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(54) **FILTER CARTRIDGE CLEANING KIT**

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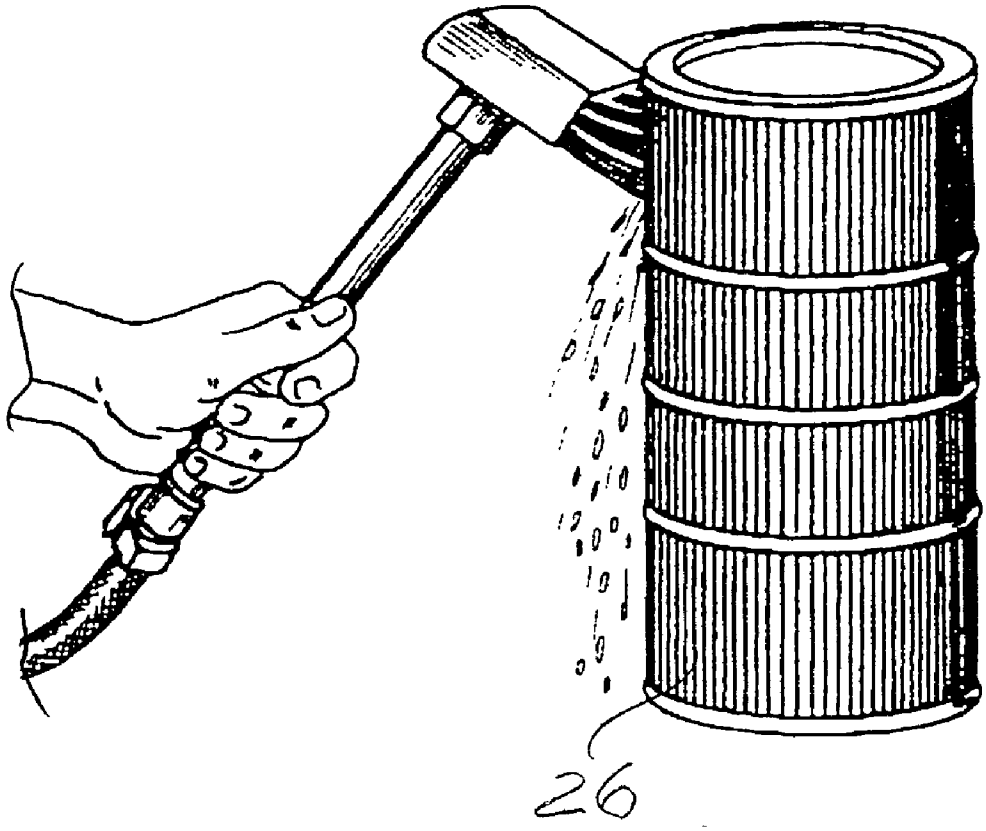
(57) **ABSTRACT**

A kit contains a plurality of cleaning tools selectively attachable to a common tool carrier to form an assembly for cleaning various filtering surfaces of a filter cartridge.



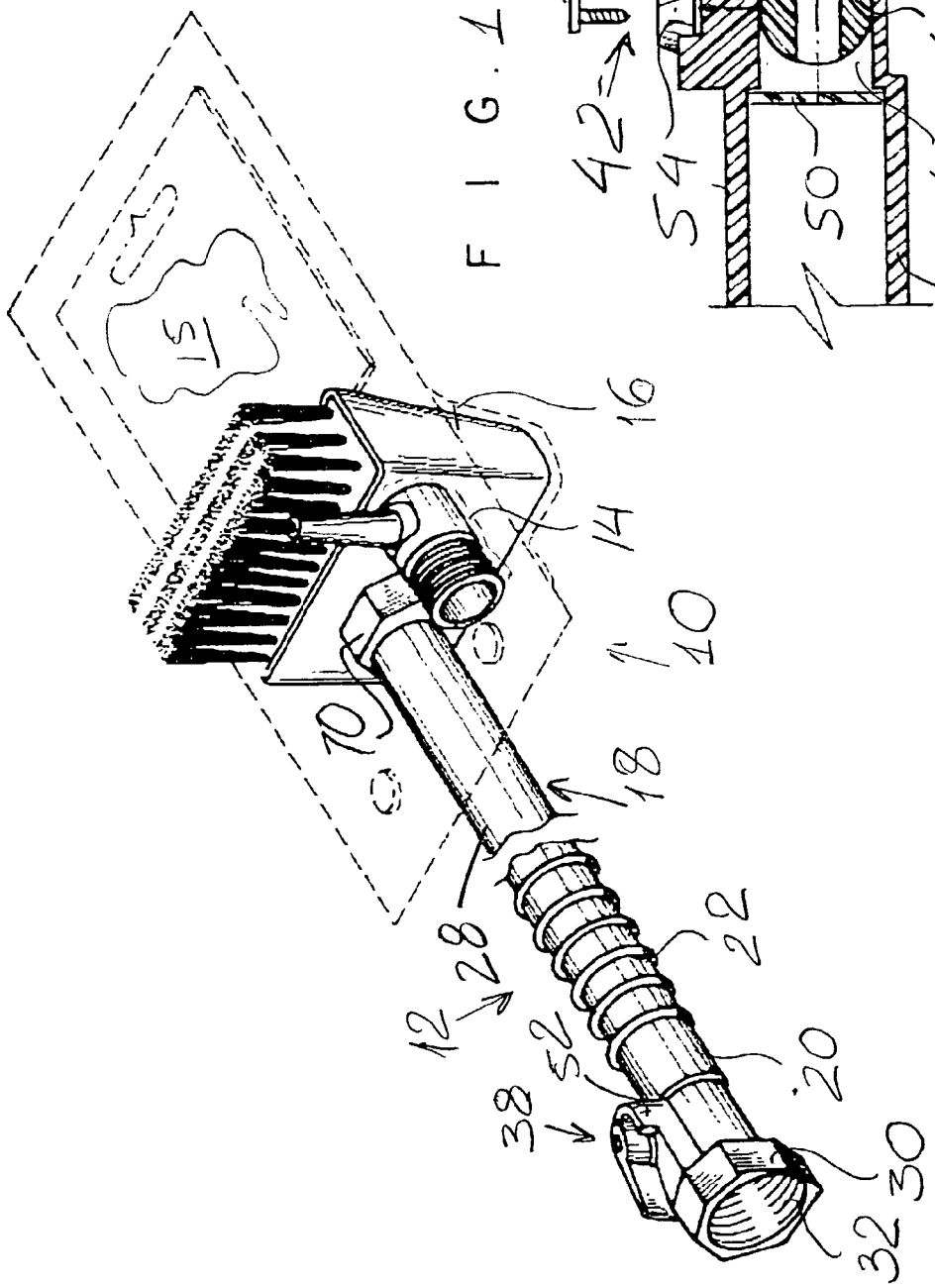


FIG. 1

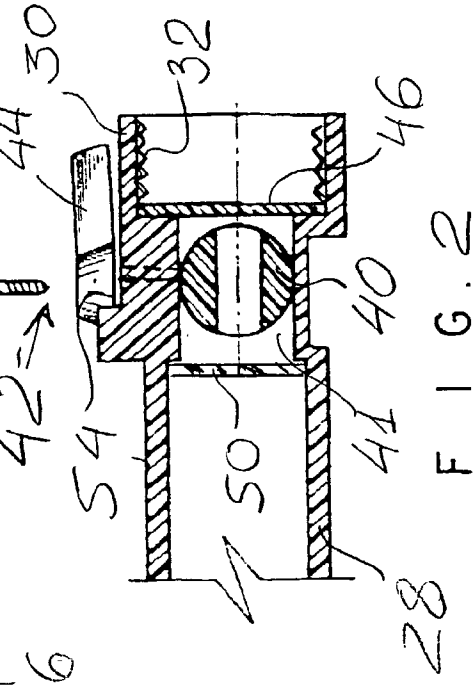


FIG. 2

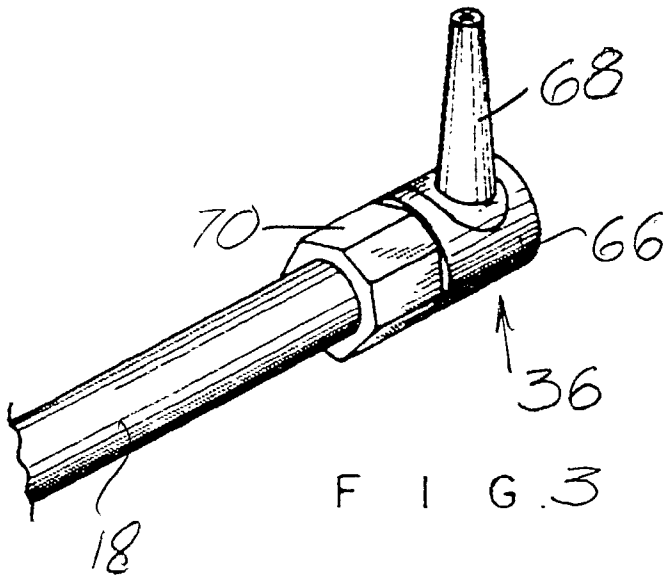


FIG. 3

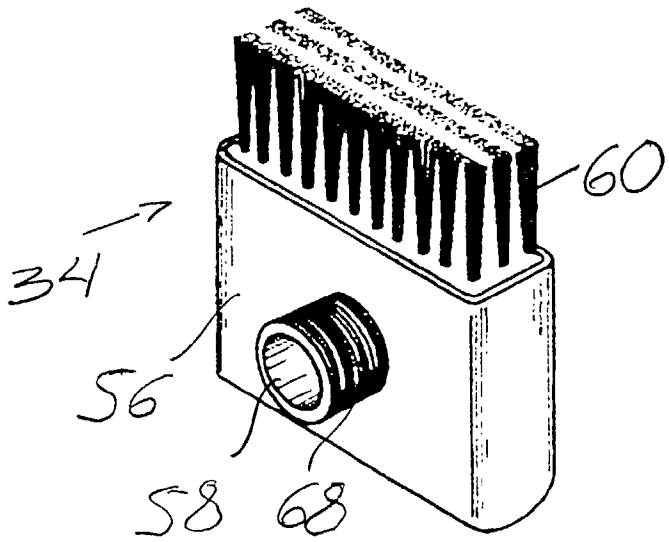


FIG. 6

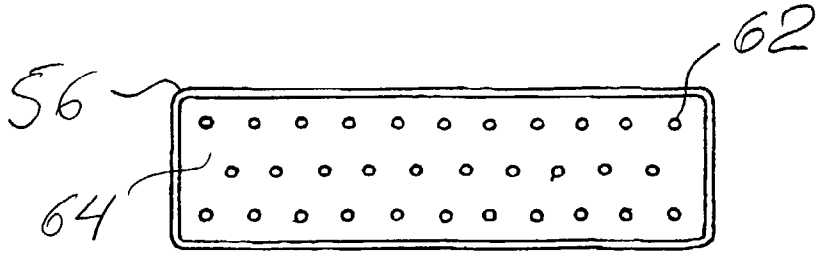


FIG. 7

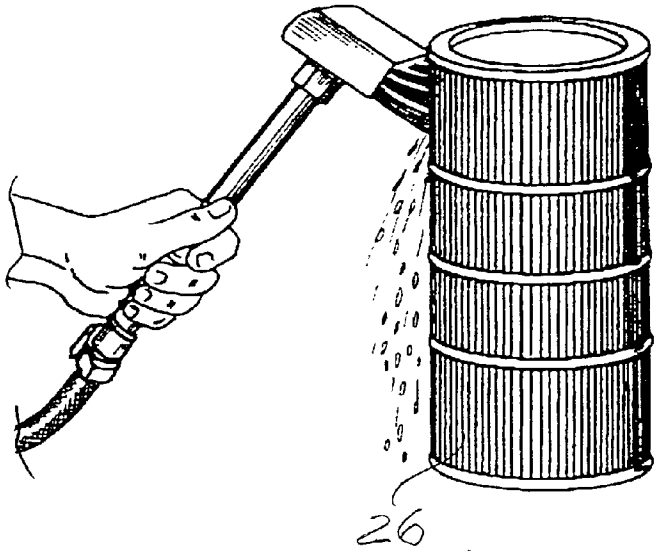


FIG. 4

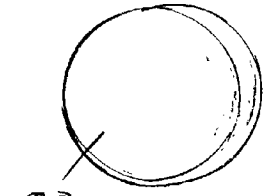


FIG. 8

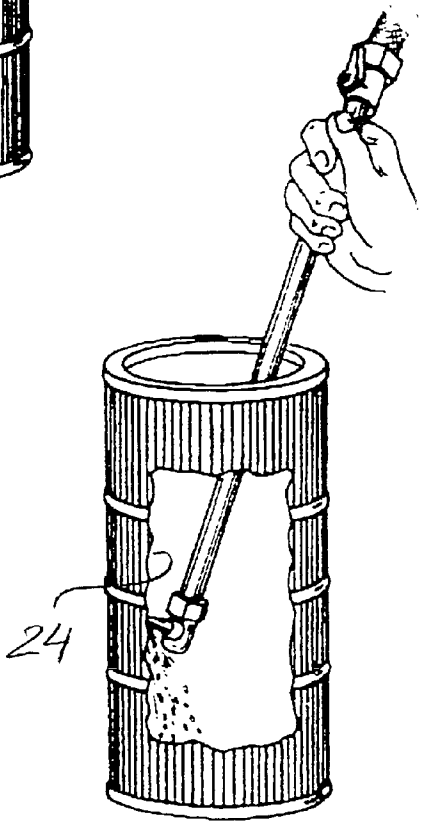


FIG. 5

FILTER CARTRIDGE CLEANING KIT

SUMMARY OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The invention relates to a tool for cleaning pool/spa filtering equipment. Particularly, the invention relates to a kit containing an assembly of multiple cleaning tools configured to be used for cleaning various filtering surfaces of the filter cartridge.

[0003] 2. Background of the Invention

[0004] The safe and efficient handling and distribution of swimming pool chemicals and the effective removal of surface water debris from swimming pools is a constant maintenance requirement. Conventionally, swimming pools include a water filtration system for purifying the swimming pool water by preventing solids, semi-solids and various oils from reentering the pool. Typically, such a system is provided with a pump which circulates water within the swimming pool, causing the pool water to pass through a filter.

[0005] A typical filter device or a pool skimmer can be installed on the side of the swimming pool at or about the desired water level and regardless of its overall structure necessarily includes a filter cartridge. The filter cartridge is an assembly which may, for example, contain a reusable core and a coreless element receiving the core.

[0006] Either of the filter cartridge components, and particularly the coreless element is provided with a pleated material, such as paper, blocking solid and semi-solid particles flowing in with the pool water from reentering the pool. The effective life of the filter depends upon the degree of contamination of the surface of the pleated material. To provide the filtering components with maximum longevity, it is imperative that the pleated material be periodically cleaned.

[0007] The filter cartridge can be cleansed of coarse dirt and debris by pressure washing inside and out with a garden hose. However, because of the narrow pleats, it is difficult to use a hose for effectively delivering water to narrow trough-like areas. Particularly, the difficulty arises during cleaning the inner surface of the filter cartridge, which is typically a long structure having a relatively small inner diameter. After hosing and drying the cartridge, the filtering surface areas have to be carefully brushed or vacuumed to remove fine particles.

[0008] Such fluids as algae, suntan oil, and body oil, which are typically present in the pool water and tend to form a coating on the filter pleats, may not be thoroughly removed by hosing or vacuuming. Accordingly, the filtering surfaces require brushing or any other action associated with frictional contact between a cleaning element and the filtering surface. Yet, the use of brushes has to be carefully monitored to prevent the delicate filtering material from being damaged.

[0009] While numerous types of cleaning tools are marketed, applicant is not aware of a combination of tools specifically designed to allow the user to effectively clean inner and outer surfaces of the filter cartridge used in swimming pools and spa. Many pool owners often use tools that are not suitable for accomplishing such a simple, but at the same time, delicate task as cleaning the pleated surfaces of the filter cartridge. As a consequence, the filters are frequently damaged and should be replaced.

[0010] It is, therefore, desirable to provide a filter cartridge cleaning modular system capable of effectively cleaning the inner and outer surfaces of various filtering components.

OBJECTS OF THE INVENTION

[0011] It is an object of the present invention to provide a kit containing a variety of necessary tools shaped and dimensioned to safely and effectively clean the inner and outer surfaces of a filter cartridge used in pools and spas.

[0012] A further object of the invention is to provide an assembly for cleaning filtering components of the filter cartridge having a combination of cleaning elements selectively adjustable on a common tool carrier.

[0013] Yet another object of the invention is to provide an assembly for cleaning filtering components having a simple and easily adjustable structure facilitating effective cleaning of the differently dimensioned inner and outer surface of the filtering cartridge.

SUMMARY OF THE INVENTION

[0014] Consistent with the foregoing objects, the invention discloses a kit having a compact structure which includes an array of compartments. Each of the compartments is shaped and dimensioned to receive a respective, uniquely shaped cleaning tool of an inventive cleaning assembly.

[0015] One of the advantages of the inventive kit is convenience offered by a single package which contains various, but necessary tools, which are, otherwise, sold separately. Accordingly, the inventive kit can save the user from unnecessary aggravation typically associated with purchasing individual cleaning tools. A further advantage of the kit is an arrangement having a series of illustrations showing how to correctly use each of the purchased tools so as to maximize the cleaning effect and to prevent filtering surfaces from being damaged.

[0016] In accordance with one aspect of the invention, the inventive cleaning assembly includes a tool carrier and various individual tools selectively attachable to the tool carrier to provide effective cleaning of different filtering surfaces. At least one of the tools can provide effective brushing of a filtering surface to be cleaned while watering this surface. The brushing tool has a combination of tufts or bristles and an array of openings arranged on a holder in a manner allowing the user to gently rub the surface which, at the same time, is amply watered to minimize damaging contact between the bristles and the filtering surface.

[0017] Accordingly, one of the advantages of the inventive cleaning assembly is the provision of the brushing tool minimizing a possible damage that often occurs due to excessive frictional contact between the filtering surface to be cleaned and the bristles. Furthermore, the brushing tool allows the user to effectively clean filtering surfaces in a time-efficient manner.

[0018] Another aspect of the invention includes a nozzle-like cleaning tool particularly suitable for treating narrow troughs of the pleated filtering surfaces of the filter cartridge. Due to the elongated conical spout of the nozzle-like tool,

water traversing a hollow housing of this tool can be conveniently directed to the desired areas, which are usually trough-like formations provided on the outer and, particularly, on the inner surface of the filter cartridge.

[0019] A further aspect of the invention is directed to a simple structure allowing the user to selectively mount, use, and replace the cleaning tools of the inventive assembly on the tool carrier.

[0020] In accordance with a further aspect of the invention, the inventive kit may further include a compartment shaped and dimensioned to house a water-disinfecting and/or cleaning tablet.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] **FIG. 1** is an isometric view of the inventive kit containing an assembly for cleaning a filter cartridge.

[0022] **FIG. 2** is a sectional view of a proximal end of a tool carrier provided with a fluid-controlling mechanism of the inventive assembly;

[0023] **FIG. 3** is an isometric exploded view of the inventive assembly for cleaning the filter cartridge components;

[0024] **FIG. 4** illustrates the applicability of one of the embodiments of the cleaning assembly shown in **FIG. 1**;

[0025] **FIG. 5** illustrates the applicability of another embodiment of the cleaning assembly shown in **FIG. 2**;

[0026] **FIG. 6** is an isometric view of another tool of the inventive assembly;

[0027] **FIG. 7** is a top view of the tool shown in **FIG. 6**; and

[0028] **FIG. 8** is an isometric view of a water-disinfecting table forming a part of the inventive assembly and kit.

SPECIFIC DESCRIPTION

[0029] Referring generally to FIGS. **1-8**, and particularly to **FIG. 1**, an inventive kit **10** is configured to conveniently compartmentalize a cleaning assembly **12** including a multiplicity of cleaning tools, each of which is shaped and dimensioned to provide effective cleaning of a respective surface of the filter cartridge. The kit **10** is provided with a plurality of separate compartments **14, 16** each shaped and dimensioned to house a respective tool. Thus, the kit **10** has a space-efficient and aesthetically appealing structure. In addition, the kit **10** provides the buyer with illustrative instructions **15** clearly showing the concrete application of each of the cleaning tools.

[0030] The cleaning assembly **1** includes an elongated tool carrier **18 (FIGS. 1, 3)** allowing the user to extend the tools, which are removably coupled to the distal end of the carrier, to hard-to-reach inner **24** and outer **26** surfaces of the filter cartridge, as shown in **FIGS. 4 and 5**. A hollow elongated shaft **28 (FIG. 1)** of the tool carrier **18** is formed with a handle **20** having a textured surface, for example, an array of spaced ribs **22**, which can provide the user with a reliable grip on the tool carrier during a cleaning operation. The outer diameter of the handle **20** is somewhat larger than the outer diameter of the hollow shaft **28**. The interior of the hollow shaft **28** and the handle **20** form a guide channel for delivering fluid from a main towards the surfaces to be cleaned. The handle **20** terminates with a flange **30** provided with an inner threaded surface **32 (FIG. 1)** dimensioned to engage a hose or a faucet.

[0031] To control water delivery, the assembly **12** is provided with a fluid-controlling mechanism **38 (FIGS. 1, 2)**, which includes a ball valve **40** and an actuator **42**, better seen in **FIG. 2**. The ball valve **40** is displaceably mounted within a ball-seat area **41** of the interior of the handle **20** and is located adjacent to an inner threaded surface **32** of the flange **30**. The ball-seat area **41** is configured with an inner diameter which is somewhat smaller than an inner diameter of the flange **30** and is dimensioned to allow the ball valve **40** to rotate between a closed and open position. A ball-valve actuator **42** is removably mounted on the outer surface of the flange **30** and includes a lever **44** coupled to the ball valve **40** by a suitable fastener **43 (FIG. 2)**. The lever **44** is dimensioned to provide the user with a comfortable grip. In the open position, the ball valve **40** provided with an inner passage is displaced so that the passage is aligned with the interior of the hollow shaft **28** and is, thus, traversed by water running toward the distal end of the hollow shaft. In response to an external force applied by the user, the lever **44** displaces the ball valve **40** in the closed position, in which the flow of water is blocked. To reliably seal the interior of the hollow shaft **28**, an O-ring seal **46 (FIG. 2)** is provided between the threaded surface **32** and the ball-seat area **41** of the flange **30**. The O-ring seal **46** can be provided with radially spaced lugs engaging between threads of the threaded surface **32** and positioned to prevent excessive penetration of the hose into the flange **30**. Another O-ring seal **50 (FIG. 2)** is juxtaposed with the downstream region of the ball-seat area to ensure a reliable seal preventing water from traversing the interior of hollow shaft **28** in the closed position of the ball valve. To prevent the possibility of radial displacement of the actuator **42** if a fastener **43** gets loose, the outer surface of the flange **30** has a guide surface **52 (FIG. 1)** extending complementary to and partially surrounding an annular surface of a base **54 (FIG. 2)** of the lever **44**.

[0032] As shown in **FIGS. 1 and 6**, the inventive assembly includes a brush **34** particularly shaped and dimensioned to provide effective cleaning of the outer surfaces **26 (FIG. 4)** of the filtering components. A housing **56** is provided with a flange **58**, which has an outer threaded surface **68** engaging an inner threaded surface of a flange **70 (FIG. 1)** formed on the distal end of the hollow shaft **28**, and has a hollow interior in flow communication with the interior of the hollow shaft **28** of the tool carrier. To provide such a flow communication, the housing **56** receives in a press-fit manner a bristle holder **64 (FIGS. 6, 7)** provided with alternating rows of bristles **60** and openings **62**. The openings **62** can be either uniformly dimensioned or variously dimensioned and shaped so that the openings of different rows are not identical. In addition, the openings forming the same row can have either uniform or different shapes and sizes. The openings **62** forming one of the rows of openings can be aligned with or offset from the openings of the other row, as shown in **FIG. 7**. All of these arrangements of the openings **62** are intended to provide effective cleaning of differently dimensioned various surfaces of the filtering components.

[0033] Turning to **FIG. 3, a** tool **36** has a hollow body **66** formed with an inner threaded surface and an elongated,

relatively narrow conical spout **68** sized to direct a jet of water to the desired narrow regions of the filtering pleats.

[**0034**] Note that the threaded surfaces of the tools and the flange **70** can be provided so that it is the tools that have the inner threaded surface engaging the outer threaded surface of the flange **70**. Also, other types of telescopic connections between the tools and the tool carrier can be utilized as long as such a connection is waterproof. In general, the entire cleaning assembly **12** is made from polymeric material. However, other types of materials resistant to corrosion can be used as well.

[**0035**] In addition, the kit **10** can be further provided with an additional compartment housing at least one cleaning and/or water-disinfecting tablet **80** containing a detergent, as shown in **FIG. 8**. The tablet **80** is 100% soluble and is pre-measured to be placed in a skimmer or used with the tool carrier. For example, the tablet **80** can be placed in the handle between the ball-seat area **41** and the threaded surface **32**. Alternatively, the tablet can be received in the distal end of the hollow shaft **28** and placed on a seat located immediately upstream from the inner threaded surface of the flange **70**. To place the tablet **80** on the seat, the tablet is dimensioned to be small enough so it can be carried through the diameter of the flange **70** and allow a washing liquid to pass by towards the distal end of the tool carrier. Furthermore, the inventive kit can have a separate compartment sized and shaped to receive the tablet **80**.

[**0036**] While this disclosure has described various aspects of the present invention, the latter is not limited thereto, and is susceptible to numerous changes and modifications as known to those skilled in the art. Therefore, the invention is not limited to the details shown and described herein, and includes all such changes and modifications as are encompassed by the scope of the appended claims.

What is claimed is:

1. A filter cartridge cleaning assembly for removing contaminants from filtering surfaces, comprising:

a tool carrier provided with an interior adapted to convey fluid; and

a plurality of cleaning tools selectively attachable to the tool carrier and being in flow communication with the interior of the tool carrier, each of the tools being shaped and dimensioned to effectively clean a respective one of the filtering surfaces.

2. The cleaning assembly according to claim 1, wherein the tool carrier has an elongated hollow shaft provided with distal and proximal ends each having a respective flange.

3. The cleaning assembly according to claim 2, wherein each of the flanges is provided with a respective threaded surface.

4. The cleaning assembly according to claim 3, wherein one of the flanges mounted on the distal end of the hollow shaft is shaped and dimensioned to receive each of the cleaning tools upon engaging the threaded surface of the one flange with a threaded surface provided on each of the of the tools.

5. The cleaning assembly according to claim 2, wherein the other flange mounted on the proximal end of the hollow shaft has a valve assembly for controllably regulating fluid flow through the follow shaft.

6. The cleaning assembly according to claim 5, wherein the valve assembly includes a ball valve provided with a passage and mounted internally within the other flange, the ball valve being displaceable between an open position, in which the passage is aligned with the interior of the hollow shaft to provide fluid flow, and a closed position, in which the ball valve blocks the fluid flow.

7. The cleaning assembly according to claim 6, wherein the valve assembly further has a lever provided on the outer surface of the other flange and coupled to the ball valve to provide displacement thereof between the open and closed position in response to an external force.

8. The cleaning assembly according to claim 7, wherein the lever is removably mounted on the outer surface of the other flange.

9. The cleaning assembly according to claim 8, wherein the outer flange is provided with a guide surface extending complementary to a base of the lever.

10. The cleaning assembly according to claim 6, wherein the other flange is formed with a seat portion extending from the threaded surface and dimensioned to receive the ball valve.

11. The cleaning assembly according to claim 10, further comprising an O-ring seal located between the threaded surface and seat portion of the other flange for sealing the interior of the hollow shaft.

12. The cleaning assembly according to claim 1, wherein one of the tools is a brush having a hollow housing and a brush flange attachable to the threaded surface of the one flange provided on the distal end of the hollow shaft.

13. The cleaning assembly according to claim 12, wherein the brush has a bristle holder provided with a plurality of spaced rows of bristles alternating with rows of openings which are in flow communication with the interior of the hollow shaft.

14. The cleaning assembly according to claim 13, wherein the openings are arranged so that the openings of different rows are aligned with one another.

15. The cleaning assembly according to claim 13, wherein the openings of different rows of openings are offset relative to one another.

16. The cleaning assembly according to claim 1, wherein the plurality of the tools includes a nozzle having a body attachable to the threaded portion of the one flange formed on the proximal end of the hollow shaft and a conical spout.

17. The cleaning assembly according to claim 3, wherein the threaded surfaces of the one and other flanges are inner surfaces, whereas the threaded surfaces of the tools are outer.

18. The cleaning assembly according to claim 1, further comprising a cleaning or water disinfecting tablet receivable in the tool carrier.

19. A kit containing an assembly for cleaning a filter cartridge comprising an elongated tool carrier, a brush formed with plurality of openings extending between rows of bristles, and a nozzle, whereas the brush and the nozzle are selectively coupled to one end of the tool carrier and are in flow communication with a hollow interior of the tool carrier to guide a washing medium to the inner and outer surfaces of the filter cartridge.

20. The kit according to claim 18, further comprising at least one cleaning and water disinfecting tablet.

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