US 20160361203A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2016/0361203 A1**

Khademhosseini (43) **Pub. Date: Dec. 15, 2016**

(54) **SYSTEM AND METHOD FOR REMOVAL OF EARWAX AND PARTICULATES**

(71) Applicant: **Nami Khademhosseini**, Falls Church, VA (US)

(72) Inventor: **Nami Khademhosseini**, Falls Church, VA (US)

(21) Appl. No.: **14/737,511**

(22) Filed: **Jun. 12, 2015**

Publication Classification

(51) **Int. Cl.**

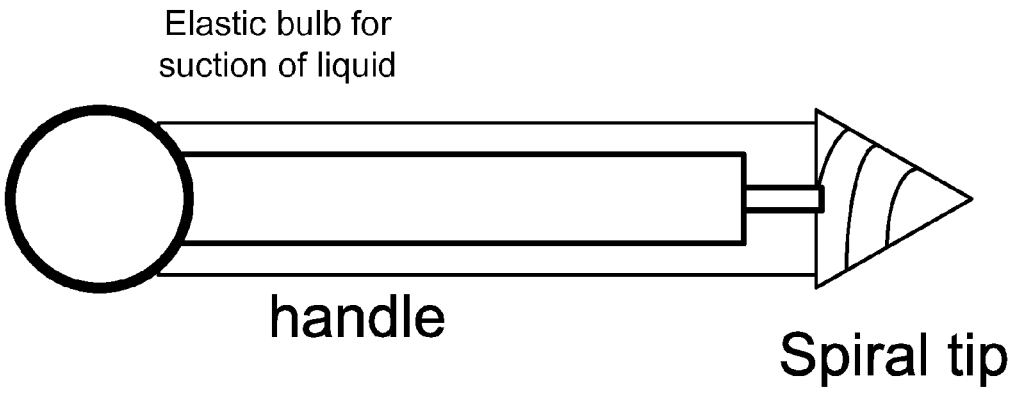
A61F 11/00	(2006.01)
A61F 13/38	(2006.01)
A61M 1/00	(2006.01)

(52) **U.S. Cl.**

CPC ***A61F 11/006*** (2013.01); ***A61M 1/0058*** (2013.01); ***A61F 13/38*** (2013.01)

(57) **ABSTRACT**

In one example, we describe a method and apparatus for cleaning the ear canal of cerumen contaminants, dust, and particulates. That includes a handle and replaceable tips, a combination of a flared design and solid base plate attached to the bottom of the tips, limiting the excessive insertion of the tip into the deep area of ear canal that could contact eardrum, which can seriously damage the eardrum and hearing capabilities. The handle has a slot in the front in which a tip can snap into, and as the whole system is secured together, the user can operate the system by spinning the handle, using fingers, e.g., in a clockwise direction, as the user proceeds to insert the tip in the ear canal. Different variations are also presented here.



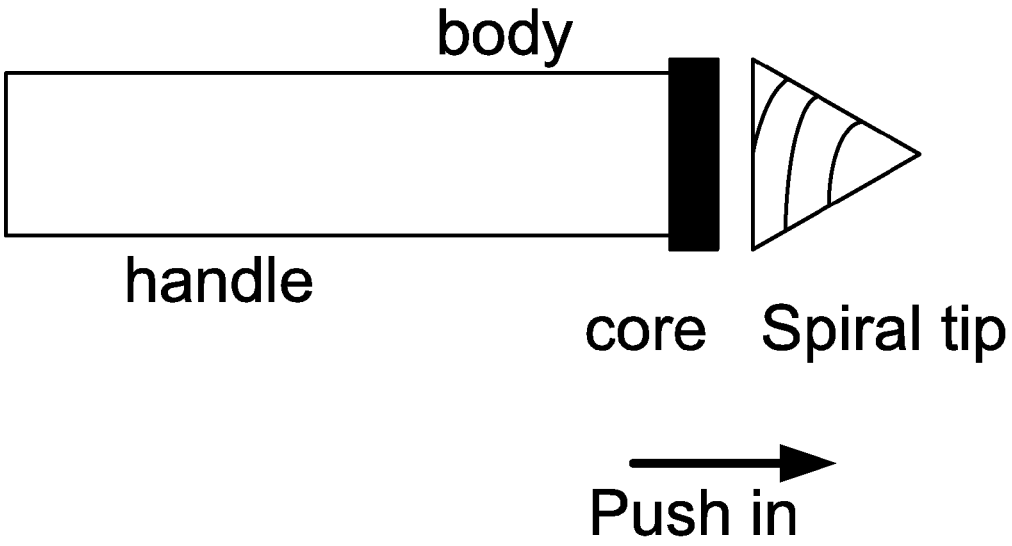


FIG 1

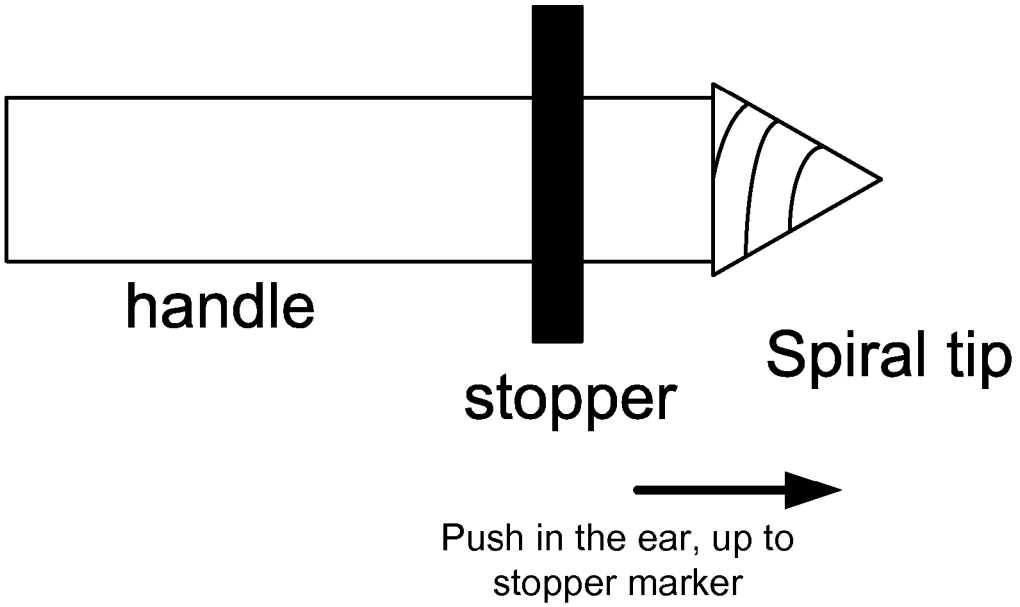

handle
stopper
Spiral tip
Push in the ear, up to
stopper marker

FIG 2

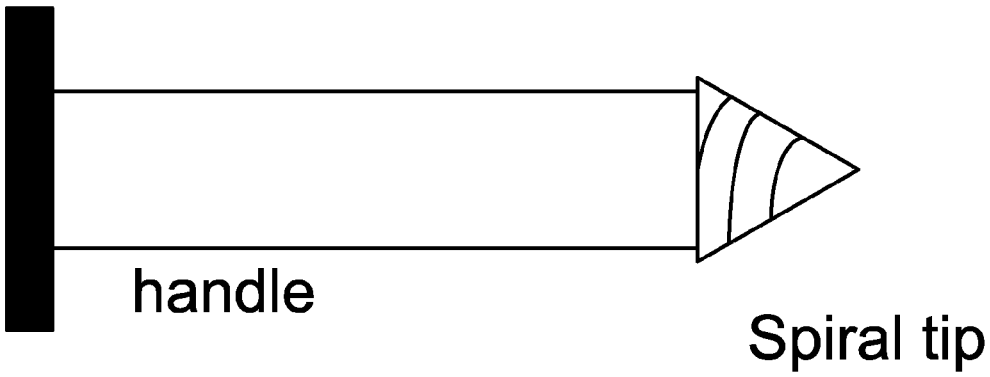


FIG 3

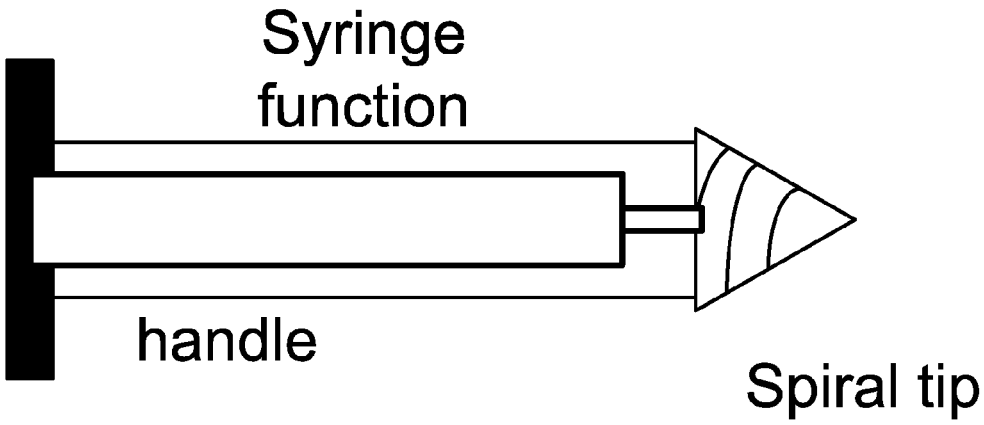


FIG 4

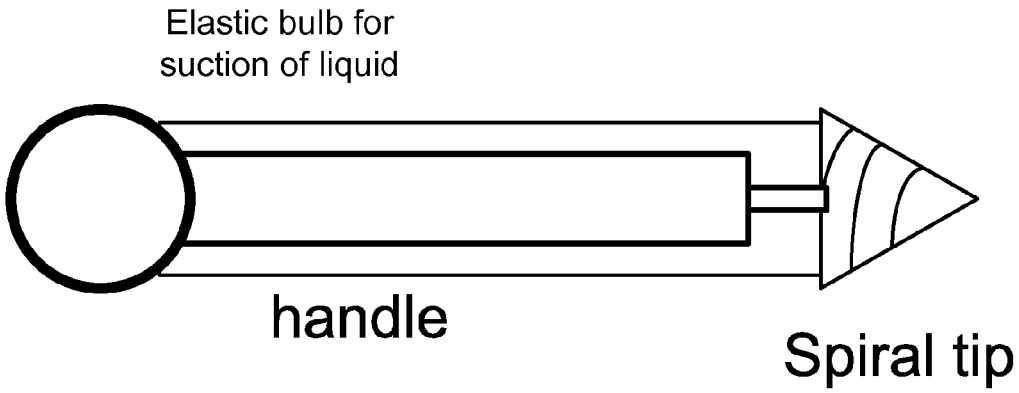


FIG 5

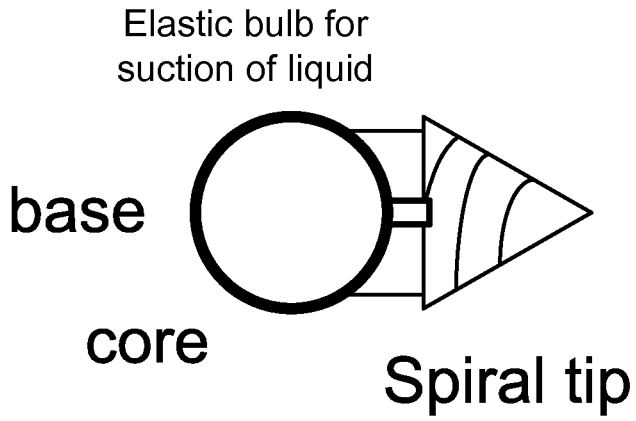


FIG 6

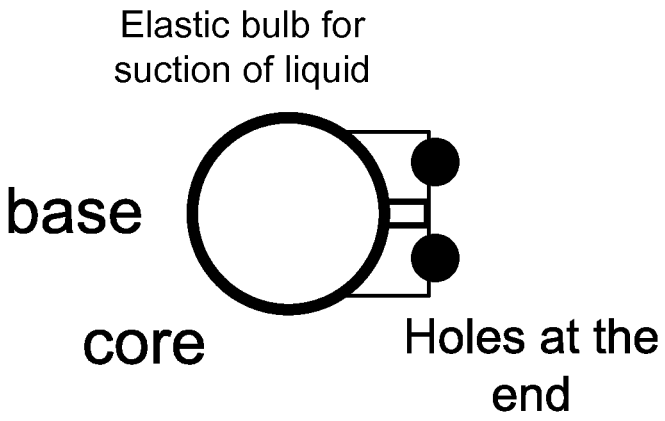

Elastic bulb for
suction of liquid
base
core
Holes at the
end

FIG 7

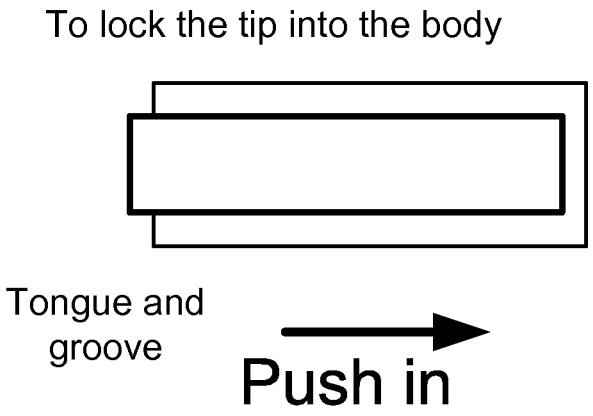


FIG 8

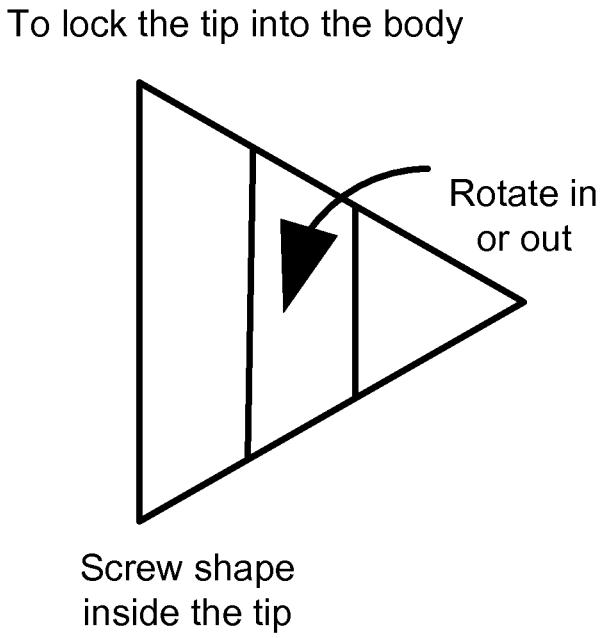

To lock the tip into the body
Rotate in
or out
Screw shape
inside the tip

FIG 9

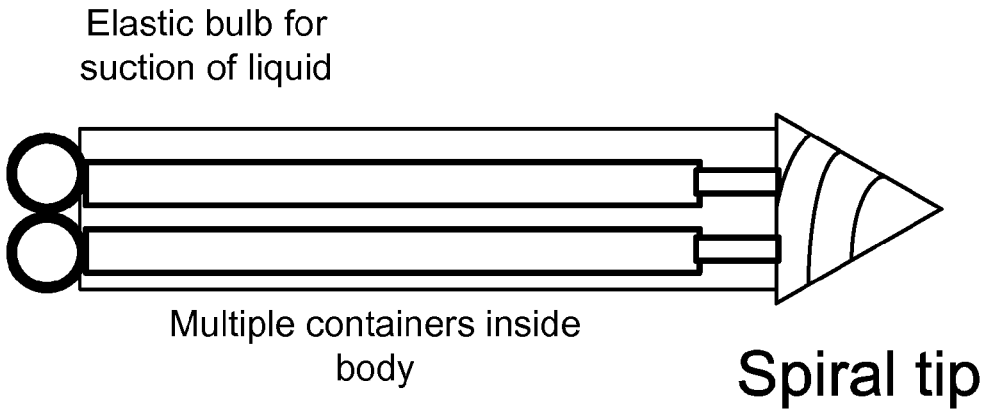

Elastic bulb for
suction of liquid
Multiple containers inside
body
Spiral tip

FIG 10

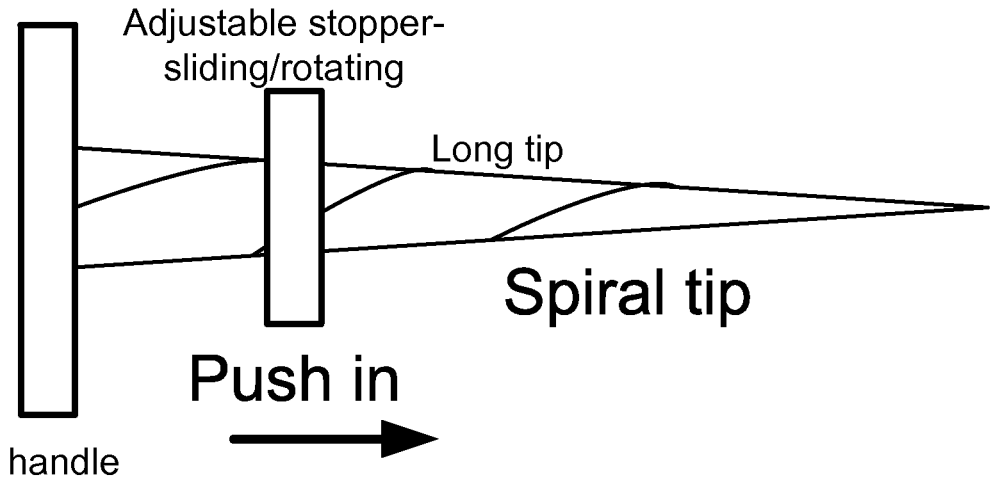

Adjustable stopper-
sliding/rotating
Long tip
Spiral tip
Push in
handle

FIG 11

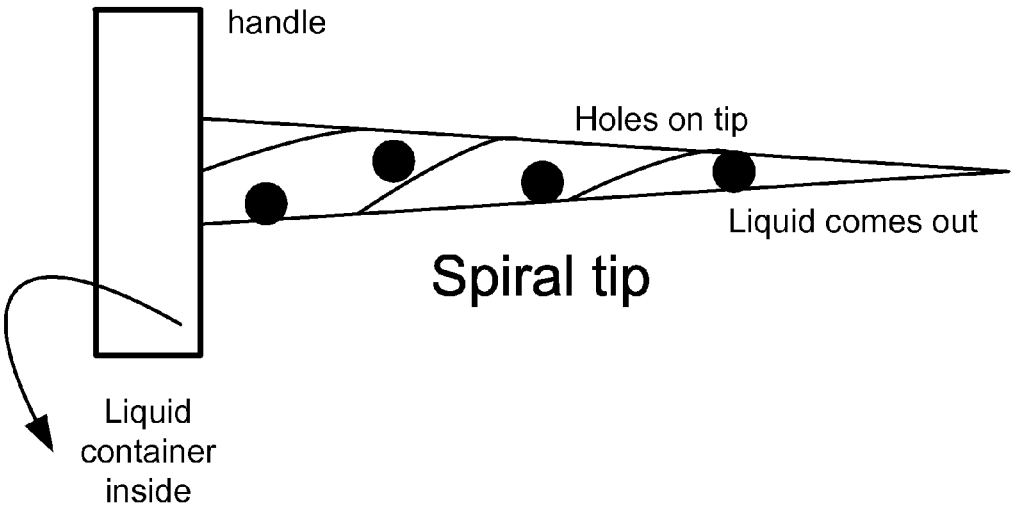

handle
Holes on tip
Liquid comes out
Spiral tip
Liquid
container
inside

FIG 12

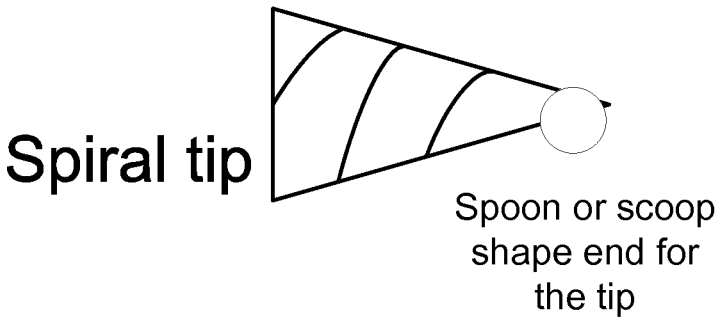


FIG 13

SYSTEM AND METHOD FOR REMOVAL OF EARWAX AND PARTICULATES

BACKGROUND OF THE INVENTION

[0001] The ear canal in human produce cerumen, also known as "earwax", in outer part of the ear canal. The use of audio and mobile device's ear buds, hearing aid buds, or sound protector ear plugs can push the earwax deeper into the ear canal, in which case it can cause many complications, such as reduction of hearing, due to earwax plague in the ear canal. Cerumen Impaction (Earwax Buildup and Blockage) is a major problem for many people. Regular Q-tip or cotton swab usually push the earwax further in, blocking and possibly damaging the ear.

[0002] This invention solves this problem, by using a system to remove ear wax properly. However, the invention and embodiments described here, below, have not been addressed or presented in any prior art. For example, some other patents are: D545431 by N. Khademhosseini, U.S. Pat. No. 8,777,972 by Steven Burres (Device and method for removing earwax), U.S. Pat. No. 6,695,802 (Ear cleaner device), U.S. Pat. No. 5,982,908 (Ear wax collection device for a hearing aid), and U.S. Pat. No. 5,107,861 (Safe ear clean button and protection with attachment device).

SUMMARY OF THE INVENTION

[0003] In one embodiment, we describe a method and a device for cleaning the ear canal of cerumen contaminants, dust, and particulates. That includes a handle and replaceable tips, a combination of a flared design and solid base plate attached to the bottom of the tips, limiting the excessive insertion of the tip into the deep area of ear canal that could contact eardrum, which can seriously damage the eardrum and hearing capabilities.

[0004] The handle has a slot in the front in which a tip can snap into, and as the whole system is secured together, the user can operate the system by spinning the handle, using fingers, in a clockwise direction, as the user proceeds to insert the tip in the ear canal. The handle also can be made, as a new design for syringe, to hold and dispense liquid that may facilitate the ear cleansing in different type of ear with different earwax condition.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] FIG. **1** is for one embodiment, as an example, for handle and tip.

[0006] FIG. **2** is for one embodiment, as an example, for handle and tip, with stopper.

[0007] FIG. **3** is for one embodiment, as an example, for handle with extra grip place.

[0008] FIG. **4** is for one embodiment, as an example, for handle with syringe function.

[0009] FIG. **5** is for one embodiment, as an example, for handle with elastic bulb for suction.

[0010] FIG. **6** is for one embodiment, as an example, for core/base and tip.

[0011] FIG. **7** is for one embodiment, as an example, for base with holes.

[0012] FIG. **8** is for one embodiment, as an example, for tongue and groove to lock the tip into the body, as one piece.

[0013] FIG. **9** is for one embodiment, as an example, for screw action inside the tip, to lock into the body.

[0014] FIG. **10** is for one embodiment, as an example, for multiple containers (**2** or more) inside body or handle.

[0015] FIG. **11** is for one embodiment, as an example, for long tip with stopper.

[0016] FIG. **12** is for one embodiment, as an example, for tip with holes.

[0017] FIG. **13** is for one embodiment, as an example, for tip with the end acting as spoon or scoop, with curved wide area or surface.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0018] The invention enables a user to perform a proper ear cleaning at home and without the need of visiting a doctor for ear cleaning One embodiment features a flared design, combined with solid plate at the tip base, limiting penetration into ear canal, therefore, preventing it from reaching to eardrum, to prevent injury.

[0019] One embodiment features:

[0020] Soft spirally finned tip that excavate and exfoliate earwax and articulates outward, and prevent pushing it further.

[0021] A handle locking system, specifically designed to:

[0022] i. snap into the back of the tip, to work as a system for spinning the spiral tip.

[0023] ii. It comprises of locking tabs that can be pushed forward by the user (after use) to snap off the tip, to facilitate disposal of the used tip, without the need of touching them, for cleanliness and better hygiene.

[0024] iii. Handle adapted to be grabbed by hand, and it can be made in two different categories for two separate methods of use:

[0025] 1. a solid piece, just as handle.

[0026] 2. a hollow handle that comprises of a syringe system to load, store, dispense, or spray a liquid into the ear canal, either before installing a tip to handle, or with open cell tip on it (opening in the foam, to allow liquid through the tip, around the ear canal). In this case, there will be an opening within the core piece that connects the tip to the handle to direct the liquid from handle to the tip.

[0027] Please refer to the 3D CAD design file in attachments (Appendices), for some embodiments and variations, with details.

[0028] One embodiment is a handle which comprises of a syringe system. The end of the handle is connected to the short piston (about half size of the handle's length), which can unlock from the body of the handle by a twist, so it can be free to be pulled back and out, which results to vacuuming function that pulls liquid in.

[0029] One embodiment is a tip that comprises of an opening in the middle of the bottom of the tip core piece, which directs liquid from handle to the tip.

[0030] One embodiment is a core locking piece with opening that allows liquid inside the handle to be sprayed in different angles inside the ear canal, before a tip is added to the system. In this method, consumer sprays wash inside ear directly with the liquid. After softening some hard earwax, one applies the tip on top of the sprayer to swab inside the ear canal and also to get the moist out.

[0031] One embodiment is a handle that comprises of a squeezable syringe bulb at the front flared part of the handle.

[0032] One embodiment is a handle, comprising of a squeezable syringe bulb at the end of the handle which helps the handle to work like a dripper. After spray wash inside ear, a tip can be snapped on the front of the handle, in order to spin the spiral tip for cleaning and getting the moist out.

[0033] Please note the importance of the flared design of the tip and the round plate at bottom (works as a stopper), that discourages the excessive penetration of the tip into the ear canal which results in safeguarding ear drum from accidental perforation.

[0034] Appendix 1-page 1 shows a 3-D view of the tip, for one embodiment. Appendix 1-page 2 shows a 3-D view of the tip and handle, together, as one piece, for one embodiment. Appendix 1-page 3 shows a 3-D view of the tip and handle, separated, as 2 pieces, for one embodiment. Appendix 1-page 4 shows a 3-D view of the tip and handle, together, as one piece, attached, for one embodiment. Appendix 1-page 5 shows a 3-D view of the tip, for one embodiment. Appendix 1-page 6 shows a 3-D view of the tip, attached to a handle, for one embodiment. Appendix 1-page 7 shows a 3-D view of the connection mechanism between tip and handle, for one embodiment.

[0035] Appendix 2-page 1 shows a 3-D view of the tip, from various angles and cross sections, with dimensions for a typical example, for one embodiment. Appendix 2-page 2 shows a 3-D view of the core and connection mechanism, from various angles and cross sections, with dimensions for a typical example, for one embodiment. Appendix 2-page 3 shows a 3-D view of the handle, from various angles and cross sections, with dimensions for a typical example, for one embodiment.

[0036] Appendix 3-page 1-FIG. 1 shows a view of the body with container in the middle, for one embodiment. Appendix 3-page 1-FIG. 2 shows a view of the tip, for one embodiment. Appendix 3-page 1-FIG. 3 shows a view of the tip with matching ending, with holes, for one embodiment. Appendix 3-page 2-FIG. 4 shows a view of the solid handle with liquid bulb, with holes, for suction of liquid, for one embodiment, for cleaning, rinsing, flushing, soaking, dissolving, medicating, drug-delivery, coating, or drying (the ear or the wax or the dirt). The soft plastic or elastic bulb or rubber can be pushed in by fingers, and then get back to the original spherical shape by itself, to suck the air or liquid or fluid from the ear or container or bottle or jar, for any or all the purposes mentioned above.

[0037] Appendix 3-page 2-FIG. 5 shows a bulb at the end of the handle, doing the same function as described above, with container within or hollow body, to have the liquid or fluid in, for storage and later usage, in the long handle, with tip narrowing down, with holes near the tip of the handle, which will match and inserted into a open cell foam tip or other tips (e.g., replaceable or exchangeable or temporary or disposable or permanent tip, with different materials or properties), as shown in the figure, for one embodiment.

[0038] Appendix 3-page 3 shows a view of the body, with handle, for one embodiment. One end is circular flat for holding fingers or as marker, and the other end is for engaging and attaching to the tip.

[0039] Appendix 3-page 4 shows a view of the body, with handle, with spiral tip attached on one end, for one embodiment. Appendix 4 shows a view of the body, with handle, at one end, for one embodiment. Appendix 5-page 1 shows a view of the tip, with spiral tip, with attaching or engaging end, for one embodiment. Appendix 5-page 2 shows a view of the tip, with spiral tip, attached to a body, for one embodiment.

[0040] Appendix 5-page 3 shows a view of the tip, with spiral tip, attached to a body, for one embodiment, shown as a cross section, cut in half, along the length. Appendix 5-page 4 shows a view of the body, at one end, for attachment to a tip, with gaps or slits or cuts or openings, to engage the tip and attach to the tip, for one embodiment.

[0041] Appendix 5-page 5 shows a view of the tip, with spiral tip, attached to a body, for one embodiment. Appendix 5-page 6 shows a view of the tip, with spiral tip, for one embodiment.

[0042] Appendix 6-page 1 shows a view of the tip, with spiral tip, for one embodiment, with 3D views and a cross section from half/middle, for one-fin spiral configuration. Appendix 6-page 2 shows a view of the tip, with spiral tip, for one embodiment, with 3D view, for one-fin spiral configuration. Appendix 6-page 3 shows a view of the tip, with spiral tip, for one embodiment, with 3D view, for one-fin spiral configuration.

[0043] Appendix 7 shows a view of the tip, with spiral tip, for one embodiment, with 3D view, for two-fin spiral configuration. Appendix 8 shows a view of the tip, with spiral tip, for one embodiment, with 3D view, for three-fin spiral configuration.

[0044] Appendix 9-page 1 shows a view of the 2 tips at 2 ends of a handle or body, with spiral tips, for one embodiment, with 3D view. Appendix 9-page 2 shows a view of the spiral tip, for one embodiment, with 3D view. Appendix 9-page 3 shows a view of the 2 tips at 2 ends of a handle or body, with spiral tips, for one embodiment, with 3D view.

[0045] As shown above, we can have N-fin spiral configuration, but after or above N=3, it may not be any more efficient in action as the lower number fin situations on the spiral tip, for the removal of ear wax. So, for most cases, in one embodiment, we use 2-fin and 3-fin configurations. One-fin models are very simple in design and still do the job very well.

[0046] As shown above, in figures, for one embodiment, we have rib shape or tubs or multiple pins or array of small bars or brush shape or comb shape, for the tip and/or body, to lock into each other, with slit or opening on the other side to engage the other side, to lock in and attach with each other, as one unit. The locking is done by pushing these two parts toward each other, to snap into a locked position. To release, the fingers push on the locked parts, to push in, and pull apart the parts simultaneously, to get the parts separated from each other. So, we can do the snap off by fingers, to separate them (tip separated from the body).

[0047] For one embodiment, we have touch free tip replacement, with clean tip or sterilized tip, without touching with fingers to avoid contamination the tip. For one embodiment, we have locking system for the tip and body. For one embodiment, we can have any material for the body or handle, e.g., metal, alloy, plastic, rubber, elastic, wood, polymer, glass, or the like. For one embodiment, we have bowl shaped or spoon shaped tip for scooping the ear wax easier and more efficiently, and avoid sharp edges on tip in the ear canal for possible injury.

[0048] For one embodiment, we have tip made of open cell foam, moist absorbent, regular foam, sponge, cotton, clothing, soft tissue, towel, Q-tip material, wool, silk, nylon,

acrylic, petroleum based material, synthetic material, porous material for absorbing moisture and liquid, dry fabric, filter material, coarse material, bumpy surface material, or the like.

[0049] For one embodiment, we have container or box or enclosure or tube or filler or space or storage or liquid holder for liquid or fluid for cleaning ear, e.g., wash, anti-bacteria, dissolve wax, soften wax, rinse, dry, or the like, through for example, the tip or holes or syringe shape or the like. For one embodiment, we have disposable tip. For one embodiment, we have the pressure from the back side, instead of the handle, to remove the tip.

[0050] For one embodiment, we have liquid stored in the end of the body or the whole body. For one embodiment, we have pushing mechanism to push the liquid out to clean the ear. For one embodiment, we have spoon or scoop shape at the head of the tip, to better take out the wax, or use a wide-curved surface for that purpose. For one embodiment, we have syringe operation with handle for holding the liquid, to load and unload. For one embodiment, we have piston to load and unload liquid.

[0051] For one embodiment, we have cap like grooves to rotate the tip into the body similar to the screw action, to lock that in, to attach to the body or handle. For one embodiment, we have syringe action to suck the liquid and store and then push the piston to eject the liquid for use. For one embodiment, we have core piece attached to the tip, with holes in the core piece, for different positions and directions, dispensing liquid into the ear.

[0052] For one embodiment, we have syringe bulb as elastic sphere for use of liquid and storage into the container within body. For one embodiment, we have **2** holes on core piece at one end to engage with the tip. For one embodiment, we have variations on holes (number and shapes and patterns) on core piece. For one embodiment, we have syringe bulb for suction action and function at the end of the handle, similar to eye dripper device. For one embodiment, we have one piece tab or tongue to go into groove or opening for better locking purpose and longevity of the tab or tongue. For one embodiment, we have elastic or flexible material for tip to have a soft tip for better operation.

[0053] For one embodiment, we have container for liquid as glass, metal, plastic, wood, fiber, or the like. For one embodiment, we have o-ring or copper ring or plastic ring or elastic ring or band or the like, to avoid leaking from the container or syringe sides or cylinder sides, inside the handle or body, for proper operation.

[0054] FIG. **1** is for one embodiment, as an example, for handle and tip. FIG. **2** is for one embodiment, as an example, for handle and tip, with stopper. FIG. **3** is for one embodiment, as an example, for handle with extra grip place. FIG. **4** is for one embodiment, as an example, for handle with syringe function. FIG. **5** is for one embodiment, as an example, for handle with elastic bulb for suction.

[0055] FIG. **6** is for one embodiment, as an example, for core/base and tip. FIG. **7** is for one embodiment, as an example, for base with holes. FIG. **8** is for one embodiment, as an example, for tongue and groove to lock the tip into the body, as one piece. FIG. **9** is for one embodiment, as an example, for screw action inside the tip, to lock into the body. FIG. **10** is for one embodiment, as an example, for multiple containers (**2** or more) inside body or handle.

[0056] FIG. **11** is for one embodiment, as an example, for long tip with stopper. FIG. **12** is for one embodiment, as an example, for tip with holes. FIG. **13** is for one embodiment, as an example, for tip with the end acting as spoon or scoop, with curved wide area or surface.

[0057] Any variations of the above teaching are also intended to be covered by this patent application.

1. An ear cleaning apparatus, said apparatus comprising:
a handle;
a tip;
wherein said handle is locked into said tip by a tongue-and-groove mechanism;
wherein said tip is spiral shaped;
wherein said tip has a spoon shape ending.

2. The ear cleaning apparatus as recited in claim **1**, said apparatus comprises:
a stopper.

3. The ear cleaning apparatus as recited in claim **2**, wherein said stopper is located on said handle.

4. The ear cleaning apparatus as recited in claim **3**, wherein said stopper does not let said tip go into an ear canal beyond said stopper's position.

5. The ear cleaning apparatus as recited in claim **1**, said apparatus comprises: a container for liquid.

6. The ear cleaning apparatus as recited in claim **1**, said apparatus comprises: multiple containers for liquid.

7. The ear cleaning apparatus as recited in claim **1**, said apparatus comprises: a syringe.

8. An ear cleaning apparatus, said apparatus comprising:
a handle;
a tip;
wherein said handle is locked into said tip by a screw mechanism;
wherein said tip is spiral shaped;
wherein said tip has a spoon shape ending.

9. The ear cleaning apparatus as recited in claim **8**, said apparatus comprises:
a stopper.

10. The ear cleaning apparatus as recited in claim **9**, wherein said stopper is located on said handle.

11. The ear cleaning apparatus as recited in claim **10**, wherein said stopper does not let said tip go into an ear canal beyond said stopper's position.

12. The ear cleaning apparatus as recited in claim **8**, said apparatus comprises: a container for liquid.

13. The ear cleaning apparatus as recited in claim **8**, said apparatus comprises: multiple containers for liquid.

14. The ear cleaning apparatus as recited in claim **8**, said apparatus comprises: a second tip, which has spiral shape, located at a second end of said handle.

15. An ear cleaning apparatus, said apparatus comprising:
a handle;
a tip;
wherein said handle is locked into said tip by a screw mechanism;
wherein said tip is spiral shaped;
a container;
wherein said container holds liquid.

16. The ear cleaning apparatus as recited in claim **15**, wherein said container is located inside said handle.

17. The ear cleaning apparatus as recited in claim **15**, wherein said container is located inside said tip.

18. The ear cleaning apparatus as recited in claim **15**, wherein said container is located between said handle and said tip.

19. The ear cleaning apparatus as recited in claim **15**, said apparatus comprises: an elastic bubble or spherical shaped bulb for suction of said liquid.

20. The ear cleaning apparatus as recited in claim **15**, said apparatus comprises: a stopper or marker for depth of insertion into an ear canal.

* * * * *