laboratories	Multi-valve manifold for drug infusion systems
JPH0588552A	1991-09-27	1993-04-09	Yokogawa Hewlett Packard Ltd	Method for detecting remaining ink on printer
US5207234A	1988-01-11	1993-05-04	L.I.C.A. Di Rosso & C.S. N.C.	Method for making micro-abrasions on human tissue
DE4237940A1	1991-11-11	1993-05-19	Josef Berens	Body cleaning appliance with hand-operated head and handle - has central hole in washer head, suction holes surrounding it, and annular washer piece

US5217455A	1991-08-12	1993-06-08	Tan Oon T	Laser treatment method for removing pigmentations, lesions, and abnormalities from the skin of a living human
US5222956A	1992-07-06	1993-06-29	Altair Instruments, Inc.	Surgical drill collet mechanism and bur
US5242433A	1992-12-07	1993-09-07	Creative Products Resource Associates, Ltd.	Packaging system with in-tandem applicator pads for topical drug delivery
EP0564392A2	1992-03-04	1993-10-06	D. Antonio Fructuoso Martinez	Medical equipment, useful in the cutaneous dermabrasion technique, achieved by means of abrasive powder
US5254109A	1992-12-07	1993-10-19	Creative Products Resource Associates, Ltd.	Separately packaged applicator pads for topical delivery of incompatible drugs
W01994024980A1	1993-04-30	1994-11-10	D+P Cosmetics Ag	Massage device
US5368581A	1992-12-07	1994-11-29	Creative Products Resource Associates, Ltd.	Method of using a packaging system with folded applicator pads for topical drug delivery
US5387215A	1992-02-12	1995-02-07	Sierra Surgical Inc.	Surgical instrument for cutting hard tissue and method of use
US5391151A	1991-01-15	1995-02-21	Survival Technology, Inc.	Subcutaneous injector
FR2712172A1	1993-11-09	1995-05-19	Rabier Nicolas	Skin exfoliation device with open circuit
US5419772A	1993-09-29	1995-05-30	Teitz; Bernard R.	Surgical irrigation apparatus for cleaning and sterilizing wounds and surgical areas during surgery
US5423803A	1991-10-29	1995-06-13	Thermotrex Corporation	Skin surface peeling process using laser
US5437372A	1993-08-17	1995-08-01	Per-Lee; Myra S.	Applicator device
US5441490A	1991-01-09	1995-08-15	Principal Ab	Transdermal perfusion of fluids
US5460620A	1992-07-31	1995-10-24	Creative Products Resource, Inc.	Method of applying in-tandem applicator pads for transdermal delivery of a therapeutic agent
AT400305B	1994-03-07	1995-12-27	Divida Ges M B H Methoden Und	Instrument for the treatment of skin zones
US5484427A	1991-01-18	1996-01-16	Gibbons; Delmar	Body vacuum
US5490736A	1994-09-08	1996-02-13	Habley Medical Technology Corporation	Stylus applicator for a rehydrated multi-constituent medication
US5512044A	1994-10-11	1996-04-30	Duer; Edward Y.	Embolic cutting catheter
US5562643A	1992-12-28	1996-10-08	Johnson; James B.	Device and treatment for treatment of skin
W01997000707A1	1995-06-23	1997-01-09	Chattanooga Group, Inc.	Physical therapy apparatus having an interactive interface, and method of configuring same
US5612797A	1994-05-14	1997-03-18	U.S. Philips Corporation	Liquid crystal projection display systems
US5611687A	1995-11-06	1997-03-18	Dental Concepts Inc.	Oral hygiene delivery system
W01997011650A1	1995-09-25	1997-04-03	Richard William Cawley	Apparatus and method for microdermoabrasion
US5618275A	1995-10-27	1997-04-08	Sonex International Corporation	Ultrasonic method and apparatus for cosmetic and dermatological applications
US5626631A	1992-10-20	1997-05-06	Esc Medical Systems Ltd.	Method and apparatus for therapeutic electromagnetic treatment
GB2306351A	1995-06-07	1997-05-07	Akihiro Inahara	Shower head with suction cleaner
US5658323A	1995-07-12	1997-08-19	Miller; Iain D.	Method and apparatus for dermatology treatment
US5658583A	1995-07-28	1997-08-19	Zhang; Jie	Apparatus and methods for improved noninvasive dermal administration of pharmaceuticals
US5674235A	1995-05-10	1997-10-07	Ultralase Technologies International	Ultrasonic surgical cutting instrument
US5676648A	1996-05-08	1997-10-14	The Aps Organization, Llp	Iontophoretic drug delivery apparatus and method for use
US5676643A	1995-02-13	1997-10-14	The Procter & Gamble Company	Dispenser for friably releasing dry particulate medicaments
US5683971A	1993-03-18	1997-11-04	Dymon, Inc.	Abrasive hand cleaning article incorporating waterless hand cleanser
JPH09294747A	1996-05-01	1997-11-18	Fukutaro Yamazaki	Athlete's foot treating implement
US5697920A	1991-01-18	1997-12-16	Gibbons; De Lamar	Body vacuum

US5707383A	1995-10-05	1998-01-13	Xomed Surgical Products, Inc.	Method of removing soft tissue in the middle ear
US5713785A	1997-01-17	1998-02-03	Linax Co., Ltd.	Vacuum type portable sander
ES1037776U	1997-07-08	1998-04-01	U B O P S L	Device for treating the feet. (Machine-translation by Google Translate, not legally binding)
US5735833A	1996-12-11	1998-04-07	Bristol-Myers Squibb Co.	Lavage tip
US5759185A	1994-10-24	1998-06-02	Smith & Nephew, Inc.	Surgical instrument
US5762640A	1995-05-31	1998-06-09	Nec Corporation	Effusion fluid sucking device
US5779519A	1996-11-18	1998-07-14	Sunfiles, Llc	Scented fingernail files and buffers
DE29808395U1	1998-05-09	1998-07-16	Ionto-Comed GmbH, 76344 Eggenstein-Leopoldshafen	Hand milling cutters for cosmetic purposes
US5800446A	1997-02-27	1998-09-01	Banuchi; Isabel M.	Article and method for dermabrading
US5807353A	1996-09-16	1998-09-15	Schmitz; Thomas David	Aspiration device with separating element
US5810842A	1994-06-29	1998-09-22	Mattioli Engineering S.R.L.	Equipment for microdermoabrasion through a flow of an air/reducing substances mix
US5813416A	1997-04-03	1998-09-29	Rudolph; James M.	File with sanitizing agent
US5817089A	1991-10-29	1998-10-06	Thermolase Corporation	Skin treatment process using laser
US5817050A	1997-05-29	1998-10-06	Klein; Jeffrey A.	Liposuction cannula
US5834510A	1986-12-23	1998-11-10	Tristrata Technology, Inc.	Compositions comprising 2-hydroxycarboxylic acids and related compounds, and methods for alleviating signs of dermatological aging
US5846215A	1997-12-11	1998-12-08	Chesebrough-Pond's Usa Co., Division Of Conopco, Inc.	Antibacterial swabs
US5848998A	1996-07-11	1998-12-15	Marasco, Jr.; Patrick V.	Tissue debriding apparatus
US5857995A	1996-08-15	1999-01-12	Surgical Dynamics, Inc.	Multiple bladed surgical cutting device removably connected to a rotary drive element
US5861142A	1996-03-25	1999-01-19	Schick; Mary Pichler	Method for promoting hair, nail, and skin keratinization
US5873881A	1995-12-05	1999-02-23	Mcewen; James Allen	Linear drive dermatome
US5879376A	1995-07-12	1999-03-09	Luxar Corporation	Method and apparatus for dermatology treatment
US5882201A	1997-01-21	1999-03-16	Salem; George	Dental debridement method and tool therefor
US5885260A	1991-05-30	1999-03-23	Mehl, Sr.; Thomas L.	Freeze-dried liposome delivery system for application of skin treatment agents
AU1014299A	1997-11-10	1999-05-31	Ronald Allan Greenberg	Improved apparatus and method for micro-abrasions of human tissue and/or hides
US5908401A	1996-05-08	1999-06-01	The Aps Organization, Llp	Method for iontophoretic delivery of antiviral agents
US5911223A	1996-08-09	1999-06-15	Massachusetts Institute Of Technology	Introduction of modifying agents into skin by electroporation
FR2773461A1	1998-01-14	1999-07-16	Alain Favie	Portable skin abrading instrument
US5954730A	1996-05-10	1999-09-21	Mattioli Engineering Ltd.	Mixing bottle for dermabrasion treatment and method of using the same
US5971999A	1995-06-16	1999-10-26	Naldoni; Moreno	Apparatus for microdermabrasion by means of a jet of mixture of air/reducing substances and relating handle
US5980555A	1995-11-07	1999-11-09	Embol-X, Inc.	Method of using cannula with associated filter during cardiac surgery
US6019749A	1998-04-01	2000-02-01	Squeezease, Llc	Apparatus and method for removing material from skin pores
US6023639A	1998-05-01	2000-02-08	Hakky; Said	Non-invasive bodily fluid withdrawal and monitoring system
US6024733A	1995-06-07	2000-02-15	Arthrocare Corporation	System and method for epidermal tissue ablation
US6027402A	1996-11-18	2000-02-22	Sunfiles, Llc	Cosmetic file/buffer with microencapsulated treatment substances
US6032071A	1994-12-01	2000-02-29	Norbert Artner	Skin examination device

US6039745A	1995-06-29	2000-03-21	Mattioli Engineering Ltd.	Equipment for microdermoabrasion through a flow of air/reducing substances mix and relative handpiece
WO2000015300A1	1998-09-16	2000-03-23	Ultra Cure Ltd.	Method for peeling of epithelial tissue and apparatus and system for use therefor
US6042552A	1995-11-27	2000-03-28	Laboratoire C.C.D.	Device for collecting endometrial fragments
US6074382A	1997-08-29	2000-06-13	Asah Medico A/S	Apparatus for tissue treatment
US6080166A	1995-12-05	2000-06-27	Mcewen; James Allen	Direct linear drive dermatome
US6080165A	1999-03-15	2000-06-27	Dejacma; Frederick W.	Self-contained disposable handpiece for a skin tissue removing apparatus
USD428142S	1998-03-20	2000-07-11	Pharmacia & Upjohn Ab	Topical applicator with cap
US6090085A	1991-05-30	2000-07-18	Mehl, Sr.; Thomas L.	Skin moisturizing and buffing device
US6093021A	1997-06-25	2000-07-25	Rainey; J. Tim	Parallel air stream dental air-abrasion system
US6113559A	1997-12-29	2000-09-05	Klopotek; Peter J.	Method and apparatus for therapeutic treatment of skin with ultrasound
US6129701A	1998-11-19	2000-10-10	Sound Surgical Technologies, Llc	Vented aspirator and method
US6136008A	1998-03-19	2000-10-24	3M Innovative Properties Company	Skin abrader for biomedical electrode
US6139554A	1999-06-10	2000-10-31	Karkar; Maurice N.	Multipurpose tissue resurfacing handpiece
US6139553A	1997-09-22	2000-10-31	Dotan; Simon	Facial treatment implement and method
US6149644A	1998-02-17	2000-11-21	Altralight, Inc.	Method and apparatus for epidermal treatment with computer controlled moving focused infrared light
US6159226A	1998-05-12	2000-12-12	Kim; Han-Joon	Tongue cleaning device
US6162218A	1997-03-16	2000-12-19	Aesculap-Meditec Gmbh	Method and arrangement for photoablation
US6162232A *	1999-03-18	2000-12-19	Shaddock; John H.	Instruments and techniques for high-velocity fluid abrasion of epidermal layers with skin cooling
US6165059A	1995-11-24	2000-12-26	Park; Joon	Abrasive medium with selected density
WO2000079540A1	1999-06-18	2000-12-28	Nve Corporation	Magnetic memory coincident thermal pulse data storage
US6174325B1	1992-10-20	2001-01-16	Esc Medical Systems Ltd.	Method and apparatus for therapeutic electromagnetic treatment
US6176198B1	1998-11-02	2001-01-23	Applied Materials, Inc.	Apparatus and method for depositing low K dielectric materials
US6183483B1	2000-04-03	2001-02-06	Henry Ping Chang	Peeling apparatus for removing surface portions of human tissue with purging arrangement
US6190376B1	1996-12-10	2001-02-20	Asah Medico A/S	Apparatus for tissue treatment
US6193589B1	1999-06-21	2001-02-27	Ben M. Khalaj	Hand piece apparatus for abrasive cleaning devices
US6196982B1	1995-10-30	2001-03-06	Terry A. Ball	Vacuum massager
US6231593B1	1994-03-21	2001-05-15	Dusa Pharmaceuticals, Inc.	Patch, controller, and method for the photodynamic therapy of a dermal lesion
US6235039B1	1999-02-23	2001-05-22	Roger C. Parkin	Skin abrasion device
US6238275B1	1998-08-19	2001-05-29	Alva Wesley Metcalf	Contained direct particle beam flow abrasion system
US6241739B1	1999-11-12	2001-06-05	Altair Instruments, Inc.	Microdermabrasion device and method of treating the skin surface
US6245347B1	1995-07-28	2001-06-12	Zars, Inc.	Methods and apparatus for improved administration of pharmaceutically active compounds
US6264666B1	1998-01-26	2001-07-24	William P. Coleman	Water jet for dermatological treatment
US6269271B1	1999-07-27	2001-07-31	Mattioli Engineering Ltd.	Method and apparatus for skin brown spot removal
US6277116B1	1994-05-06	2001-08-21	Vidaderm	Systems and methods for shrinking collagen in the dermis
US6277128B1	1998-07-11	2001-08-21	J. Scott Muldner	Skin abrasion treatment device

US6280438B1	1992-10-20	2001-08-28	Esc Medical Systems Ltd.	Method and apparatus for electromagnetic treatment of the skin, including hair depilation
US6284266B1	1995-07-28	2001-09-04	Zars, Inc.	Methods and apparatus for improved administration of fentanyl and sufentanil
US6283978B1	2000-06-09	2001-09-04	Peter J. Cheski	Method and apparatus for microdermabrasion
US20010023351A1	1999-12-01	2001-09-20	Eilers George J.	Skin abrasion system and method
US6299620B1	1999-03-18	2001-10-09	Aq Technologies, Inc.	Instruments and techniques for inducing neocollagenesis in skin treatments
US6306119B1	1999-01-20	2001-10-23	Pearl Technology Holdings, Llc	Skin resurfacing and treatment using biocompatible materials
US6306147B1	1994-06-29	2001-10-23	Mattioli Engineering Ltd.	Dermabrasion by a flow of reducing substances and having disposable sterilized components
US6322568B1	1994-06-29	2001-11-27	Mattioli Engineering Ltd.	Dermabrasion by a flow of reducing substances and having disposable sterilized components
US6322548B1	1995-05-10	2001-11-27	Eclipse Surgical Technologies	Delivery catheter system for heart chamber
US6325769B1	1998-12-29	2001-12-04	Collapeutics, Llc	Method and apparatus for therapeutic treatment of skin
US6325381B1	1999-05-04	2001-12-04	System Seals, Inc.	High-pressure rotary seal
US20010049511A1 *	1999-03-17	2001-12-06	William P. Coleman	Water jet for dermatological treatment
WO2001093931A1	2000-06-06	2001-12-13	Becton, Dickinson And Company	Method and apparatus for enhancing penetration of a puncturing member into the intradermal space
US6332886B1	1999-02-03	2001-12-25	Synthes (Usa)	Surgical reamer and method of using same
US6334074B1	1997-07-31	2001-12-25	Microwave Medical Corp.	Microwave applicator for therapeutic uses
US20020016601A1	2000-01-03	2002-02-07	Shadduck John H.	Instruments and techniques for inducing neocollagenesis in skin treatments
US6355054B1	1999-11-05	2002-03-12	Ceramoptec Industries, Inc.	Laser system for improved transbarrier therapeutic radiation delivery
US20020040199A1	1997-12-29	2002-04-04	Klopotek Peter J.	Method and apparatus for therapeutic treatment of skin
US20020041891A1	2000-06-09	2002-04-11	Cheski Peter J.	Method and apparatus for microdermabrasion
US6387089B1	1995-09-15	2002-05-14	Lumenis Ltd.	Method and apparatus for skin rejuvenation and wrinkle smoothing
US6387103B2	1999-12-30	2002-05-14	Aq Technologies, Inc.	Instruments and techniques for inducing neocollagenesis in skin treatments
US20020058952A1	2000-11-10	2002-05-16	Pearl Technology Holdings, Llc	Tissue resurfacing using biocompatible materials
US6401289B1	2001-08-24	2002-06-11	Linda S. Herbert	Skin cleaning device
US6410599B1	1999-09-22	2002-06-25	Ron Johnson	Antiseptic compositions suitable for application to human tissue
KR200280320Y1	2002-03-21	2002-07-02	이명호	The device for peeling a thin skin
USRE37796E1	1997-12-16	2002-07-23	Biophoretic Therapeutic Systems, Llc	Methods for iontophoretic delivery of antiviral agents
US6423078B1	1999-04-23	2002-07-23	Medtronic Xomed, Inc.	Dermabrasion instrument, instrument assembly and method
US20020099356A1	2001-01-19	2002-07-25	Unger Evan C.	Transmembrane transport apparatus and method
US20020107527A1	2000-10-05	2002-08-08	Burres Steven A.	Dermabrasion and skin care apparatus
US6432113B1	1999-02-23	2002-08-13	Roger C. Parkin	Skin abrasion device
US6432114B1	1999-06-16	2002-08-13	L.I.C.A. S.R.L.	Device for making hydro-microabrasions on human tissue
CA2340154A1	2001-03-09	2002-09-09	Marc Hoffman	Dermabrasion hand tool for abrasively removing skin surface
EP1238643A1	1999-12-01	2002-09-11	S.O.R. Internacional, S.A.	Application head for an apparatus used in cosmetic surgery and electromedicine
US20020128663A1	2001-03-09	2002-09-12	Silhouet-Tone Ltee	Dermabrasion hand tool for abrasively removing skin surface
US20020133176A1	2001-03-13	2002-09-19	Dermamed, Inc.	Microderm abrasion device and method

US20020133110A1	2001-01-19	2002-09-19	Citow Jonathan Stuart	Device for treatment of inflamed tissue
US6458109B1	1998-08-07	2002-10-01	Hill-Rom Services, Inc.	Wound treatment apparatus
US20020151826A1	1999-05-11	2002-10-17	John S. Ramey	Massage apparatus and methods
US6477410B1	2000-05-31	2002-11-05	Biophoretic Therapeutic Systems, Llc	Electrokinetic delivery of medicaments
US20020162863A1	2001-03-14	2002-11-07	Kennth Brincat	Refillable bottle and system of reuse
US6488646B1	2001-09-12	2002-12-03	Unilever Home & Personal Care Usa	Swab deliverable actives
US20020188261A1	2001-06-07	2002-12-12	Dermacel Inc.	Hand piece for use in a dermal abrasion system
US6494856B1	2001-09-12	2002-12-17	Unilever Home & Personal Care Usa, Division Of Conopco, Inc.	Swab deliverable actives
US20020198488A1	2001-06-22	2002-12-26	Tzu-Chiang Yao	Cleansable multi-purpose nasal discharge aspirator
US20030012415A1	2001-07-10	2003-01-16	Cossel Travis M.	Method and apparatus to biometrically authenticate MFP users
US6508813B1	1996-12-02	2003-01-21	Palomar Medical Technologies, Inc.	System for electromagnetic radiation dermatology and head for use therewith
US20030018252A1 *	1995-04-20	2003-01-23	Duchon Douglas J.	Angiographic injector system and method of use
US6514262B1	1994-06-29	2003-02-04	Mattioli Engineering Ltd.	Dermabrasion by a flow of reducing substances and having disposable sterilized components
US6514278B1	1998-05-28	2003-02-04	Carl Baasel Lasertechnik Gmbh	Method and device for the superficial heating of tissue
US6518538B2	2000-10-18	2003-02-11	Mattioli Engineering Ltd.	Method and apparatus for plasma skin resurfacing
US6520931B2	2000-08-17	2003-02-18	G-Intek Co., Ltd.	Medical instrument
US6527783B1	2000-03-31	2003-03-04	Edge Systems Corporation	Microdermabrasion and suction massage apparatus and method
US6527716B1	1997-12-30	2003-03-04	Altea Technologies, Inc.	Microporation of tissue for delivery of bioactive agents
US6535761B2	2001-04-06	2003-03-18	Mattioli Engineering Ltd.	Method and apparatus for skin absorpion enhancement
USD472136S1	2001-06-20	2003-03-25	The Procter & Gamble Company	Bottle with cap
US20030060834A1	2001-09-24	2003-03-27	Muldner Janelle Marie	Single-hand operable microdermabrasion device
US6540757B1	2001-07-13	2003-04-01	James C. Fallon	Cartridge for use in a dermal abrasion system
US6562013B1	1996-07-11	2003-05-13	Pulsecare Medical Llc	Kit assembly for complete wound treatment
US6564093B1	1995-04-23	2003-05-13	Electromagnetic Bracing Systems Inc.	Transdermal active drug delivery system and method
US6562050B1	1999-11-29	2003-05-13	Vital Assist, Inc.	Equipment for microdermabrasion
US20030093040A1	2001-10-29	2003-05-15	Miksza John A.	Method and device for the delivery of a substance
US20030093089A1	1999-10-20	2003-05-15	Greenberg Ronald Allan	Apparatus for variable micro abrasion of human tissue and/or hides using different size and types of abrasive particles
US6565535B2	2000-06-16	2003-05-20	Nardo Zaias	Medical infusion and aspiration system
US20030097139A1	2001-11-21	2003-05-22	Karasiuk Kenneth B.	Microdermabrasion system and method of use
US6569157B1	1998-05-18	2003-05-27	Abbott Laboratories	Removal of stratum corneum by means of light
US6582442B2	2000-02-28	2003-06-24	Dynatronics Corporation	Method and system for performing microabrasion
US6587730B2	1999-07-27	2003-07-01	Mattioli Engineering Ltd.	Method and apparatus for skin brown spot removal and collagen formation
US6589218B2	2001-01-23	2003-07-08	Teddy Garcia	Suction device for removing material from skin pores
US20030135388A1	2002-01-11	2003-07-17	James Martucci	Medication delivery system
US6595934B1	2000-01-19	2003-07-22	Medtronic Xomed, Inc.	Methods of skin rejuvenation using high intensity focused ultrasound to form an ablated tissue area containing a plurality of lesions
US6611706B2	1998-11-09	2003-08-26	Transpharma Ltd.	Monopolar and bipolar current application for transdermal drug delivery and analyte extraction

WO2003073917A2	2002-03-01	2003-09-12	Edge Systems Corporation	Microdermabrasion fluid application system and method
US6626445B2	1999-12-02	2003-09-30	Alcon Universal Ltd.	Cart for surgical console
US20030187462A1	2002-03-14	2003-10-02	Chang Henry Ping	Tissue removal pen
US6629983B1	2000-10-27	2003-10-07	Edge Systems Corporation	Apparatus and method for skin/surface abrasion
US6629927B1	2002-05-23	2003-10-07	Koninklijke Philips Electronics N.V.	Diagnostic ultrasound system cart with integral cable supports
US6629971B2	1998-11-30	2003-10-07	McDaniel David	Process for stimulating hair growth
US6629974B2	2000-02-22	2003-10-07	Gyrus Medical Limited	Tissue treatment method
US6635035B1	2000-05-02	2003-10-21	Patrick V. Marasco	Tissue irrigation arrangement
US6641591B1	1999-08-26	2003-11-04	John H. Shadduck	Instruments and techniques for controlled removal of epidermal layers
US6645184B1	1999-08-09	2003-11-11	Brian D. Zelickson	Tape stripping system and method
US20030212415A1	2001-11-21	2003-11-13	Karasiuk Kenneth B.	Skin treatment system and method of use
US20030212127A1	2002-05-09	2003-11-13	Bradley Pharmaceuticals, Inc.	Method of treating actinic keratosis
US6652888B2	1999-10-04	2003-11-25	Dermanew, Inc.	Method for skin rejuvenation with buffing cream
JP2003339713A	2002-05-24	2003-12-02	Twinbird Corp	Keratin grinding cosmetic instrument
US6666874B2	1998-04-10	2003-12-23	Endicor Medical, Inc.	Rotational atherectomy system with serrated cutting tip
US6673081B1	1997-10-22	2004-01-06	Tav Tech Ltd.	Dermal abrasion
US20040005349A1	2000-05-12	2004-01-08	Joseph Neev	Opto-thermal material modification
US20040010269A1	2002-07-11	2004-01-15	Grimes Pearl E.	Microdermabrasion composition and kit
US20040010222A1	2002-01-21	2004-01-15	The Procter & Gamble Company And Matsushita Electric Works, Ltd.	Skin care device
US20040015139A1	2002-07-17	2004-01-22	La Bianco Kerrie L.	Skin treatment apparatus and methods
US6685853B1	1997-05-29	2004-02-03	International Business Machines Corporation	Energy sensitive electrically conductive admixtures, uses thereof, methods of fabrication and structures fabricated therewith
US6687537B2	2001-04-06	2004-02-03	Mattioli Engineering Ltd.	Method and apparatus for skin absorption enhancement and cellulite reduction
US6689380B1	1999-05-17	2004-02-10	Kevin S. Marchitto	Remote and local controlled delivery of pharmaceutical compounds using electromagnetic energy
USD486915S1	2002-10-07	2004-02-17	Ohio Medical Instrument Company, Inc.	Surgical cart
US6699237B2	1999-12-30	2004-03-02	Pearl Technology Holdings, Llc	Tissue-lifting device
US6712805B2	2001-01-29	2004-03-30	Ultra Sonic Tech Llc	Method and apparatus for intradermal incorporation of microparticles containing encapsulated drugs using low frequency ultrasound
US6726673B1	1999-05-24	2004-04-27	Zars, Inc.	Methods and apparatus for improved administration of testosterone pharmaceuticals
WO2004037098A1	2002-10-21	2004-05-06	Bionoface	Micro-abrasion device
WO2004037287A2	2002-05-23	2004-05-06	Palomar Medical Technologies, Inc.	Phototreatment device for use with coolants and topical substances
US20040087972A1	2002-09-16	2004-05-06	Mulholland Robert Stephen	Skin abrading apparatus
US20040092895A1	2002-11-07	2004-05-13	Harmon Kim R.	Soft contact tip for use with a hand-held debridement device
US20040092959A1	2000-12-24	2004-05-13	Gabriel Bernaz	Device for dermabrasion
USD490561S1	2001-05-16	2004-05-25	Joseph G. Angeletta	Combined finger-held liquid and lotion applicator and cover
US6743211B1	1999-11-23	2004-06-01	Georgia Tech Research Corporation	Devices and methods for enhanced microneedle penetration of biological barriers
US6743215B2	2001-04-06	2004-06-01	Mattioli Engineering Ltd.	Method and apparatus for skin absorption enhancement and cellulite reduction

US20040122447A1	2002-12-19	2004-06-24	Harmon Kim R.	Brush tip for use with a hand-held debridement device
US20040127914A1	2002-09-06	2004-07-01	Tae-Jun Chung	Hand piece for microdermabrasion device
US20040138680A1	2002-11-26	2004-07-15	Twitchell David J.	Microdermabrasion apparatus and system
US20040162565A1	2003-02-19	2004-08-19	Unilever Home & Personal Care Usa, Division Of Conopco, Inc.	Abrasion device and method
US20040166172A1	2001-03-27	2004-08-26	Coni Rosati	Bioactive tissue abrasives
US20040176823A1	2003-02-25	2004-09-09	Island Tobin C.	Acne treatment device and method
USD496101S1	2003-01-18	2004-09-14	Owen Mumford Limited	Tip for syringe for taking blood samples
US6800083B2	2001-04-09	2004-10-05	Scimed Life Systems, Inc.	Compressible atherectomy burr
US6800849B2	2001-12-19	2004-10-05	Sau Lan Tang Staats	Microfluidic array devices and methods of manufacture and uses thereof
JP2004275721A	2003-02-25	2004-10-07	Matsushita Electric Works Ltd	Ultrasonic living body washing device
US20040210280A1	2002-10-25	2004-10-21	Bionics Pharma Gmbh	Plaster-type chip systems for thermodynamic control of topical dermal and transdermal systems
US20040219179A1	2002-09-20	2004-11-04	Mcdaniel David H.	Skin abrasive agents
US20040229295A1	1999-05-17	2004-11-18	Marchitto Kevin S.	Activated delivery of biomolecules using electromagnetic energy
US20040236291A1	1999-08-09	2004-11-25	Zelickson Brian D.	Skin abrasion system and method
US20040236375A1	2002-01-15	2004-11-25	Redding Bruce K	Wearable, portable sonic applicator for inducing the release of bioactive compounds from internal organs
USD499207S1	2001-08-06	2004-11-30	Joseph G. Angeletta	Palm-held liquid and lotion applicator
US20040243149A1	2003-05-27	2004-12-02	Lee John B.	Removable cartridge for a microdermabrasion unit
USD499841S1	2001-01-30	2004-12-14	Joseph G. Angeletta	Vibrating attachment for a liquid and lotion applicator
US20040254587A1	2001-09-12	2004-12-16	Joon Park	Pedicure implement having a contoured surface
WO2004108091A2	2003-06-06	2004-12-16	Board Of Regents, The University Of Texas System	Antimicrobial flush solutions
US20040267285A1	2003-06-24	2004-12-30	Mei Yin Chang	Microdermabrasion canister rack system
US20050015077A1	2003-07-14	2005-01-20	Yevgeniy Kuklin	Method and apparatus for skin treatment using near infrared laser radiation
US20050037034A1	2003-05-05	2005-02-17	Rhoades Dean L.	Method, apparatus, and composition for treating acne
US20050038448A1	2003-08-14	2005-02-17	Tae-Jun Chung	Skin resurfacing device
US20050038377A1	2000-08-24	2005-02-17	Redding Bruce K.	Ultrasonically enhanced substance delivery system and device
USD502289S1	2004-02-19	2005-02-22	Longoria Design Llc	Cover for a hair coloring apparatus head
USD502288S1	2004-02-19	2005-02-22	Longoria Design Llc	Hair coloring apparatus
USD502569S1	2004-02-19	2005-03-01	Longoria Design Llc	Housing for hair coloring apparatus head
US20050059940A1	1999-01-20	2005-03-17	Pearl Technology Holdings, Llc.	Skin resurfacing and treatment using biocompatible materials
US6869611B1	1996-02-08	2005-03-22	Douglas E. Kligman	Composition and method of effecting superficial chemical skin peels
US20050070977A1	2003-04-28	2005-03-31	Molina Sherry L.	Light and magnetic emitting mask
US20050075599A1	2001-08-24	2005-04-07	Redding Bruce K.	Ultrasonically enhanced saline treatment for burn damaged skin
US20050080465A1	2002-03-15	2005-04-14	Brian Zelickson	Device and method for treatment of external surfaces of a body utilizing a light-emitting container
US20050084509A1	2003-10-20	2005-04-21	Bernstein Eric F.	Use of citric acid and low concentrations of alpha-hydroxy acids for superficial skin treatment
US6887260B1	1998-11-30	2005-05-03	Light Bioscience, Llc	Method and apparatus for acne treatment

US6905487B2	2001-08-27	2005-06-14	Maryann B. Zimmerman	Dermal treatment applicator and method relating thereto
W02005061042A1	2003-12-18	2005-07-07	Cms Co., Ltd.	Vacuum impregnation apparatus for growing and restoring hair
US20050148958A1	1994-06-14	2005-07-07	Rucinski Paul J.	Novel wound irrigation device and method
W02005070313A1	2004-01-21	2005-08-04	Crystal Clear International Limited	Microdermabrasion device
US6926681B1	1999-05-11	2005-08-09	Dynatronics Corporation	Method and system for performing microabrasion and suction massage
US20050203111A1	2004-03-12	2005-09-15	Vvii Newco 2003, Inc.	Compositions and methods for preventing and treating skin and hair conditions
US20050203593A1	2003-10-24	2005-09-15	Shanks Steven C.	Method for dermatology therapies in combination with low level laser treatments
US20050209611A1	2000-10-20	2005-09-22	Greenberg Ronald A	Apparatus for variable micro abrasion of human tissue and/or hides using different size and types of abrasive particles
US6960206B2	1999-09-15	2005-11-01	The General Hospital Corporation	Coiled ablation catheter system
DE102004015815A1	2004-03-31	2005-11-03	Bundesrepublik Deutschland, vertreten durch das Bundesministerium der Verteidigung, dieses vertreten durch das Bundesamt für Wehrtechnik und Beschaffung	Arrangement for applying 2-component skin detoxifying agent to combat skin and nerve chemical warfare agents, has separate pump bottles for supplying components to common application head
US20050283176A1	2004-06-22	2005-12-22	Wahson Law	Advanced disposable microdermabrasion system/method of treating the skin surface
US6980448B2	1990-04-06	2005-12-27	Mosaid Technologies, Inc.	DRAM boosted voltage supply
US20060002960A1	2003-12-09	2006-01-05	Paul Zoetewij	GM1 binding deficient exotoxins for use as immunoadjuvants
US20060015059A1	2002-01-16	2006-01-19	Redding Bruce K Jr	Substance delivery device
W02006018731A2	2004-08-18	2006-02-23	Malak Jean Clement Edouart Gui	Hyperbar transcuteaneous oxygenotherapy by fluorocarbon projection
US7004933B2	1998-05-29	2006-02-28	Light Bioscience L.L.C.	Ultrasound enhancement of percutaneous drug absorption
US20060058714A1	2004-09-10	2006-03-16	Rhoades Dean L	Oxygenating cosmetic instrument having various numbers of heads
USD517699S1	2003-04-19	2006-03-21	Eric Lansohn	Photodynamic therapy applicator
US7031805B2	2003-02-06	2006-04-18	Samsung Gwangju Electronics Co., Ltd.	Robot cleaner system having external recharging apparatus and method for docking robot cleaner with external recharging apparatus
US20060100567A1	2004-07-30	2006-05-11	Rocky Mountain Biosystems, Inc	Microsurgical tissue treatment system
US7052503B2	1994-06-29	2006-05-30	Mattioli Engineering, Ltd.	Dermaabrasion apparatus and method having oval-shaped mixing bottle
US20060116674A1	2000-02-22	2006-06-01	Rhytec Limited	Method of regenerating the reticular architecture of the dermis
USD522360S1	2005-04-28	2006-06-06	Zobeles Espana, S.A.	Cap for containers of air-fresheners, insecticides, and the like
US7083580B2	2001-04-06	2006-08-01	Mattioli Engineering Ltd.	Method and apparatus for skin absorption enhancement and transdermal drug delivery
US7087036B2	2002-05-24	2006-08-08	Baxter International Inc.	Fail safe system for operating medical fluid valves
JP2006204767A	2005-01-31	2006-08-10	Matsushita Electric Works Ltd	Skin care device
US20060184071A1	1997-12-29	2006-08-17	Julia Therapeutics, Llc	Treatment of skin with acoustic energy
US7094252B2	2001-08-21	2006-08-22	Cooltouch Incorporated	Enhanced noninvasive collagen remodeling
US20060189964A1	2004-05-07	2006-08-24	Anderson Robert S	Apparatus and method to apply substances to tissue
US20060212029A1	2004-02-20	2006-09-21	Arcusa Villacampa Francisco J	Equipment and method for reducing and eliminating wrinkles in the skin
US20060212025A1	1998-11-30	2006-09-21	Light Bioscience, Llc	Method and apparatus for acne treatment
US7115275B2	2002-09-16	2006-10-03	Zicam, Llc	System for delivering a composition to the nasal membrane and method of using same

US20060222445A1	2005-03-31	2006-10-05	Kaiwin Chuang	Dispenser head for fluid container
US7118563B2	2003-02-25	2006-10-10	Spectragenics, Inc.	Self-contained, diode-laser-based dermatologic treatment apparatus
US7122029B2	1999-07-29	2006-10-17	Cooltouch Incorporated	Thermal quenching of tissue
US20060235371A1	2005-04-07	2006-10-19	Shingo Wakamatsu	Microscopic-spots irradiating device applying a vacuum thereto
US20060253079A1	2005-04-25	2006-11-09	Mcdonough Justin	Stratum corneum piercing device
US20060253125A1	2005-03-07	2006-11-09	Ignon Roger G	Microdermabrasion method and apparatus
US7135011B2	2002-12-09	2006-11-14	Jeffrey Lewis Powers	Portable device for dispensing skin treatments
US20060264926A1	2002-11-08	2006-11-23	Kochamba Gary S	Cutaneous stabilization by vacuum for delivery of micro-needle array
US20060264893A1	1999-09-24	2006-11-23	Sage Jr Burton H	Method and device for abrading skin
US20060269580A1	2004-07-16	2006-11-30	Cole Curtis A	Treatment of skin with light and a benefit agent to mitigate acne
US20060278661A1	2003-05-09	2006-12-14	Cooper Steven C	Gantry tower spraying system with cartridge/receptacle assembly
USD533962S1	2003-06-26	2006-12-19	Angeletta Joseph G	Replaceable component for a liquid and lotion applicator
US20070005078A1	2005-06-30	2007-01-04	Cosmedic R & D, Inc.	System for abrading skin to remove outer portions thereof
US7166086B2	2002-08-29	2007-01-23	Becton, Dickinson And Company	Substance delivery via a rotating microabrading surface
US20070020321A1	2003-01-16	2007-01-25	Redding Bruce K	Method for enhancing attenuation characteristic of absorbent materials useful with dermal and transdermal substance delivery systems
USD536481S1	2001-05-16	2007-02-06	Angeletta Joseph G	Replaceable component for a liquid and lotion applicator
US7172572B2	2001-10-04	2007-02-06	Boston Scientific Scimed, Inc.	Manifold system for a medical device
US20070043382A1	2005-08-18	2007-02-22	Cheney Sharon A	Thermal separation of impurities from the scalp, hair, and skin
US7189230B2	1996-01-05	2007-03-13	Thermage, Inc.	Method for treating skin and underlying tissue
US20070065515A1	2005-09-22	2007-03-22	Key Douglas J	Methods and compositions for treating skin lines and wrinkles and improving skin quality
US7197359B1	1999-10-14	2007-03-27	Pola Chemical Industries Inc.	Compositions for electroporation
US20070073327A1	2004-01-23	2007-03-29	Joseph Giovannoli	Method and apparatus for excising skin
US7198623B2	2003-01-10	2007-04-03	Ultradent Products, Inc.	Fiber-coated dental infusor systems and methods of use
US20070078290A1	2005-09-30	2007-04-05	Esenaliev Rinat O	Ultrasound-based treatment methods for therapeutic treatment of skin and subcutaneous tissues
US20070088245A1	2005-06-23	2007-04-19	Celleration, Inc.	Removable applicator nozzle for ultrasound wound therapy device
US20070093694A1	2005-10-25	2007-04-26	Fassuliotis Thomas M	Surgical suction instrument
US20070139630A1	2005-12-19	2007-06-21	Nikon Precision, Inc.	Changeable Slit to Control Uniformity of Illumination
USD545207S1	2005-09-02	2007-06-26	Bulgari S.P.A.	Perfume container
US20070149991A1	2005-12-22	2007-06-28	Spamedica International Srl Of Warrens	Skin rejuvenation resurfacing method
US20070154502A1	2005-12-30	2007-07-05	Judy Hattendorf	Method of treating skin requiring microdermabrasion
US20070156124A1	2005-12-30	2007-07-05	Roger Ignon	Apparatus and methods for treating the skin
US7250045B2	2003-02-25	2007-07-31	Spectragenics, Inc.	Self-contained, eye-safe hair-regrowth-inhibition apparatus and method
US20070178121A1	2006-01-27	2007-08-02	Allergan, Inc.	Methods for enhancing skin treatments
US20070198031A1	2006-02-21	2007-08-23	David Kellogg	Method for performing dermabrasion
US20070232987A1	2006-02-22	2007-10-04	Vicente Diaz	One-hand-operated ultrasound transducer and method for delivering a controlled and uniform distribution of a sterile or a non-sterile topical reagent to skin for use in diagnostic, therapeutic, and aesthetic therapies

US20070239079A1	2006-04-07	2007-10-11	The General Hospital Corporation	Method and apparatus for selective treatment of biological tissue using ultrasound energy
US20070239173A1	2006-03-30	2007-10-11	Khalaj Ben M	Hydro-dermabrasion apparatus and method of use
W02007114904A2	2006-04-04	2007-10-11	Amcol International Corporation	Cosmetic and therapeutic stick products comprising microparticles
USD553005S1	2003-01-27	2007-10-16	Medical Instill Technologies, Inc.	Container and valve assembly
US20070255355A1	2006-04-06	2007-11-01	Palomar Medical Technologies, Inc.	Apparatus and method for skin treatment with compression and decompression
US20070264625A1	2006-05-11	2007-11-15	Reliant Technologies, Inc.	Apparatus and Method for Ablation-Related Dermatological Treatment of Selected Targets
US20070270738A1	2005-04-25	2007-11-22	Wu Jeffrey M	Method of treating ACNE with stratum corneum piercing patch
USD557611S1	2006-09-14	2007-12-18	V & S Vin & Sprit Aktiebolag (Publ)	Bottle
US7314326B2	2001-07-19	2008-01-01	4-Med	Device and method for treating pathologically affected skin
US7316657B2	2002-02-15	2008-01-08	Beiersdorf Ag	Massage appliance with adjustable massage characteristics and storage container
US20080009802A1	2005-04-25	2008-01-10	Danilo Lambino	Method of treating acne with stratum corneum piercing device
US7318828B1	2004-09-20	2008-01-15	Jacob Revivo	Microdermabrasion machine
US20080015555A1	2003-03-27	2008-01-17	The General Hospital Corporation	Method and apparatus for dermatological treatment and fractional skin resurfacing
US7320691B2	2003-01-15	2008-01-22	Pacific Bioscience Laboratories, Inc.	Apparatus and method for acoustic/mechanical treatment of early stage acne
US7320801B2	2005-09-26	2008-01-22	Jack Perez Kelly	Patch for treating symptoms of a skin abscess
US20080027328A1	1997-12-29	2008-01-31	Julia Therapeutics, Llc	Multi-focal treatment of skin with acoustic energy
W02008012324A1	2006-07-26	2008-01-31	Maurizio Busoni	Disposable accessory for dermabrasion apparatus handpieces and handpieces provided with said accessory
US7326199B2	2003-12-22	2008-02-05	Cutera, Inc.	System and method for flexible architecture for dermatologic treatments utilizing multiple light sources
US7329252B1	2000-05-19	2008-02-12	Ya-Man Ltd.	Apparatus for laser depilation
US20080091179A1	1999-12-10	2008-04-17	Candela Corporation	Compact, handheld device for home-based acne treatment
US20080091126A1	2005-03-09	2008-04-17	Greenburg Allan R	Apparatus and Method of Body Contouring and Skin Conditioning
US7364565B2	2001-07-27	2008-04-29	Ramot At Tel Aviv University Ltd.	Controlled enzymatic removal and retrieval of cells
US20080103563A1	2006-10-26	2008-05-01	Lumiport, Llc	Light therapy personal care device
US20080119781A1	2006-11-22	2008-05-22	Jonathan King	Method and apparatus for treating scar tissue
US20080132914A1	2003-06-06	2008-06-05	Reckitt Benckiser (Uk) Limited	Device and Method for Removing a Composition From the Skin
US20080139974A1	2006-12-04	2008-06-12	Da Silva Luiz B	Devices and Methods for Treatment of Skin Conditions
US20080146970A1	2005-12-06	2008-06-19	Julia Therapeutics, Llc	Gel dispensers for treatment of skin with acoustic energy
US20080154183A1	2006-11-06	2008-06-26	Aardvark Medical, Llc	Irrigation and aspiration device and method
US20080154161A1	2006-12-22	2008-06-26	Abbott Laura W	Handheld massager
US20080161799A1	2006-12-29	2008-07-03	Todd Stangenes	Position independent catheter
US20080188840A1	2007-02-02	2008-08-07	Charles Johnson	Handpiece used for cosmetic or dermatologic treatment
US20080193493A1	1999-10-04	2008-08-14	Dean Rhoades	Method for treating skin with a pad
US20080200861A1	2006-12-13	2008-08-21	Pinchas Shalev	Apparatus and method for skin treatment
US20080200863A1	2005-12-02	2008-08-21	Cabochon Aesthetics, Inc.	Devices and methods for selectively lysing cells
US20080208179A1	2006-10-26	2008-08-28	Reliant Technologies, Inc.	Methods of increasing skin permeability by treatment with electromagnetic radiation

US20080208146A1	2005-04-07	2008-08-28	Brandwein David H	System and Method for Tool Feedback Sensing
US20080214987A1	2006-12-22	2008-09-04	Nanomed Devices, Inc.	Microdevice And Method For Transdermal Delivery And Sampling Of Active Substances
US20080215068A1	2005-06-30	2008-09-04	Cosmedic R & D, Inc.	Skin treatment system
US20080221548A1	2005-08-01	2008-09-11	Noam Danenberg	Eradication of Pigmentation and Scar Tissue
US7427273B2	2004-03-01	2008-09-23	Japan Natural Laboratory Co., Ltd.	Skin beautification cosmetic system using iontophoresis device, ultrasonic facial stimulator, and cosmetic additive
US20080234626A1	2006-04-26	2008-09-25	Chelak Todd M	Multi-stage microporation device
US20080287864A1	1999-09-22	2008-11-20	Rosenberg Zeil B	Method and Apparatus for the Transdermal Administration of a Substance
US7458944B2	2001-10-04	2008-12-02	Beiersdorf Ag	Cosmetic cleaning product
US20080300552A1	2007-06-01	2008-12-04	Cichocki Frank R	Thermal forming of refractory alloy surgical needles
US20080300529A1	2007-06-04	2008-12-04	Farr Laboratories, Llc	Skin Care Method and Kit Using Peltier Thermoelectric Device
USD584151S1	2008-01-14	2009-01-06	Kranson Industries	Bottle cap
US7476205B2	2005-06-10	2009-01-13	Alfons Erdmann	Apparatus for treatment of patients who suffer from lesions distributed on the surface of their skin and body cover
US7477938B2	2003-06-30	2009-01-13	Johnson & Johnson Cosumer Companies, Inc.	Device for delivery of active agents to barrier membranes
US7485125B2	2001-12-17	2009-02-03	Smith & Nephew, Inc.	Cutting instrument
US7489989B2	2004-03-11	2009-02-10	Oleg Alexeevich Sukhanov	System for dispatching and controlling of generation in large-scale electric power systems
US20090048557A1	2006-04-20	2009-02-19	Yehushua Yeshurun	Device and methods combining vibrating micro-protrusions with phototherapy
US20090053390A1	2005-03-31	2009-02-26	Shigeto Sakou	Novel Candy and Process for Producing the Same
US20090062815A1	2007-08-28	2009-03-05	Emed, Inc.	Handheld microdermabrasion device
US7507228B2	2003-06-30	2009-03-24	Johnson & Johnson Consumer Companies, Inc.	Device containing a light emitting diode for treatment of barrier membranes
US20090099091A1	2007-06-27	2009-04-16	The Board Of Trustees Of The Leland Stanford Junior University	Oligopeptide Tyrosinase Inhibitors and Uses Thereof
US20090099093A1	2007-06-27	2009-04-16	The Board Of Trustees Of The Leland Stanford Junior University	Peptide Tyrosinase Inhibitors and Uses Thereof
US20090118684A1	2007-11-05	2009-05-07	Da Silva Luiz B	Thermal personal care systems and methods
US20090124985A1	2007-06-13	2009-05-14	Erik John Hasenoehrl	Skin treatment device
US20090132012A1	2007-11-16	2009-05-21	Therapy Products, Inc.	Method for pretreating patient before surgery
US20090138026A1	2007-11-26	2009-05-28	Yueh-Chin Wu	Water dermabrasion and skincare device and method thereof
US20090171194A1	2007-12-21	2009-07-02	Carticept Medical, Inc.	Methods of injecting fluids into joints using a handpiece assembly
WO2009088884A1	2008-01-04	2009-07-16	Edge Systems Corporation	Apparatus and method for treating the skin
WO2009097451A1	2008-01-29	2009-08-06	Edge Systems Corporation	Apparatus and method for treating the skin
US7572238B2	1999-10-04	2009-08-11	Dermanew, Inc.	Handheld sonic microdermabrasion porous applicator
US7582067B2	2005-03-15	2009-09-01	Ted Gerard Van Acker	Prepared medication applicator including a swab and a pharmacological active agent
US20090222023A1	2008-02-29	2009-09-03	Emed, Inc.	Microdermabrasion Treatment Heads
US7597900B2	2001-03-27	2009-10-06	Schott Ag	Tissue abrasives
EP2106780A1	2008-04-03	2009-10-07	Rodolfo Pomar	Method for treating the scalp to slow and prevent hair loss and kit for performing the method
US20090254014A1	2008-04-04	2009-10-08	Son Gi-Jun	Mask for massaging the face
US7607972B2	2006-06-13	2009-10-27	Boaz Barry Groman	Self-contained disposable micro-abrasive blasting tip for dental applications

US20100023003A1	2005-12-22	2010-01-28	Spamedica International Srl	Skin rejuvenation resurfacing device and method of use
US20100048980A1	2007-04-18	2010-02-25	Koninklijke Philips Electronics N.V.	Electro-mechanical massage device and wearable massage apparatus
WO2010022396A2	2008-08-22	2010-02-25	Envy Medical, Inc.	Microdermabrasion system with security mechanism
US20100049177A1	2008-08-22	2010-02-25	Emed, Inc.	Microdermabrasion System with Combination Skin Therapies
US20100049210A1	2008-08-22	2010-02-25	Emed, Inc.	Microdermabrasion System Upgrade Kit
US20100056847A1	2007-04-18	2010-03-04	Koninklijke Philips Electronics N.V.	Electro-mechanical massage device and wearable massage apparatus
US20100063565A1	2006-11-18	2010-03-11	Braun Gmbh	Skin Treatment Device
US7730979B2	2005-11-07	2010-06-08	Randy Kahrig	Method of, and apparatus for, cleaning the exterior of tubing
US7731570B2	2005-03-10	2010-06-08	Boaz Barry Groman	Micro-abrasive blasting devices with perturbation control
US7740651B2	2007-09-28	2010-06-22	Candela Corporation	Vacuum assisted treatment of the skin
WO2010068960A1	2008-12-15	2010-06-24	Silverbrook Research Pty Ltd	Molded ink manifold with polymer coating
US7744582B2	1998-08-11	2010-06-29	Antares Pharma, Inc.	Needle assisted jet injector
US7749260B2	2004-12-10	2010-07-06	Da Silva Luiz B	Devices and methods for treatment of skin conditions
EP2206483A1	2009-01-12	2010-07-14	Andrea Uterstädt	Anti-wrinkle pin
US7758537B1	1995-11-22	2010-07-20	Arthrocare Corporation	Systems and methods for electrosurgical removal of the stratum corneum
US7771374B2	2001-12-10	2010-08-10	Candela Corporation	Method and apparatus for vacuum-assisted light-based treatments of the skin
US20100217357A1	2008-10-31	2010-08-26	Da Silva Luiz B	Methods and Apparatus for Personal Care
USD625198S1	2010-03-15	2010-10-12	Jason David Hall	Anti-bacterial fogger
US7814915B2	2006-03-03	2010-10-19	Cutera, Inc.	Aesthetic treatment for wrinkle reduction and rejuvenation
US20100305495A1	2009-05-26	2010-12-02	The General Hospital Corporation	Method and apparatus for dermal delivery of a substance
US7857806B2	2005-07-14	2010-12-28	Boehringer Technologies, L.P.	Pump system for negative pressure wound therapy
WO2010151704A1	2009-06-24	2010-12-29	Carticept Medical, Inc.	Injection system for delivering multiple fluids within the anatomy
US7862564B2	2000-02-22	2011-01-04	Plasmogen Inc.	Method of remodelling stretch marks
WO2011006009A1	2009-07-08	2011-01-13	Edge Systems Corporation	Devices, systems and methods for treating the skin using time-release substances
US7901373B2	2004-01-08	2011-03-08	Tavtech Ltd.	High velocity liquid-gas mist tissue abrasion device
US20110060270A1	1997-12-30	2011-03-10	Eppstein Jonathan A	Microporation of Tissue for Delivery Of Bioactive Agents
US20110066162A1	2009-09-16	2011-03-17	Vandolay, Inc.	Cryo-micro-dermabrasion
US20110067761A1	2009-09-08	2011-03-24	Jayson King	Storage Tank Containment Apparatus
USD639164S1	2008-04-30	2011-06-07	Rexam Beverage Can Company	Container body
US7981111B2	2003-02-25	2011-07-19	Tria Beauty, Inc.	Method and apparatus for the treatment of benign pigmented lesions
US7981112B1	1997-08-12	2011-07-19	Joseph Neev	Home use device and methods for treating skin conditions
CA2784209A1	2010-01-29	2011-08-04	Kci Licensing, Inc.	Wound treatment apparatuses and methods for controlled delivery of fluids to a wound
US20110190726A1	2005-11-29	2011-08-04	Reliant Technologies, Inc.	Method and apparatus for micro-needle array electrode treatment of tissue
US7993333B2	2002-10-25	2011-08-09	The Regents Of The University Of Michigan	Ablation catheters
WO2011110840A1	2010-03-12	2011-09-15	Lrc Products Limited	Skin treating device
US8025669B1	2005-07-22	2011-09-27	Biorenew Labs, Llc	Portable microderm abrasion device
US20110251523A1	2010-04-08	2011-10-13	Elcos America, Inc.	Skin care apparatus and method of skin care using the same

US20110264028A1	2010-03-26	2011-10-27	Radhakrishnan Ramdas	Active transdermal drug delivery system and the method thereof
US8048064B2	2005-12-23	2011-11-01	Lutronic Corporation	Method of curing inflammatory acne by using carbon lotion and pulsed laser
US20110270137A1	2010-04-29	2011-11-03	Applisonix Ltd.	Method and system for treating skin tissue
US20110270364A1	2007-08-01	2011-11-03	Syneron Medical Ltd.	Method and device for collagen growth stimulation
US20110295273A1	2009-11-25	2011-12-01	Waldron Stephen H	Device for applying liquid skincare products in combination with vacuum and abrasion
US8088085B2	2005-06-03	2012-01-03	L'oreal	Massaging and/or dispensing device
US8105295B2	2004-04-28	2012-01-31	Smith & Nephew Plc	Dressing and apparatus for cleansing the wounds
US20120041338A1	2010-08-13	2012-02-16	Seventh Sense Biosystems, Inc.	Clinical and/or consumer techniques and devices
US20120041523A1	2009-04-22	2012-02-16	Radiancy Inc.	Skin treatment device utilizing light and temperature
US20120109043A1	2010-11-02	2012-05-03	Yuchen Zhou	Integrated skin-treatment specimen dispenser
US20120109041A1	2009-03-30	2012-05-03	Jutta Munz	Applicator device for cosmetic and/or medical use
US8182473B2	1999-01-08	2012-05-22	Palomar Medical Technologies	Cooling system for a photocosmetic device
US20120171636A1	2009-10-06	2012-07-05	Boaz Barry Groman	Pressure-Regulating Handheld Adapter for Dental Abrasive Blasting Device
US8226663B2	2010-09-22	2012-07-24	Irina Remsburg	Microdermabrasion hand piece providing automatic limitation of skin hyperextension
USD664254S1	2010-06-24	2012-07-24	Hitachi Medical Corporation	Monitor for x-ray apparatus
US8231292B2	2009-01-16	2012-07-31	The Procter & Gamble Company	Apparatus and methods for modifying keratinous surfaces
US8236036B1	2007-07-21	2012-08-07	Frost Ricky A	Optical dermatological and medical treatment apparatus having replaceable laser diodes
US8273080B2	2006-10-16	2012-09-25	Syneron Medical Ltd.	Methods and devices for treating tissue
US20120259252A1	2009-12-22	2012-10-11	Avon Products, Inc.	Coupling Emulsions for Use With Ultrasound Devices
WO2012145667A2	2011-04-21	2012-10-26	Sunless, Inc.	Hand held skin treatment spray apparatus and system
US20120289885A1	2011-05-14	2012-11-15	William Jude Cottrell	Phototherapy system
US8313480B2	2004-10-02	2012-11-20	Joseph Neev	Device and method for treating skin disorders with thermal energy
US8317781B2	2009-10-16	2012-11-27	Shaser, Inc.	Power supply for light-based dermatologic treatment device
US20120302929A1	2011-05-23	2012-11-29	Vitaly Tkachenko	Head mounted pulse action facial and head massager band
US8323253B2	2007-02-23	2012-12-04	Reliant Technologies, Inc.	Method and device for tightening tissue using electromagnetic radiation
US20130004230A1	2011-06-04	2013-01-03	Optmed, Inc.	Applicator
US20130018317A1	1997-02-05	2013-01-17	Medtronic Minimed, Inc.	Insertion Device for an Insertion Set and Method of Using the Same
USD676764S1	2007-06-08	2013-02-26	Silgan Containers Llc	Screw-top container
WO2013030117A2	2011-08-31	2013-03-07	Medic Activ Vertriebs Gmbh	Fluid cartridge and dispensation device
US8398621B2	2006-11-18	2013-03-19	Braun Gmbh	Device for treating the skin
USD678783S1	2012-03-08	2013-03-26	Leo Pharma A/S	Applicator for applying preparations to the skin
US20130085421A1	2011-09-30	2013-04-04	Ronald J. Gillespie	Method of applying heat using handheld device
US20130096546A1	2009-03-05	2013-04-18	Cynosure, Inc.	Non-uniform beam optical treatment methods and systems
USD680437S1	2011-08-29	2013-04-23	Noble Organic Holding B.V.	Bottle
US8430104B2	2001-08-21	2013-04-30	Cooltouch Incorporated	Method for treatment of microbial infection
US8435234B2	2007-02-06	2013-05-07	Reliant Technologies, Inc.	Method and apparatus for monitoring and controlling laser-induced tissue treatment

US20130144207A1	2010-05-27	2013-06-06	Nestis	Pulsed medium- and high-pressure liquid jet generator for medical and surgical uses
US20130144280A1	2009-12-06	2013-06-06	Shimon Eckhouse	Method and apparatus for personal skin treatment
US20130158547A1	2011-12-19	2013-06-20	Jonathan David	Fluid Skin Treatment Device
US8475507B2	2011-02-01	2013-07-02	Solta Medical, Inc.	Handheld apparatus for use by a non-physician consumer to fractionally resurface the skin of the consumer
US8478396B2	2010-06-09	2013-07-02	Forward Electronics Co., Ltd.	Phototherapy patch
US8496695B2	2006-12-15	2013-07-30	Korea Electro Technology Research Institute	Apparatus and method for photodynamic diagnosis and therapy of skin diseases and light source system thereof
US8496654B2	2009-07-20	2013-07-30	Syneron Medical Ltd.	Method and apparatus for fractional skin treatment
EP2618797A1	2010-09-22	2013-07-31	Sharon Hilditch	Device
US20130204238A1	2010-03-29	2013-08-08	Follica, Inc	Combination therapy
US20130226269A1	2010-10-17	2013-08-29	Syneron Medical Ltd	Disposable patch for personal aesthetic skin treatment
US8535299B2	2004-01-23	2013-09-17	Joseph Giovannoli	Method and apparatus for skin reduction
US8545419B2	2008-12-30	2013-10-01	K.I.C.A. Inc.	Multi-functional cosmetic device using ultrasonic wave
US20130261534A1	2006-09-28	2013-10-03	Puricore, Inc.	Apparatus and method for wound, cavity, and bone treatment
US8562626B2	2010-08-06	2013-10-22	MoMelan Technologies, Inc.	Devices for harvesting a skin graft
JP2013215621A	2007-01-22	2013-10-24	Corium Internatl Inc	Applicator for microneedle
US8573874B2	2009-06-04	2013-11-05	Elc Management, Llc	Metal clad ceramic cosmetic applicator
US20130317314A1	2012-07-30	2013-11-28	David Patrick Lampson	Vibrating Comedo Extractor with Light
US8597284B2	2009-06-03	2013-12-03	Biolitec Pharma Marketing, Ltd.	Cosmetic rejuvenation by photodynamic therapy
US20130345616A1	2012-06-26	2013-12-26	Franklin J. Chang	Skin Treatment Device
USD697404S1	2010-10-29	2014-01-14	Ball Corporation	Beverage container
US20140031801A1	2004-01-23	2014-01-30	Joseph Giovannoli	Method and apparatus for skin reduction
US20140079686A1	2010-12-06	2014-03-20	Shikha P. Barman	Methods For Treating Baldness And Promoting Hair Growth
US20140081251A1	2004-01-23	2014-03-20	Joseph Giovannoli	Method and aparatus for skin reduction
US8679039B2	2010-10-12	2014-03-25	La Pierres, Inc.	Ultrasonic device with integrated specimen dispenser
US20140094718A1	2008-03-07	2014-04-03	Stephen Feldman	System and method for tattoo removal
US8700176B2	2006-07-27	2014-04-15	Pollogen Ltd.	Apparatus and method for non-invasive treatment of skin tissue
US8702691B2	2005-10-19	2014-04-22	Thermage, Inc.	Treatment apparatus and methods for delivering energy at multiple selectable depths in tissue
US20140114234A1	2011-03-23	2014-04-24	Bruce K Redding, JR.	Systems and Methods for Enhancing the Delivery of Compounds to Skin Pores using Ultrasonic Waveforms
US20140135798A1	2012-11-13	2014-05-15	Jonathan David	Light therapy skin device
US8728064B2	2011-12-12	2014-05-20	Candela Corporation	Devices for the treatment of biological tissue
WO2014091035A1	2012-12-15	2014-06-19	Decaux Stéphane	Applicator and capsule for such applicator
USD709617S1	2012-12-28	2014-07-22	Danakim Investments Limited	Skin treatment apparatus
US20140234004A1	2013-02-19	2014-08-21	Hct Asia Ltd.	Applicator device or dispenser with applicator tip assembly
US8818500B2	2012-02-17	2014-08-26	Aptar France S.A.S.	Fluid dispenser
US20140243589A1	2013-02-26	2014-08-28	Kinkel Rowan	Disposable Vibratory Apparatus
US8821940B2	2010-08-27	2014-09-02	Sienna Labs, Inc.	Thermal treatment of the skin surface with nanoparticles
WO2014151104A1	2013-03-15	2014-09-25	Edge Systems Llc	Devices, systems and methods for treating the skin
US8858570B2	2012-07-19	2014-10-14	Henry Ping Chang	Skin treatment apparatus

US20140316492A1	2013-04-22	2014-10-23	BS and Co. Ltd.	Led phototherapy apparatus for skin
US20140378887A1	2012-06-26	2014-12-25	Franklin J. Chang	Skin Treatment Device
US8939669B2	2011-09-13	2015-01-27	Young Living Essential Oils, Lc	Roller-ball applicator assembly for topical oils application
USD722172S1	2012-11-30	2015-02-03	Ricoh Company, Ltd.	Medical cart
US20150039060A1	2010-12-21	2015-02-05	Koninklijke Philips Electronics N.V.	Wearable and breathable photo therapy patch
US8974442B1	2007-12-14	2015-03-10	William K. Boss, Jr.	Facial area rejuvenation
EP2865867A1	2013-10-28	2015-04-29	Delavan Inc.	Enhanced fire protection for fuel manifold
US20150141877A1	2008-03-07	2015-05-21	Inrexrem Inc.	Led and shockwave therapy for tattoo removal
US9044582B2	2012-06-26	2015-06-02	Franklin J. Chang	Apparatus and method for transdermal fluid delivery
US9050133B1	2009-12-22	2015-06-09	Envy Medical, Inc.	Skin treatment system with adjustable height wand
US9050156B2	2005-03-10	2015-06-09	Boaz Barry Groman	Sealing particulate matter in a micro-abrasive blasting device
US20150157496A1	2012-07-09	2015-06-11	Koninklijke Philips N.V.	Method and apparatus for treating a skin tissue
US9072533B2	2011-03-30	2015-07-07	Tria Beauty, Inc.	Dermatological treatment device with one or more multi-emitter laser diode
US9072521B2	2012-06-08	2015-07-07	Home Skinovations Ltd.	Non-invasive device for treating body tissue
USD734154S1	2011-03-02	2015-07-14	Ball Corporation	Beverage container
US20150202007A1	2012-08-10	2015-07-23	The General Hospital Corporation	Method and apparatus for dermatological treatment
US9149322B2	2003-03-31	2015-10-06	Edward Wells Knowlton	Method for treatment of tissue
US20150313993A1	2014-05-04	2015-11-05	Robert T. Bock	Ultrasonic Method and Device for Cosmetic Applications
USD743558S1	2012-02-03	2015-11-17	Samsung Electronics Co., Ltd.	Medical ultrasound system
USD743269S1	2013-12-13	2015-11-17	Bryan Papé	Growler with lid
US20150351868A1	2005-03-10	2015-12-10	Boaz Barry Groman	Sealing Particulate Matter in a Micro-Abrasive Blasting Device
US9227044B2	2013-12-09	2016-01-05	Amneal Pharmaceuticals Llc	Applicator for applying a fluid to a surface
US9233207B2	2011-02-22	2016-01-12	Tavtech Ltd.	Device for administering therapeutic substances using a high velocity liquid-gas stream
US20160015962A1	2014-07-16	2016-01-21	Mehdi Shokoueinejad Maragheh	Smart Patch For Wound Management
US20160018100A1	2007-03-05	2016-01-21	Micropyretics Heaters International, Inc.	Compact steamer
US9271755B2	2011-11-28	2016-03-01	Derma Dream Group Ltd.	Minutely controlled dermabrasion hand piece and a method for controlling thereof
US9278230B2	2009-02-25	2016-03-08	Syneron Medical Ltd	Electrical skin rejuvenation
US9283037B2	2005-04-18	2016-03-15	Pantec Biosolutions Ag	Laser microporator
WO2016052818A1	2014-09-30	2016-04-07	Lg Electronics Inc.	Dermal patch and method for skin rejuvenation
US9314302B2	2004-06-24	2016-04-19	Virulite Llc	Cosmetic uses of electromagnetic radiation
US9351794B2	2007-06-15	2016-05-31	Szymon Szymon Suckewer	Methods to alter damaged mammalian skin using a multiphoton processes
US20160175609A1	2014-12-23	2016-06-23	Catherine L. Dye	Multicolor light emitting diode treatment system with uniform illumination
US9375281B2	2009-07-20	2016-06-28	Koninklijke Philips N.V.	Light application apparatus for applying light to an object
WO2016106396A1	2014-12-23	2016-06-30	Edge Systems Llc	Devices and methods for treating the skin using a rollerball or a wicking member
US20160235257A1	2015-02-12	2016-08-18	Visibelle Derma Institute, Inc.	Tip for skin cleansing device
US20160250415A1	2013-07-09	2016-09-01	Nipro Corporation	Connector for fluid, and syringe
USD765512S1	2015-06-25	2016-09-06	Pierre Joulia	Dispenser of cosmetic products

US9440093B2	2003-10-14	2016-09-13	Gregg S. Homer	More dermal retraction with intersecting electromagnetic radiation pathways
US9452013B2	2004-04-01	2016-09-27	The General Hospital Corporation	Apparatus for dermatological treatment using chromophores
US20160287333A1	2012-11-19	2016-10-06	Sagentia Limited	Hand held treatment device
US9480836B2	2011-06-14	2016-11-01	Jongju Na	Skin treatment apparatus and method
USD772481S1	2015-12-07	2016-11-22	Intel Plastics Inc.	Applicator
WO2017007939A1	2015-07-08	2017-01-12	Edge Systems LLC	Devices, systems and methods for promoting hair growth
US9566088B2	2006-03-29	2017-02-14	Edge Systems LLC	Devices, systems and methods for treating the skin
US9566454B2	2006-09-18	2017-02-14	Guided Therapy Systems, LLC	Method and sysem for non-ablative acne treatment and prevention
US20170043150A1	2015-08-13	2017-02-16	Seoulin Medi Care Co., Ltd.	Skin care device
US9572880B2	2010-08-27	2017-02-21	Sienna Biopharmaceuticals, Inc.	Ultrasound delivery of nanoparticles
US20170065829A1	2015-09-09	2017-03-09	Cal-Comp Electronics & Communications Company Limited	Skin treatment device
US9597527B2	2010-07-17	2017-03-21	Merck Patent GmbH	Enhancement of penetration and action
USD782881S1	2015-10-30	2017-04-04	Yeti Coolers, LLC	Bottle
US20170106206A1	2005-10-12	2017-04-20	Brooke R. Seckel	Method for non-surgical facial rejuvenation
US9636522B2	2010-08-11	2017-05-02	Koninklijke Philips N.V.	Phototherapy method and device
US9636521B2	2013-07-12	2017-05-02	Jonathan Isserow	Heat and light treatment device using nanotechnology
US20170128319A1	2014-06-16	2017-05-11	Inderm	Applicator and Cartridge for Such Applicator
USD787054S1	2016-04-14	2017-05-16	Becton, Dickinson And Company	Pen needle hub
US9669233B2	2013-11-11	2017-06-06	Thermotek, Inc.	Method and system for wound care
US20170157419A1	2014-07-09	2017-06-08	Industrial Cooperation Foundation Chonbuk National University	Cancer cell growth inhibition and killing device using blue light led
US9675817B2	2013-01-23	2017-06-13	Jonathan Isserow	Heating device using exothermic chemical reaction
WO2017111481A1	2015-12-22	2017-06-29	(주)아모레퍼시픽	Massaging device having a lifting function for skin
US9700684B2	2013-08-13	2017-07-11	Preventamedics LLC	Medical delivery devices and methods for applying a barrier composition to a targeted skin surface
US20170196759A1	2016-01-07	2017-07-13	Hld Healthy Life Devices Oy	Arrangement in connection with low pressure suction apparatus
JP1581877S	2016-04-08	2017-07-24		
US20170209894A1	2016-01-25	2017-07-27	Porex Corporation	Multicomponent sintered porous liquid applicator nibs
US9731053B2	2012-04-13	2017-08-15	Nili Alai	Vacubrasion: universal air flow regulator and attachment for vacuum assisted microdermabrasion
US9744315B1	2016-11-28	2017-08-29	Heat In A Click LLC	Skin treatment apparatus
US20170252105A1	2007-04-19	2017-09-07	Mark E. Deem	Methods and apparatus for reducing sweat production
EP3217899A1	2014-11-14	2017-09-20	Cytrellis Biosystems, Inc.	Devices and methods for ablation of the skin
US9775645B2	2013-03-01	2017-10-03	Envy Medical, Inc.	Microdermabrasion system with ergonomic handle
US9775976B2	2013-12-17	2017-10-03	L'oreal	Skin cleansing apparatus with oscillation motion converter
US20170291007A1	2016-04-06	2017-10-12	Sonusmed, Incorporated	Therapeutic Vibration System
US9814647B2	2014-03-13	2017-11-14	Panasonic Intellectual Property Management Co., Ltd.	Massage apparatus and massage method
US9814485B2	2013-12-31	2017-11-14	Kci Licensing, Inc.	Hydraulically actuated skin graft harvesting
US20170343308A1	2016-05-24	2017-11-30	Nlb Corp.	Cleaning system and method
US20170340356A1	2016-05-25	2017-11-30	Presser Direct, LLC	Vented tip for fixed-abrasive microdermabrasion with vacuum-assisted debris removal

US9861442B2	2013-03-15	2018-01-09	Nikolai Tankovich	Laser filler
US20180008500A1	2012-07-06	2018-01-11	The General Hospital Corporation	Method and apparatus for dermatological treatment
USD811381S1	2016-03-09	2018-02-27	Ricoh Company, Ltd.	Terminal
USD811225S1	2015-12-18	2018-02-27	Louis Vuitton Malletier	Perfume bottle
EP3302319A1	2015-06-03	2018-04-11	Koninklijke Philips N.V.	Microdermabrasion device with skin dome measurement to adjust vacuum setting
US9950147B2	2014-09-12	2018-04-24	Je Matadi, Inc.	Apparatus and method for administering a skin care composition
US9949552B2	2014-07-25	2018-04-24	The Procter & Gamble Company	Handheld treatment apparatus for modifying keratinous surfaces
US9955769B2	2014-07-25	2018-05-01	The Procter & Gamble Company	Applicator heads for handheld treatment apparatus for modifying keratinous surfaces
US9962220B2	2014-04-27	2018-05-08	Lumenis Ltd.	Modular aesthetic treatment handpiece
US9968800B2	2016-02-09	2018-05-15	Luma Therapeutics, Inc.	Methods, compositions and apparatuses for treating psoriasis by phototherapy
US10004919B2	2012-07-03	2018-06-26	Koninklijke Philips N.V.	Phototherapy patch with increased thermal insulation
US10010445B2	2013-01-23	2018-07-03	Jonathan Isserow	Treatment device using nanotechnology
EP3340908A1	2015-08-26	2018-07-04	Koninklijke Philips N.V.	Skin-abrading surface that releases agents to the skin
US20180185675A1	2016-12-15	2018-07-05	Nse Products, Inc.	Device and methods for topical application of fluids to skin
USD822845S1	2016-03-28	2018-07-10	Olympus Corporation	Medical cleaning and disinfection apparatus
JP1609357S	2017-03-30	2018-07-17		
US10022289B2	2014-01-31	2018-07-17	Panasonic Intellectual Property Management Co., Ltd.	Massaging apparatus and massage method
USD825763S1	2016-11-22	2018-08-14	Samsung Medison Co., Ltd.	Ultrasound diagnostic unit
US10076354B2	2010-12-17	2018-09-18	Srgi Holdings, LLC	Pixel array medical devices and methods
US10076646B2	2015-05-22	2018-09-18	L'oreal	Rolling applicator for treating skin conditions
US10092478B1	2017-09-06	2018-10-09	Noah Amit	Method and system for treating skin associated with the face and neck
US10105191B2	2014-03-04	2018-10-23	Pulse Biosciences, Inc.	Marking tissue surfaces for treatment of lesions by electrical nanopulses
US20180310979A1	2015-11-13	2018-11-01	Omer Peled	Method and apparatus for use of ice crystals in aesthetic and cosmetic procedures
USD833283S1	2016-02-11	2018-11-13	Fragrance And Skincare S.L.	Perfume bottle
US10149984B2	2011-02-11	2018-12-11	El.En. S.P.A.	Device and method for skin laser treatment
US10149969B2	2014-09-25	2018-12-11	L'oréal	Skin treatment appliance with changeable workpiece
USD836781S1	2017-04-28	2018-12-25	General Electric Company	Monitor and cabinet in combination
US10172644B2	2006-03-29	2019-01-08	Edge Systems LLC	Devices, systems and methods for treating the skin
US20190009110A1	2017-07-06	2019-01-10	Slender Medical Ltd.	Ultrasound energy applicator
US20190009111A1	2017-06-08	2019-01-10	Gunnar Myhr	Non-invasive and optimized system for the rejuvenation and removal of wrinkles of the skin
US10179229B2	2014-12-23	2019-01-15	Edge Systems LLC	Devices and methods for treating the skin using a porous member
US10183183B2	2007-04-13	2019-01-22	Acoustic Medsystems, Inc.	Acoustic applicators for controlled thermal modification of tissue
US10188193B2	2014-07-25	2019-01-29	The Procter & Gamble Company	Applicator heads for handheld treatment apparatus for modifying keratinous surfaces
US10207034B2	2008-12-31	2019-02-19	Kci Licensing, Inc.	Sleeves, manifolds, systems, and methods for applying reduced pressure to a subcutaneous tissue site
US10220122B2	2007-10-09	2019-03-05	Ulthera, Inc.	System for tissue dissection and aspiration

US20190070069A1	2016-10-14	2019-03-07	Olympic Ophthalmics, Inc.	Quiet handheld devices and methods for treatment of disorders
US20190076193A1	2010-02-04	2019-03-14	El. En. S.P.A.	Device and method for treating the epidermis
US20190083161A1	2017-09-20	2019-03-21	Fourth State Medicine Ltd.	Control of thermal plasma generation
US10238812B2	2013-03-15	2019-03-26	Edge Systems Llc	Skin treatment systems and methods using needles
US10238849B2	2009-07-30	2019-03-26	Alma Lasers Ltd.	Sonotrode
US10252044B2	2015-02-27	2019-04-09	Robert T. Bock Consultancy, Llc	Ultrasonic method and device for cosmetic applications
US10271900B2	2007-04-06	2019-04-30	Rocky Mountain Biosystems, Inc	Inductive heating of tissues using alternating magnetic fields and uses thereof
US20190151637A1	2017-11-17	2019-05-23	Esthetic Education LLC	Sterile Applicator Assembly
US10307330B1	2017-11-16	2019-06-04	Filip Sedic	Skincare devices and methods of use
US10308378B2	2011-07-11	2019-06-04	Life Technologies Corporation	Fluid manifold systems
US10314378B2	2014-07-25	2019-06-11	The Procter & Gamble Company	Cartridge assembly for a dispensing device
US10321948B2	2010-12-17	2019-06-18	Srgi Holdings, Llc	Pixel array medical devices and methods
USD851759S1	2018-01-17	2019-06-18	Site Saver, Inc.	Breakaway connector for medical lines
US20190183562A1	2017-12-15	2019-06-20	Life Care Medical Devices Limited	Skin wrinkle treatment
USD852962S1	2015-09-09	2019-07-02	Canon Medical Systems Corporation	Ultrasonic diagnosis apparatus
US10369073B2	2014-08-22	2019-08-06	Luis del Rosario	Skin treatment apparatus and parts thereof
US20190239939A1	2018-02-07	2019-08-08	Cynosure, Inc.	Methods and apparatus for controlled rf treatments and rf generator system
US20190257320A1	2018-02-22	2019-08-22	Ksb Sas	Finger pump
US20190274759A1	2016-07-22	2019-09-12	Universite de Bordeaux	Dermatological diagnosis and treatment system
US20190275320A1	2016-11-08	2019-09-12	Massachusetts Institute Of Technology	Systems and methods of facial treatment and strain sensing
US10413359B2	2013-07-18	2019-09-17	International Business Machines Corporation	Laser-assisted transdermal delivery of nanoparticulates and hydrogels
USD861913S1	2017-04-20	2019-10-01	Biomerieux, Inc.	Fluid testing device
US10456321B2	2015-08-25	2019-10-29	John H. Shaddock	Fluid skin treatment systems and methods
US10456567B2	2016-06-30	2019-10-29	L'oreal	Topical cooled dermal device
US10463429B2	2007-04-19	2019-11-05	Miradry, Inc.	Methods, devices, and systems for non-invasive delivery of microwave therapy
US10471274B2	2013-01-30	2019-11-12	Channel Investments, Llc	Pulse width modulation control for battery-powered laser device
USD867587S1	2016-08-29	2019-11-19	Medela Holding Ag	Safety valve component for a breastmilk collection system
USD868981S1	2017-12-14	2019-12-03	Respiderm Corporation	Humidification apparatus
US20190366067A1	2016-09-21	2019-12-05	Cytrellis Biosystems, Inc.	Devices and methods for cosmetic skin resurfacing
US10524835B2	2017-04-25	2020-01-07	John H. Shaddock	Fluid skin treatment systems and methods
USD873430S1	2017-07-13	2020-01-21	Lin Zhou	Bio-spectrum therapeutic apparatus
USD873481S1	2018-05-15	2020-01-21	Dastmalchi LLC	Applicator stick
US10537304B2	2008-06-06	2020-01-21	Ulthera, Inc.	Hand wand for ultrasonic cosmetic treatment and imaging
US20200030627A1	2018-07-26	2020-01-30	Azulite, Inc.	Adhesive phototherapy method, system, and devices for acne
US10583037B2	2013-01-23	2020-03-10	Transqtrionics, Llc.	Heating device using exothermic chemical reaction
US20200101312A1	2018-09-29	2020-04-02	Gcsol Tech Co., Ltd.	Phototherapy device
US20200114116A1	2016-04-06	2020-04-16	Sonusmed, Incorporated	Therapeutic vibration system

US20200121354A1	2013-08-09	2020-04-23	Cytrellis Biosystems, Inc.	Methods and apparatuses for skin treatment using non-thermal tissue ablation
USD886372S1	2018-12-21	2020-06-02	Elc Management Llc	Combined cosmetic jar and cap
USD886370S1	2017-10-03	2020-06-02	Cosmogen Sas	Cosmetic applicator
US10675481B1	2019-08-20	2020-06-09	Nikolai Tankovich	Laser system for multiple beam tissue therapy
US20200179220A1	2018-12-10	2020-06-11	JJJ Health LLC	Cupping device and method for facial and skin treatment
USD887571S1	2019-11-01	2020-06-16	Dongguan Lescolton Intelligent Electrical Appliance Co., Ltd	Photon beauty instrument
US10688290B1	2019-05-30	2020-06-23	Dead Sea Premier Cosmetics Laboratories Ltd.	Personal anti-wrinkle device
US20200206072A1	2016-03-23	2020-07-02	Soliton, Inc.	Pulsed acoustic wave dermal clearing system and method
US10702328B2	2013-12-18	2020-07-07	Novoxel Ltd.	Devices and methods for tissue vaporization
US10716924B2	2010-12-17	2020-07-21	Srgi Holdings, Llc	Systems, devices and methods for fractional resection, fractional skin grafting, fractional scar reduction and fractional tattoo removal
US10736653B2	2013-12-06	2020-08-11	Srgi Holdings, Llc	Pixel array medical systems, devices and methods
USD893024S1	2018-10-01	2020-08-11	Hf Scientific, Inc.	Cap for a solution bag
US10737080B2	2015-05-19	2020-08-11	Miisha Patterson	Scalp treatment tool
US20200254273A1	2019-02-07	2020-08-13	Weinberg Medical Physics, Inc.	System, methodologies and components for skin sculpting with magnetic particles
US10758261B2	2016-11-23	2020-09-01	LCL Enterprises, Inc.	Microdermabrasion systems and related technologies
US10772658B2	2010-12-17	2020-09-15	Srgi Holdings, Llc	Pixel array medical systems, devices and methods
US20200288843A1	2019-03-14	2020-09-17	Johann Verheem	Device for Treating Human Skin, Hair and Nails
US20200289161A1	2019-03-13	2020-09-17	Fka Distributing Co., Llc	Skin treatment apparatus with cooling member
US20200306555A1	2019-04-01	2020-10-01	John Oscar Alexander Ebbesson	Compact Portable Body Tanning and Light Therapy Apparatus
US10792382B2	2018-04-27	2020-10-06	KleanTouch LLC	Distribution manifold with integrated check valve
US20200316270A1	2019-04-07	2020-10-08	Light tree	Skin Treatment Device for Balancing pH Value of Skin
US10799430B2	2016-07-25	2020-10-13	Med-Aesthetic Solutions, Inc.	Positive pressure flow skin abrasion system and method for dermal rejuvenation
US20200330754A1	2017-11-15	2020-10-22	Lg Electronics Inc.	Skin care device
US10813694B2	2012-04-02	2020-10-27	Koninklijke Philips N.V.	Light based skin treatment device avoiding LIOB in air
US20200338586A1	2016-02-18	2020-10-29	Daonic Co., Ltd.	Handpiece of skin care device
US20200367961A1	2018-02-16	2020-11-26	Exploramed V Llc	Acne treatment system and methods
US10850095B2	2017-08-08	2020-12-01	Pulse Biosciences, Inc.	Treatment of tissue by the application of energy
US10860026B2	2015-06-29	2020-12-08	The Boeing Company	Mobile robotic system for guiding an automated vehicle along a reconfigurable path and method thereof
US20200390468A1	2019-06-14	2020-12-17	Age Sciences, Inc. DbA Pmd Beauty	Abrasive skin care appliances
US10874579B1	2015-03-11	2020-12-29	Reginald Rembert	Wearable massager
US20210001148A1	2019-03-14	2021-01-07	Johann Verheem	Light treatment device
GB2585500A	2019-06-27	2021-01-13	Tube Tech International Ltd	Tube cleaning Robot
US10893907B2	2015-08-11	2021-01-19	You In KIM	Medical skin wrinkle improvement device using peak of laser pulse wave
USD908282S1	2019-05-10	2021-01-19	Yonwoo Co., Ltd.	Container for cosmetics
W02021018765A1	2019-07-26	2021-02-04	L'oreal	Cosmetic product dispensing pipette comprising a ball receiving insert, and associated device and method
US10918190B2	2019-01-25	2021-02-16	Kim A. Laudati	Rose quartz and/or jade multi-roller applicator and container apparatus

US20210052292A1	2019-08-19	2021-02-25	Zlasers Ltd.	Laser shockwave system and method
US10946191B2	2013-12-20	2021-03-16	L'oreal	Iontophoretic device having a reservoir
US10952907B1	2017-02-18	2021-03-23	Tag Off LLC	Acrochordon excising bandage
US10980592B2	2012-07-09	2021-04-20	Koninklijke Philips N.V.	Skin treatment method and apparatus
USD917290S1	2019-12-31	2021-04-27	Billie, Inc.	Bottle
US20210154093A1	2008-08-22	2021-05-27	Envy Medical, Inc.	Microdermabrasion System with Combination Skin Therapies
WO2021113343A1	2019-12-03	2021-06-10	Sorrento Therapeutics, Inc.	Fluid delivery apparatus with microneedles
US20210220631A1	2020-01-21	2021-07-22	Korea Institute Of Science And Technology	Phototherapeutic needle patches and methods of manufacturing the same
USD927008S1	2020-02-19	2021-08-03	Marci Beauty, LLC	Light-emitting beauty device
US20210242657A1	2019-05-03	2021-08-05	Jeisys Medical Inc.	Laser device for skin treatment
US20210236836A1	2016-05-10	2021-08-05	Btl Medical Technologies S.R.O.	Aesthetic method of biological structure treatment by magnetic field
US20210236342A1	2017-10-24	2021-08-05	Kci Licensing, Inc.	Wound Dressings and Systems with Low-Flow Therapeutic Gas Sources for Topical Wound Therapy and Related Methods
US11083515B2	2013-12-18	2021-08-10	Novoxel Ltd.	Methods and devices for thermal tissue vaporization and compression
USD928977S1	2020-02-06	2021-08-24	Light Tree Ventures Holding B.V.	LED acne treatment device
US20210259914A1	2020-02-21	2021-08-26	Omega Dolor Inc.	Systems and methods for pain management
US20210268304A1	2020-03-02	2021-09-02	Cellbiokorea Co., Ltd	Spontaneous emission type photo conversion substance for light therapy, and the functional patch and functional mask pack comprising the same
US20210267625A1	2020-02-28	2021-09-02	Tag Off LLC	Skin Growth Excision Apparatus
US20210275406A1	2016-07-25	2021-09-09	Allan Danto	System and method for treating skin and areas proximate thereto
US20210282855A1	2017-05-19	2021-09-16	Sciton. Inc	System and methods for treating skin
US20210283421A1	2020-03-11	2021-09-16	EVORAY Co., Ltd.	Ultra-compact phototherapy apparatus for treating skin disease and healing wounds
TWD214226S	2020-12-31	2021-09-21	實力旺健康科技股份有限公司	Phototherapy machine
US20210290430A1	2018-03-08	2021-09-23	Recensmedical, Inc.	Cooling apparatus and cooling method
US11141761B2	2017-04-25	2021-10-12	9485562 Canada Inc.	Endoscope cleaning station having leak tester and high-pressure port
US11154723B2	2016-11-22	2021-10-26	Wellscare Co., Ltd	Laser patch and laser patch procedure set including same
US20210330356A1	2020-04-12	2021-10-28	Image Derm, Inc.	Device for fluid treatment of the skin
US11172978B2	2018-10-23	2021-11-16	Aesthetics Biomedical, Inc.	Methods, devices and systems for inducing collagen regeneration
US20210361525A1	2020-05-25	2021-11-25	Electronics And Telecommunications Research Institute	Vibratory stimulation device and vibratory stimulation system including the same
US20210370049A1	2018-01-16	2021-12-02	Pulse Biosciences, Inc.	Treatment tip with protected electrodes
US20210370089A1	2018-02-24	2021-12-02	Clearskin Ltd.	Compositions, devices, systems, kits and methods for the treatment of a skin condition
US20210393974A1	2018-10-15	2021-12-23	Massachusetts Institute Of Technology	Led therapy mask
US20210395071A1	2017-11-14	2021-12-23	Sartorius Stedim North America Inc.	System for Simultaneous Distribution of Fluid to Multiple Vessels and Method of Using the Same
US20210393975A1	2018-07-26	2021-12-23	Azuite, Inc.	Adhesive phototherapy method, system, and devices
US20210393478A1	2017-10-18	2021-12-23	Raja Bhatti	Hand-attached controlled eccentric vibration device
US20210402208A1	2020-06-30	2021-12-30	Johnson & Johnson Consumer Inc.	Device and method for controlling treatment for a skin condition using a tracer

US20220001199A1	2020-07-01	2022-01-06	Braun Gmbh	Skin treatment device
US20220008122A1	2018-10-10	2022-01-13	Pulse Biosciences, Inc.	Treatment of dermal glands by the application of non-thermal energy
US20220032082A1	2018-05-15	2022-02-03	Omm Imports, Inc.	Disposable product cap and assembly having a manually usable thermo-optical device for skin care
US11247039B2	2016-05-03	2022-02-15	Btl Healthcare Technologies A.S.	Device including RF source of energy and vacuum system
US20220054189A1	2019-05-02	2022-02-24	Aesthetics Biomedical, Inc.	Uniform diffusion of radiofrequency heating by electrode array
US20220072332A1	2019-01-17	2022-03-10	Amosense Co., Ltd	Patch-type skincare device
US20220071491A1	2019-03-21	2022-03-10	Seoul Viosys Co., Ltd.	Light irradiation device
US11278101B2	2017-03-09	2022-03-22	Aptar France Sas	Fluid product dispensing and application assembly
US20220087891A1	2020-09-23	2022-03-24	Modii Health Inc.	Systems And Methods For Multi Modal Personalized Topical Pain Relief
US11291474B2	2020-01-06	2022-04-05	Ed F. Nicolas	Skin treatment tool applicator tip
US20220111198A1	2020-10-08	2022-04-14	ROOTONIX Co.,Ltd.	Iontophoresis-based patch type skin care device
US20220117632A1	2020-10-20	2022-04-21	Altair Instruments, Inc.	Multifunction microdermabrasion wand
US20220126014A1	2019-02-04	2022-04-28	The Regents Of The University Of Michigan	Device and method for wound irrigation and debridement
US20220125706A1	2020-10-28	2022-04-28	Low Impact, LLC	Microstructured Textile with Microencapsulated Compounds
US20220133407A1	2016-12-23	2022-05-05	The General Hospital Corporation	Method and apparatus for selective treatment of biological tissue
WO2022099318A1	2020-11-09	2022-05-12	Edge Systems Llc	Devices, systems and methods for treating the skin
US11337755B2	2016-05-24	2022-05-24	Bangor University	Skin treatment apparatus
US11337745B2	2018-05-29	2022-05-24	Ilooda Co., Ltd.	Device for treatment of acne and control method of the same
US11351063B2	2017-06-07	2022-06-07	Kci Licensing, Inc.	Composite dressings for improved granulation and reduced maceration with negative-pressure treatment
US20220176092A1	2019-04-25	2022-06-09	Cosmed Pharmaceutical Co., Ltd.	Applicator 2 of water-soluble sheet-like formulation
US20220203112A1	2008-06-29	2022-06-30	Venus Concept Inc.	Esthetic apparatus useful for increasing skin rejuvenation and methods thereof
US20220218562A1	2019-04-03	2022-07-14	Soliton, Inc.	Systems, devices, and methods of treating tissue and cellulite by non-invasive acoustic subcision
US20220226668A1	2019-05-30	2022-07-21	Amolifescience Co., Ltd.	Led patch for skin care apparatus and skin care apparatus including the same
US20220233400A1	2019-05-17	2022-07-28	Lg Innotek Co., Ltd	Mask, and skin care apparatus comprising same
US20220241146A1	2019-06-14	2022-08-04	Amosense Co., Ltd.	Facial mask for skin care
US20220241107A1	2019-06-14	2022-08-04	Amolifescience Co., Ltd.	Heating patch for skin care
US20220268536A1	2019-06-27	2022-08-25	Tube Tech International Limited	Tube cleaning robot
US11452852B2	2017-03-28	2022-09-27	Cosmed Pharmaceutical Co., Ltd.	Applicator for water-soluble sheet-shaped preparation
US20220312940A1	2019-06-14	2022-10-06	Lg Innotek Co., Ltd.	Mask and skin care device including same
US11497553B2	2015-01-03	2022-11-15	Lenicura Gmbh	Device and/or method for treating diseases of the skin, glands, mucosae, connective tissue, nerves and/or horny tissue
US20220362529A1	2021-05-12	2022-11-17	CARISMED Corporation	Multi-modality skin treatment device
US11504148B2	2018-07-12	2022-11-22	Michael Todd Beauty Lp	Personal care appliance
US20220409276A1	2020-02-28	2022-12-29	Lameditech Co., Ltd.	Laser irradiation device
US11540882B2	2016-03-04	2023-01-03	El.En. S.P.A.	Delivery device with coaxial cable, apparatus comprising said device and method
US20230014299A1	2021-06-04	2023-01-19	John B. Lee, Jr.	Systems and methods for laser treatment of a dermatologic condition

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US11590345B2	2017-08-08	2023-02-28	Pulse Biosciences, Inc.	Treatment of tissue by the application of energy
US20230062185A1	2021-09-02	2023-03-02	Therabody, Inc.	Mask with vibration and light therapy
WO2023039524A1	2021-09-10	2023-03-16	Hydrafacial Llc	Devices, systems and methods for treating the skin
US20230104221A1	2021-10-06	2023-04-06	Oren Aharon	Rejuvenating laser drilling apparatus
WO2023064718A1	2021-10-11	2023-04-20	Hydrafacial Llc	Devices, systems and methods for treating the skin
US20230123145A1	2021-10-15	2023-04-20	Lutronic Corporation	Treatment apparatus using rf energy, control method thereof, and treatment method using the same
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USD568473S1	2006-05-24	2008-05-06	The Procter & Gambee Company	Skin care device
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US12161830B2	2008-01-29	2024-12-10	Hydrafacial LLC	Devices, systems, and methods for treating the skin
USD1065551S1	2021-09-10	2025-03-04	Hydrafacial LLC	Skin treatment device
US12295618B2	2020-01-06	2025-05-13	Hydrafacial LLC	Skin treatment tool applicator tip
USD1084369S1	2023-02-10	2025-07-15	Hydrafacial LLC	Skin treatment tip
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ES2395454T3 *	2008-01-17	2013-02-12	Syneron Medical Ltd.	A device for hair removal for personal use and the method of use thereof
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US9414889B2 *	2009-09-04	2016-08-16	Restoration Robotics, Inc.	Follicular unit harvesting tool
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US9775645B2	2013-03-01	2017-10-03	Envy Medical, Inc.	Microdermabrasion system with ergonomic handle
EP3903704B1	2013-03-15	2022-11-02	HydraFacial LLC	Devices and systems for treating the skin
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US9750533B2 *	2013-04-12	2017-09-05	L'oreal	Exfoliating head for a personal care appliance

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WO2014207750A1 *	2013-06-28	2014-12-31	Yosef Gross International Technologies Ltd.	Skin-care system
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AU2015346003A1 *	2014-11-12	2017-05-25	Mupharma Pty Ltd	Non-invasive agent applicator
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JP7458653B2	2018-07-23	2024-04-01	リベル・エッセティクス・インコーポレイテッド	Cellulite treatment system and method
WO2020163343A1	2019-02-04	2020-08-13	The Regents Of The University Of Michigan	Device and method for wound irrigation and debridement
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MX2024003011A *	2021-09-10	2024-05-10	Hydrafacial Llc	DEVICES, SYSTEMS AND METHODS FOR TREATING THE SKIN.
USD1016615S1	2021-09-10	2024-03-05	Hydrafacial Llc	Container for a skin treatment device
MX2024004390A *	2021-10-11	2024-06-19	Hydrafacial Llc	DEVICES, SYSTEMS AND METHODS FOR TREATING THE SKIN.
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KR20250007521A *	2022-03-31	2025-01-14	주식회사 리센스메디컬	Applicator tip with bevel for cooling device
USD1023311S1 *	2022-09-12	2024-04-16	Ge Qu	Ultrasound machine
PL442613A1 *	2022-10-22	2024-04-29	Matuszak Michal Venus	Multifunctional cosmetic device and a method of guiding by presenting animated information enabling self-service
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US12471954B2	2023-02-28	2025-11-18	Access Business Group International Llc	Handheld skin treatment device
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USD1039711S1	2023-02-28	2024-08-20	Access Business Group International Llc	Skin treatment device
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US20220362529A1	2022-11-17	Multi-modality skin treatment device
TWI637707B	2018-10-11	Positive pressure skin exfoliation system
US10556096B2	2020-02-11	Devices and methods for skin treatment
US12201704B2	2025-01-21	System and method for treating skin and areas proximate thereto
US6264666B1	2001-07-24	Water jet for dermatological treatment
US20050037034A1	2005-02-17	Method, apparatus, and composition for treating acne
US20010049511A1	2001-12-06	Water jet for dermatological treatment
US11786438B2	2023-10-17	Universal facial rejuvenation treatment system (U-FRTS)
US20230329739A1	2023-10-19	Device and Method for Skin Treatment
HK1094675A	2007-04-04	Method, apparatus, and composition for treating acne

Priority And Related Applications

Parent Applications (1)

Application	Priority date	Filing date	Relation	Title
US17/165,820	2005-12-30	2021-02-02	Continuation	Devices and methods for treating skin

Child Applications (1)

Application	Priority date	Filing date	Relation	Title
US18/487,916	2005-12-30	2023-10-16	Continuation	Devices and methods for treating skin

Priority Applications (3)

Application	Priority date	Filing date	Title
US18/094,884	2005-12-30	2023-01-09	Devices and methods for treating skin
US18/487,916	2005-12-30	2023-10-16	Devices and methods for treating skin
US18/638,470	2005-12-30	2024-04-17	Devices and methods for treating skin

Applications Claiming Priority (12)

Application	Filing date	Title
US75531005P	2005-12-30	
US76466806P	2006-02-02	
US11/392,348	2006-03-29	Apparatus and methods for treating the skin
US13/267,554	2011-10-06	Removable tips for skin treatment systems
US14/698,673	2015-04-28	Console system for the treatment of skin

US14/698,713	2015-04-28	Methods and systems for extraction of materials from skin
US14/700,789	2015-04-30	Tip with embedded materials for skin treatment
US15/660,777	2017-07-26	Removable tips for use with skin treatment systems
US15/660,750	2017-07-26	Tips for skin treatment device
US16/517,268	2019-07-19	Devices and methods for treating skin
US17/165,820	2021-02-02	Devices and methods for treating skin
US18/094,884	2023-01-09	Devices and methods for treating skin

Legal Events

Date	Code	Title	Description
2023-01-09	FEPP	Fee payment procedure	Free format text: ENTITY STATUS SET TO UNDISCOUNTED (ORIGINAL EVENT CODE: BIG.); ENTITY STATUS OF PATENT OWNER: LARGE ENTITY
2023-02-15	STPP	Information on status: patent application and granting procedure in general	Free format text: DOCKETED NEW CASE - READY FOR EXAMINATION
2023-10-06	STPP	Information on status: patent application and granting procedure in general	Free format text: NON FINAL ACTION MAILED
2023-10-17	STPP	Information on status: patent application and granting procedure in general	Free format text: RESPONSE TO NON-FINAL OFFICE ACTION ENTERED AND FORWARDED TO EXAMINER
2023-10-24	STPP	Information on status: patent application and granting procedure in general	Free format text: NOTICE OF ALLOWANCE MAILED -- APPLICATION RECEIVED IN OFFICE OF PUBLICATIONS
2023-10-30	AS	Assignment	Owner name: EDGE SYSTEMS CORPORATION, CALIFORNIA Free format text: ASSIGNMENT OF ASSIGNORS INTEREST;ASSIGNORS:IGNON, ROGER;MALLET, SCOTT;SOLANO, ABRAHAM;AND OTHERS;SIGNING DATES FROM 20060510 TO 20060628;REEL/FRAME:065391/0256
2023-10-31	AS	Assignment	Owner name: EDGE SYSTEMS LLC, CALIFORNIA Free format text: CHANGE OF NAME;ASSIGNOR:EDGE SYSTEMS CORPORATION;REEL/FRAME:065414/0064 Effective date: 20121127
2023-10-31	STPP	Information on status: patent application and granting procedure in general	Free format text: PUBLICATIONS -- ISSUE FEE PAYMENT RECEIVED
2023-11-01	AS	Assignment	Owner name: HYDRAFACIAL LLC, CALIFORNIA Free format text: CHANGE OF NAME;ASSIGNOR:EDGE SYSTEMS LLC;REEL/FRAME:065425/0416 Effective date: 20220324
2023-11-10	STPP	Information on status: patent application and granting procedure in general	Free format text: PUBLICATIONS -- ISSUE FEE PAYMENT VERIFIED
2023-12-20	STCF	Information on status: patent grant	Free format text: PATENTED CASE
2024-03-28	FEPP	Fee payment procedure	Free format text: PETITION RELATED TO MAINTENANCE FEES GRANTED (ORIGINAL EVENT CODE: PTGR); ENTITY STATUS OF PATENT OWNER: LARGE ENTITY
2024-04-19	FEPP	Fee payment procedure	Free format text: PETITION RELATED TO MAINTENANCE FEES GRANTED (ORIGINAL EVENT CODE: PTGR); ENTITY STATUS OF PATENT OWNER: LARGE ENTITY
2024-05-14	CC	Certificate of correction	

2024-11-12	IPR	Aia trial proceeding filed before the patent and appeal board: inter partes review	Free format text: TRIAL NO: IPR2024-01491 Opponent name: EUNSUNG GLOBAL CORP. Effective date: 20240930
2025-01-07	IPR	Aia trial proceeding filed before the patent and appeal board: inter partes review	Free format text: TRIAL NO: IPR2025-00145 Opponent name: SINCLAIR PHARMA LIMITED, SINCLAIR PHARMA US, INC., VIORA, INC., EMA AESTHETICS, LTD., AESTHETIC MANAGEMENT PARTNERS, LLC AND AESTHETIC MANAGEMENT PARTNERS, INC. Effective date: 20241125
2025-05-30	AS	Assignment	Owner name: U.S. BANK TRUST COMPANY, NATIONAL ASSOCIATION, AS COLLATERAL AGENT, CALIFORNIA Free format text: PATENT SECURITY AGREEMENT;ASSIGNOR:HYDRAFACIAL LLC;REEL/FRAME:071475/0338 Effective date: 20250527

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