An improved plumbing component is disclosed. The plumbing component includes a basket strainer includes a basket strainer body and a tail piece extending therefrom. The tailpiece includes sufficient spacing between the lower aspect of basket strainer body and the upper aspect of tailpiece to support one or more shaped tool-engaging flats, for receiving a wrench tool for assembly/disassembly of the installed apparatus. According to another embodiment, a retrofitable tailpiece having tool-engaging flats may be applied to prior art tailpieces and secured in place to enable single-handed assembly/disassembly.
SINK STRAINER APPARATUS
CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] not applicable

STATEMENT RE: FEDERALLY SPONSORED RESEARCH/DEVELOPMENT:

[0002] not applicable

BACKGROUND OF THE INVENTION

[0003] 1. Field of the Invention

[0004] The present invention relates to plumbing apparatus and systems, and more particularly, to an improved sink strainer apparatus for use with sinks, bathtubs, and other especially deep basin type plumbing fixtures.

[0005] 2. Description of the Related Art

[0006] A problem associated with drain waste lines and related systems arises in the installation or removal of plumbing components utilized with basin-type plumbing fixtures including sinks and bathtubs. Especially with deep basin kitchen sinks and bathtub drain fixtures, these components require separate personnel to secure a tap portion against rotation while a tailpiece located under the basin is tightened into a final secure, leak-free position. Thus, to tighten these plumbing components in place, or to loosen these drain pieces for removal, a plumber’s assistant will use a first tool which is inserted down into the basin drain piece to prevent the upper component from rotation, while the plumber will use a second tool from underneath the plumbing fixture to tighten or loosen the components as required. It is thus apparent that the use of two persons with two separate tools to tighten or loosen these plumbing components is expensive in terms of personnel costs.

[0007] Thus, in addition to the need for a tool to alleviate the problems associated with the installation and removal of plumbing components such as the drain pieces discussed above, there has continued to be a need for a tool to facilitate the tightening and loosening of flanged faucet mounting nuts, flanged drain test plugs, sink basket strainers, and similar pieces or parts, while eliminating the prior art need for additional expensive personnel.

[0008] Various efforts have been made at satisfactorily meeting this need. The drain basket also sometimes termed a “strainer” is a fitting which is secured at the discharge opening in the bottom of a fixture such as a basin, sink or bathtub. The drain basket is typically cup-shaped and is positioned in the drain or outlet of the plumbing fixture and has an external threaded body portion which is in threaded engagement with the drain line. Cross members extend across the bottom of the basket. Removing the basket when plumbing repairs are necessary can be difficult particularly if the basket or strainer has been installed for some period of time and has become rusted. There are various specialized tools in the prior art for removing and installing drain fixtures such as those found in sinks and tubs.

[0009] U.S. Pat. No. D382,788 shows an ornamental design for an alignment tool for installing bathtub drains which has a number of adjustable arms which can be extended to engage the bottom and side walls of the tub. U.S. Pat. No. 4,835,798 shows a centering tool for disposing and maintaining a basket sink strainer in concentric and parallel relationships with respect to the sink drain hole. The tool of the ’798 patent comprises a tubular spider having upper and lower horizontal arms with telescopically extensible tubular elements that are positional to contact the corners of the sink. An adapter depending from the center carries a pronged element that engages the slots in the bottom well of the sink strainer. U.S. Pat. No. 5,103,698 shows a tool for use that is attachable to the drain basket of a sink. The tool has a cylindrical body with lugs projecting longitudinally from one end. The lugs of the tool are shaped in dimension to fit into the drain apertures near the bottom of the cup. There is a radially extending ring around the base. The tool is attached to the external bottom of the drain basket by inserting the lugs through the cup-like portion into the slots and then applying a lower flange around the tool body and threading it onto the lower threaded fitting which extends down from the cup.

[0010] Nevertheless, there exists a need for a tool to assist plumbers in removing drain baskets, which tool is simple to use and effective for the intended purpose.

OBJECTS AND SUMMARY OF THE INVENTION

[0011] Accordingly, it is an object of the present invention to provide an apparatus for enabling a single person to fully assemble/disassemble plumbing components in deep basin plumbing fixtures.

[0012] It is another object of the present invention to provide an apparatus for enabling a single person to fully assemble/disassemble plumbing components in deep basin plumbing fixtures, with positive feedback indicia for indicating complete installation.

[0013] It is a further object of the present invention to provide a improved plumbing component retrofittable with known basin drainage components, for enabling single-person assembly/disassembly thereof.

[0014] It is yet another object of the present invention to provide an improved plumbing component for retrofittable application to a basin drainage system, to be packaged and sold independently for use with existing systems.

[0015] It is a further object of the present invention to provide a hand tool for use in connection with the present invention.

[0016] According to the present invention, an improved sink strainer/basket strainer includes a basket strainer body opening upwardly for optionally receiving in cooperating agreement a common basket strainer or stopper in the concavity provided therein. A lower threaded tailpiece extends downwardly through intermediate extension, that extension having sufficient spacing between the lower aspect of basket strainer body and the upper aspect of tailpiece to support one or more shaped tool-engaging flats, for receiving a wrench tool for assembly/disassembly of the installed apparatus. The tool-engaging flats preferably include sufficient height and clearance to enable access of common tools such as common slip joint pliers, plumbers wrenches and the like. The upper periphery of the basket strainer body supports an outwardly extending flange to be supported on upper surface of a counter top or other mounting surface.
The lower aspect of the tailpiece includes a threaded periphery for connection to a drainpipe as is well known in the prior art. Accordingly, assembly of the inventive apparatus eliminates the need for multiple plumbing personnel, as a simple long handle wrench may be applied to the tool-engaging flats and held in that position by the plumber while he concurrently manipulates the upper basket strainer apparatus and flange to secure it in desired registration relative to the front of the basin in which the apparatus is to be secured.

It should be noted and understood that with respect to the embodiments of the present invention disclosed herein, the materials and apparatus disclosed and suggested may be modified or substituted to achieve the desired protected structures without departing from the scope and spirit of the disclosed and claimed invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an elevational view of a basin such as a deep-basin kitchen sink in an in situ application, showing a sink strainer/basket strainer coupled to a tailpiece in-line with a plumbing waste line.

FIG. 2 is a partial elevational view of a prior art sink strainer shown secured to a cockhole of a mounting substrate.

FIG. 3A is an elevational view of a first embodiment of the improved sink strainer/basket strainer apparatus of the present invention shown in FIG. 1, showing tool-engaging flats formed about a periphery of the tailpiece of the present invention.

FIG. 3B is an elevational view of a second embodiment of the improved sink strainer/basket strainer apparatus of the present invention shown in FIG. 1, showing tool-engaging flats formed on an after-market locker which may then be optionally locked in place about a periphery of the tailpiece of the present invention.

FIG. 4 is an exploded elevational view of a second embodiment of the improved sink strainer/basket strainer apparatus of the present invention.

FIG. 5 is a sectional view taken through line 5-5 of FIG. 4, showing additional structural features of the second embodiment shown in FIG. 4.

FIG. 6 is an elevational view of the first embodiment of the present invention.

FIG. 7 is a detail view of FIG. 6, showing additional structural features of the first embodiment shown in FIG. 6.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawings wherein like numerals designate like and corresponding parts throughout the several views, FIG. 1 shows an elevational view of a basin installation 10 for securing a basin 12 such as a deep-basin kitchen sink in an in vivo application. Basin 12 may be any basin including but not limited to a kitchen basin, bathroom basin such as a bathtub or shower, wash basin or any basin utilizing a sink strainer or basket strainer such as that according to the present invention as will be further described below. Commonly, basin 12 is mounted to a sturdy mounting substrate such as a counter top or cabinetry 14 having support walls 16, 18 or alternatively, as may be supported by legs, brackets or other bracing hardware as will be apparent to the skilled artisan, as well as for supporting water dispensing hardware including a water faucet 20. Common to all of these applications, however, is the need, especially with deep basin kitchen sinks and bathtub drain fixtures, for employing additional plumbing personnel to secure a top portion basket strainer against rotation while a tailpiece located under the basin ofFIG. 1. Further into a final secure, leak-free position, as well as to assure desired registration of visible markings and ornamentation on the upper flange surface in the fully installed position.

With reference now to FIG. 2, the prior art apparatus 30 includes mounting substrate such as a counter top 32 for supporting prior art sink strainer 33 having a basket strainer body 34 opening upwardly for optionally receiving in cooperating agreement a common basket strainer (not shown) in the concavity provided therein, the upper periphery of the basket strainer body 34 supporting an outwardly extending flange 36 supported on upper surface of counter top 32. A vertical aspect of the outer peripheral surface of basket strainer body 34 below the flange 36 is threaded to receive a locking ring 39 for urging the flange against the counter top 32, while simultaneously urging a sealing ring 39a into a leakproof position between the upper surface of the locking ring 39 and the lower surface of the counter top 32 to provide a secure, stable, leakproof installation. Prior art sink strainer 33 further includes a threaded tailpiece 35 extending immediately from and below the basket strainer body 34, for receiving therein a lower drainpipe inlet to be secured thereto with a locking ring 40. As such, it will be appreciated that especially in a deep basin applications, assembly and tightening so as to achieve these multiple leak free fittings while also attempting desired registration of upper flange embellishments in a desired orientation becomes a daunting task.

In an effort to overcome these prior art problems, and with reference now to FIGS. 3A and 3B, according to one embodiment of the present invention, sink strainer/basket strainer 40 includes a basket strainer body 42 opening upwardly for optionally receiving in cooperating agreement a common basket strainer (not shown) in the concavity provided therein. A lower threaded tailpiece 44 extends downwardly through intermediate extension 50, that extension 50 having sufficient spacing between the lower aspect of basket strainer body 42 and the upper aspect of tailpiece 44 to support one or more shaped tool-engaging surfaces or features 52, such as flats 52, for receiving a wrench tool for assembly/disassembly of the installed apparatus. Tool-engaging features 52 preferably include sufficient height (plus/minus 3/16 inch) and clearance to enable access of common tools such as common slip joint pliers, plumbers wrenches and the like. It is further contemplated that features 52 may include outwardly extending tabs for enabling tool-less manual manipulation of the apparatus during assembly and disassembly, although with provision for tools in the manner described above.

The upper periphery of the basket strainer body 42 supports an outwardly extending flange 46 to be supported on upper surface of a counter top or other mounting surface in the manner previously described 32. Further the lower aspect 54 of tailpiece 44 includes a threaded periphery for
connection to a drainpipe in the manner previously described in connection with the prior art description of FIG. 2. With reference to FIG. 3B, a separate annular ring 53 having tool receiving flats 55 is secured to the tailpiece 44 with a threaded engagement to an upper extent of tailpiece 44. According to an embodiment of the invention, the tailpiece is either snugly tightened against the underside of the basket strainer body 42 by applying a complementary shaped tool to flats 55 and/or secured in a desired location along the length of the tail piece 44 with a metal or polymeric adhesion means, including by way of example only, a liquid adhesive have a cured shear strength sufficient to create and maintain at least during installation a joint sufficient to withstand a torsional resistance necessary to achieve a watertight installation of the assembly of the tail piece extension and basket strainer within a cockhole of the sink in which the assembly is to be installed. No matter which embodiment of the invention is utilized, it will be appreciated that the tool flats may also be provided at a radius greater than the outer thread of the tail piece to which the invention is installed. Accordingly, assembly of the apparatus 40 eliminates the need for multiple plumbing personnel, as a simple long handled wrench may be applied to flats 52 and held in that position by the plumber while he/she concurrently manipulates the upper basket strainer apparatus 42 and flange 46 to secure it in desired registration relative to the front of the basin in which the apparatus is to be secured.

[0030] Attention is now directed to another embodiment of the present invention, shown in FIGS. 4-5. According to this embodiment, a prior art basket strainer 33 may be retrofitted by affixing an retrofit tailpiece 60 to existing tailpiece 35 of the prior art apparatus. Retrofit tailpiece 60 includes a length of threaded conduit 62 having a lower terminus for being secured to an in situ plumbing application in the manner previously described. Importantly upper terminus of tailpiece 60 supports a connector 64 for sealing engagement with tailpiece 35 of the prior art apparatus. Connector 64 incorporates tool engaging portion 66 including but not limited to tool engaging flats 68 for use in the manner previously described, and it will be appreciated that this innovative apparatus may be provided separately or in combination with prior art basket strainer apparatuses for providing the plumber with the option of single-person installation.

[0031] With reference now to FIGS. 6-7, a further embodiment of the present invention is shown. According to the invention, basket strainer apparatus 70 has a bowl portion 72 transitioning to tailpiece 74. One or more tool engaging flats 78 may be machined into the outer periphery of tailpiece 74 as necessary and desired to support a tool in the manner that enables single plumbing personnel to assemble/disassemble basket strainer apparatus 70 in the manner previously described, to enable secure, leak-free installation while assuring proper and desired registration of the upper flange 76 within the basin.

[0032] It is to be understood that the present invention is not limited to the embodiments described above, but encompasses any and all embodiments within the scope of the following claims.

What I claim is:

1. An improved basket strainer supported by a flange engagable with a sink, comprising:
   a basket strainer body for receiving a fluid flow;
   a tail piece extending from the basket strainer body for conducting the fluid flow therethrough; and
   a tool engaging feature provided about a periphery of the tail piece.

2. The improved basket strainer as recited in claim 1, wherein the tool engaging feature includes at least one pair of diametrically opposed tool engaging flats.

3. The improved basket strainer as recited in claim 1, wherein the tool engaging feature is provided about an upper extent of the tail piece adjacent a lower portion of the basket strainer body.

4. The improved basket strainer as recited in claim 1, further comprising a transition section between the basket strainer body and the tail piece, the tool engaging feature being supported on the outer periphery of the transition section.

5. The improved basket strainer as recited in claim 4, wherein the tool engaging feature is a tool engaging flat.

6. The improved basket strainer as recited in claim 1, wherein the tool engaging feature is integrally formed with the tail piece.

7. The improved basket strainer as recited in claim 1, wherein the tool engaging feature is adapted to receive a complimentary-shaped wrench head.

8. The improved basket strainer as recited in claim 1, wherein the tool engaging feature is provided separate from the tail piece adapted for engagement therewith.

9. The improved basket strainer as recited in claim 8, wherein the tool engaging feature is comprised of an annulus having an outer surface having at least one pair of diametrically-opposed tool-engaging flats.

10. The improved basket strainer as recited in claim 8, wherein the tool engaging feature includes a threaded region for engaging with a complimentary shaped threaded region along an extent of the tail piece.

11. The improved basket strainer as recited in claim 10, wherein the tool engaging feature may be permanently secured at a peripheral extent of the tail piece.

12. An improved basket strainer, comprising:
   a basket strainer body for receiving a fluid flow;
   a tail piece extending from the basket strainer body for conducting the fluid flow therethrough; and
   a tool engaging feature provided at an upper extent of the tail piece, the tool engaging feature having at least one pair of diametrically opposed tool engaging flats formed about a periphery of the tail piece.

13. The improved basket strainer as recited in claim 12, wherein the tool engaging feature is integrally formed with the tail piece.

14. The improved basket strainer as recited in claim 12, wherein the tool engaging feature is provided separate from the tail piece adapted for engagement therewith.

15. The improved basket strainer as recited in claim 14, wherein the tool engaging feature is comprised of an annulus having a radially outer surface having at least one pair of diametrically-opposed tool-engaging flats, and a radially
inner threaded region for engaging with a complimentary shaped threaded region along an extent of the tail piece.

16. An improvement for a basket strainer, the basket strainer having a basket strainer body for receiving a fluid flow, and a tail piece extending from the basket strainer body for conducting the fluid flow therethrough, the improvement comprising:

a tail piece extension having upper and lower threaded engagement regions, the upper threaded engagement region supporting a locking ring for engaging a lower extent of the tail piece, the locking ring further including a tool engaging feature having at least one pair of diametrically opposed tool engaging flats, the lower threaded engagement region supporting a drain pipe locking ring.

17. The improvement as recited in claim 16, wherein the locking ring may be permanently secured at a peripheral extent of the tail piece to create a joint sufficient to withstand a torsional resistance necessary to achieve a watertight installation of the assembly of the tail piece extension and basket strainer within a cockhole to which the assembly is to be installed.

18. The improvement as recited in claim 16, wherein the tool engaging feature is adapted to receive a complimentary-shaped wrench head.

19. The improvement as recited in claim 16, wherein the tool engaging feature includes a plurality of diametrically-opposed tool-engaging flats.

20. A kit, comprising:

a basket strainer having a basket strainer body for receiving a fluid flow, and a tail piece extending from the basket strainer body for conducting the fluid flow therethrough; and

a tail piece extension having upper and lower threaded engagement regions, the upper threaded engagement region supporting a locking ring for engaging a lower extent of the tail piece, the locking ring further including a tool engaging feature having at least one pair of diametrically opposed tool engaging flats.

* * * * *