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(54) **DRAIN TRAP APPARATUS**

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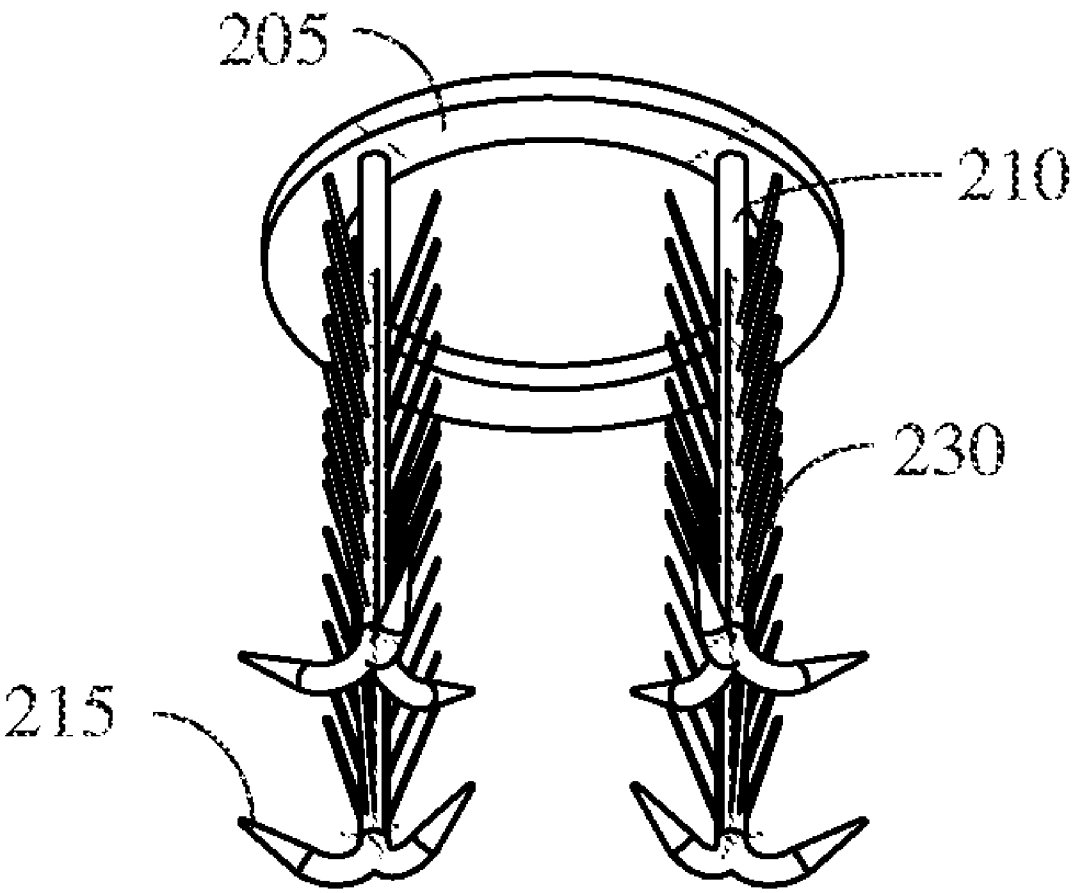
(57) **ABSTRACT**

There is provided herein a plug-type apparatus that is suitable for insertion into a drain proximate to its upper extent. In an embodiment the apparatus has a support member that contains a central aperture to allow sized to allow a threaded shaft to pass therethrough. Additionally, according to some variations there will be one or more descending legs that are adapted to engage and hold debris that otherwise would pass through to the plumbing and potentially clog it. In some embodiments each leg will be terminated in one or more upturned catch members. In other embodiments, each leg will have multiple linear or curved catch members that are designed to engage and secure foreign objects that otherwise would pass into the drain.



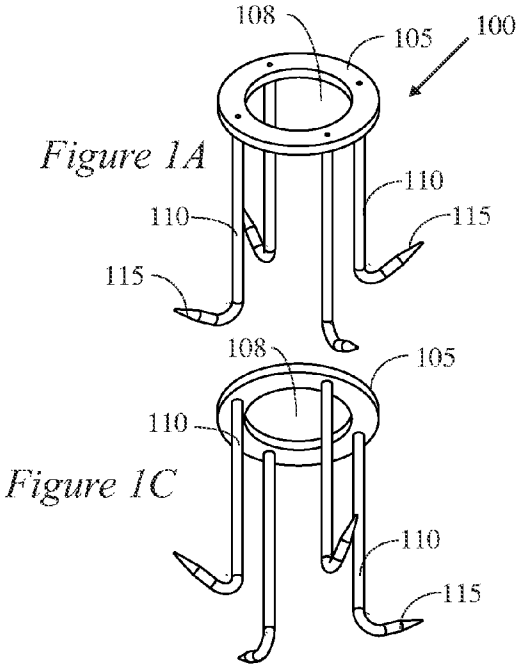


Figure 1A

Figure 1C

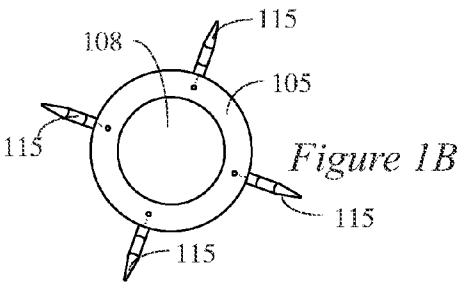


Figure 1B

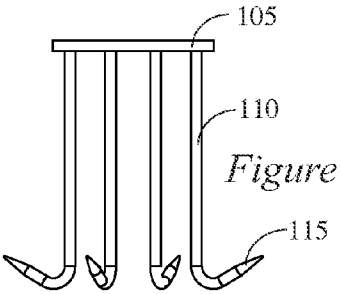


Figure 1D

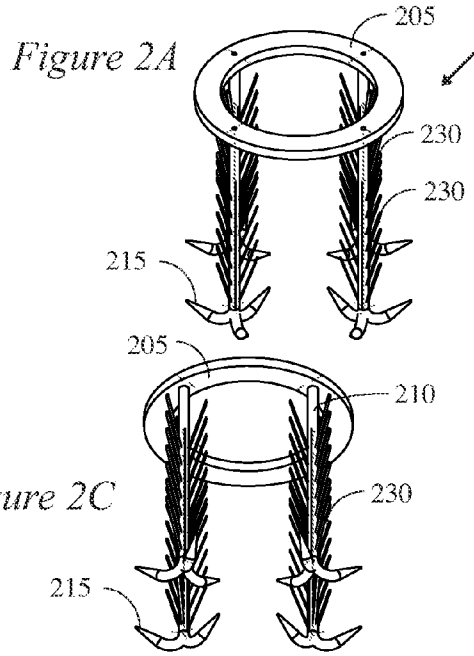


Figure 2A

Figure 2C

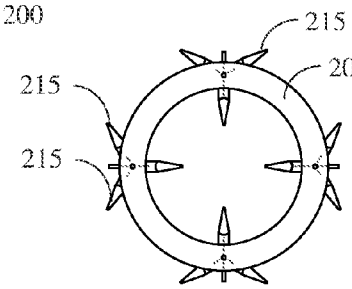


Figure 2B

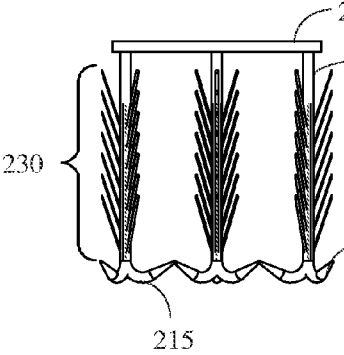


Figure 2D

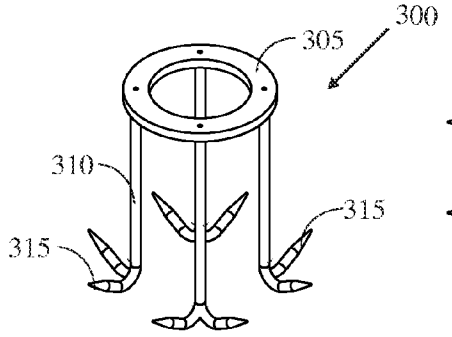


Figure 3A

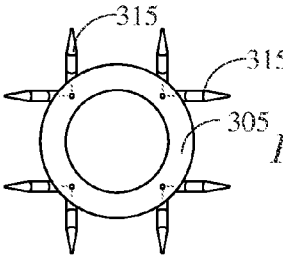


Figure 3B

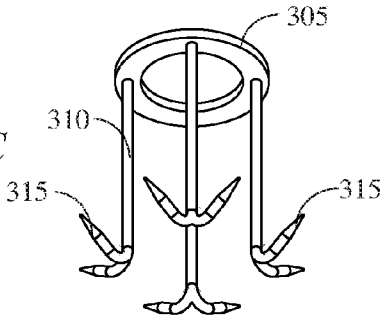


Figure 3C

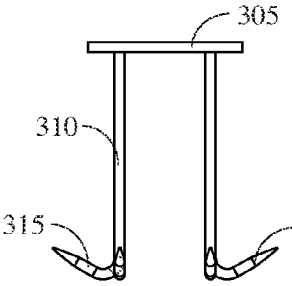


Figure 3D

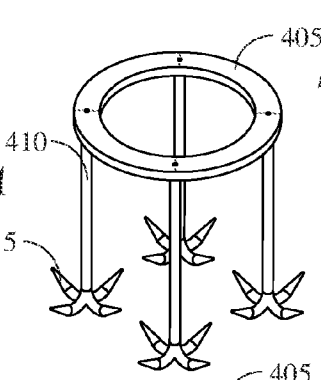


Figure 4A

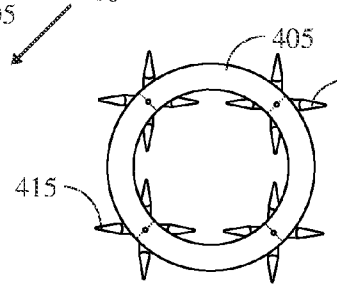


Figure 4B

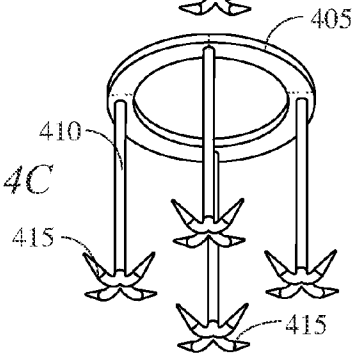


Figure 4C

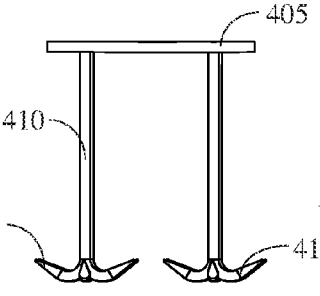


Figure 4D

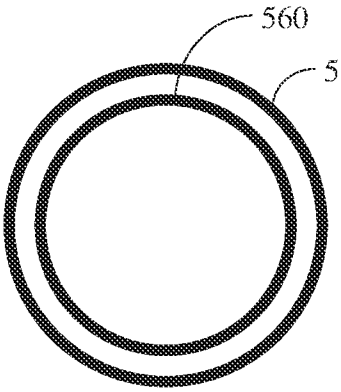


Figure 5A

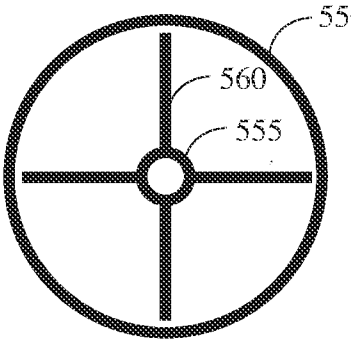


Figure 5B

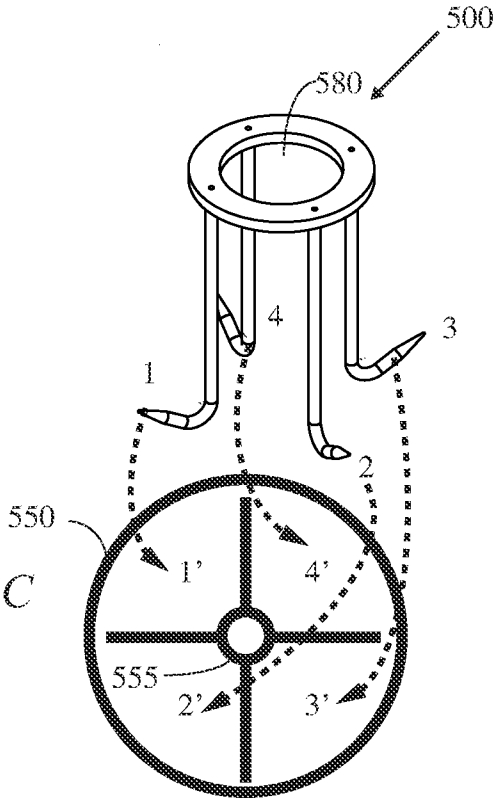


Figure 5C

DRAIN TRAP APPARATUS

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Patent Application Ser. No. 61/035,549 filed on Aug. 11, 2014, and incorporates said provisional application by reference into this document as if fully set out at this point.

TECHNICAL FIELD

[0002] This disclosure relates generally to stoppers for use in drains and, more specifically, to stoppers and other devices for catching foreign objects and preventing them from entering the attached plumbing, e.g., a drain pipe.

BACKGROUND

[0003] Over time, hair and loose foreign objects start to build up inside of the drain, causing water drainage to slow down or stop all together. It is well known that humans and other mammals shed hair continuously. Of importance for the instant disclosure is the well-known fact that human hair, especially when combined with soap scum, can accumulate in a drain and, if left unattended, retard or block the flow of water exiting a sink, tub, etc.

[0004] Long hair of the sort often worn by either gender can be especially problematic since it is readily tangled within the plumbing. Such tangles then tend to plug up bathtub and other drains which leads to a call to a plumber or requires a self-help approach that involves time and sometimes additional expense (e.g., if a clog removing chemicals must be purchased). In some cases, the hair can be removed manually using a drain snake or other mechanical means. But, however the clog is eliminated, such elimination requires time and effort.

[0005] Thus what is needed is a means of addressing this problem that does not suffer from the disadvantages of the prior art.

[0006] Before proceeding to a description of the present invention, however, it should be noted and remembered that the description of the invention which follows, together with the accompanying drawings, should not be construed as limiting the invention to the examples (or embodiments) shown and described. This is so because those skilled in the art to which the invention pertains will be able to devise other forms of this invention within the ambit of the appended claims.

SUMMARY

[0007] According to an embodiment, there is provided an apparatus for intercepting hair and other debris that would otherwise be drained from a basin, sink, tub, etc., before such can pass into the plumbing and potentially retard or block the flow of water through the associated pipe.

[0008] According to an embodiment there is provided a plug-type apparatus that is suitable for insertion into a drain proximate to the drain's upper extent/terminus and that acts to collect debris before they can pass into the plumbing which they will likely result in a clogged pipe. In an embodiment the apparatus has a support member surface that contains a central aperture to which are joined some number of downward extending legs that contain one or more catching members, the catching members being designed to ensnare objects such as hair that are carried by water into the drain. In some embodiments the aperture will be used to allow a threaded shaft of a drain plug to be mated with a corresponding tapped hole in a drain stopper (e.g., a pop-up stopper, a lift-and-turn stopper, etc.) or the similar hole in the cross members that are found within some drains. In other embodiments, the central aperture will be sized to allow water to pass therethrough. More generally, in some embodiments the support member will contain one or more descending legs that include some number of linear or curved catch members that extend therefrom, in some instances they will be situated at a location proximate to the terminus of each of leg. A function of the catch members will be to snare hair and other debris before such pass deeper into the plumbing.

[0009] Further, an embodiment will be designed to be easily removed from the drain mouth. In some embodiments it will be held in place by gravity. In other embodiments, when the drain plug threaded shaft is mated with the tapped hole in the drain plug through the support member aperture, such will secure the instant embodiment in place.

[0010] Embodiments of this device will be configured to catch hair before it goes down in the drain and forms an inaccessible blockage. In some embodiments, the device will be readily extracted from its position in the mouth of the drain by pulling it out and either throwing it away or cleaning it and placing it back into the drain. This will help avoid the inconvenience of a drain or other pipe that has been blocked by an accumulation of hair.

[0011] The foregoing has outlined in broad terms some of the more important features of the invention disclosed herein so that the detailed description that follows may be more clearly understood, and so that the contribution of the instant inventors to the art may be better appreciated. The instant invention is not to be limited in its application to the details of the construction and to the arrangements of the components set forth in the following description or illustrated in the drawings. Rather, the invention is capable of other embodiments and of being practiced and carried out in various other ways not specifically enumerated herein. Finally, it should be understood that the phraseology and terminology employed herein are for the purpose of description and should not be regarded as limiting, unless the specification specifically so limits the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] These and further aspects of the invention are described in detail in the following examples and accompanying drawings.

[0013] FIGS. **1**A-**1**D illustrate various views of an embodiment which includes a single hook on the lower end of each leg.

[0014] FIGS. **2**A-**2**D illustrate various views of an embodiment wherein each leg includes upward angling terminus catch member in combination with a plurality of auxiliary catchers.

[0015] FIGS. **3**A-**3**D contain various views of an embodiment which includes multiple terminal hooks on each leg.

[0016] FIG. **4**A-**4**D contain illustrations of another embodiment which contains four terminal hooks.

[0017] FIGS. **5**A-**5**C illustrate how an embodiment might be used in practice.

DETAILED DESCRIPTION

[0018] While this invention is susceptible of embodiment in many different forms, there is shown in the drawings, and

will herein be described hereinafter in detail, some specific embodiments of the instant invention. It should be understood, however, that the present disclosure is to be considered an exemplification of the principles of the invention and is not intended to limit the invention to the specific embodiments or algorithms so described.

[0019] Turning to the figures, in each of FIGS. **1**A-**1**D, **2**A-**2**D, **3**A-**3**D, and **4**A-**4**D are prevented four views of various embodiments that are consistent with the disclosure presented herein: a perspective view from the top (A), a plan view (B), a perspective view from below (C), and a side view (D). In some cases, there may be different sizes of embodiments to accommodate different sizes of drains and the associated drainage pipes/plumbing (e.g., one that is sized to fit inside of a tub drain and one that is sized to fit inside of a sink drain). In other embodiments, the embodiment might be configured with a solid top/support member to operate as a drain stopper that could be raised to allow water to escape and lowered to allow water to accumulate in replacement for the conventional stopper.

[0020] Turning generally to the figures, certain embodiments have a support member that includes one or more downwardly extending legs attached thereto where each leg includes at least one outwardly extended catch member that is preferably situated proximate to its lower terminus and which is designed to catch and retain solid matter such as hair which would otherwise pass into the drain trap or elsewhere and potentially cause a blockage in the plumbing which the drain is in fluid communication with. In some embodiments the catch members will be upwardly turned to assist in retaining the caught material until the instant invention can be removed from the drain for cleaning or disposal.

[0021] More generally, in some embodiments the inventive device will be sized to allow the water to flow freely past it but contain some number of linear or curved catch members from each of its legs that are designed to catch hair and other debris. In some embodiments, a central aperture within the support member will be sized so that the drain stopper can pass through it and screw back into place.

[0022] Turning now to FIGS. **1**A-**1**D, this embodiment **100** has a ring **105** which contains a central aperture which, in some embodiments, allows water to pass therethrough. In other embodiments, the central aperture **108** will be sized to be at least larger than a tapped hole in the upper terminus of, for example, a stopper of a drain, e.g., so that a drain plug that has a threaded shaft on its underside can pass therethrough and mate with the tapped hole to secure the drain plug in place after this embodiment **100** has been placed within the drain. One type of stopper that would work well with this embodiment is the sort of pop-up stopper that is conventionally used in connection with a sink or tub. That being said, the instant invention is well suited to use with any type of drain and stopper. Those of ordinary skill in the art will be well able to adapt the instant invention to other configurations based on the concepts presented herein.

[0023] In some embodiments the diameter of the ring **105** will be slightly less than the diameter of the drain pipe so that water that is passing into the drain will both flow through the aperture and outside of/around it. Note that, although the term "ring" has been used above, it should be understood that neither the upper or lower surface needs to be flat and, instead, could be patterned, rounded, notched, etc., according to the needs of the designer. Nor does the support member need to be circular in shape, although that might be preferred in many applications. Further, some embodiments might utilize a solid support surface which does not contain an aperture, in which case the embodiment might be held in place by gravity. Other embodiments might simply configure the support surface to take the form of the bent extensions of the legs that are joined together in some fashion in the middle (e.g., with or without a central aperture) so that the legs are supported by a frame only. Thus, when the term "support surface" is used in the claims that follow, that term should be broadly construed to include, without limitation, the examples discussed previously.

[0024] As mentioned previously, the central aperture **108** may be eliminated so that water is diverted to flow down the outer edge of the ring **105**. As can be seen, there will be some number (one or more) legs **110** that extend downwardly (in the orientation of FIG. **1**) from the ring and that include a catch member **115** which might be situated near the unattached terminus of the leg **110**. As is indicated in this figure, the catch member **115** might be somewhat slightly inclined, substantially inclined, or horizontal, etc. All that is required is that it extend away from the legs (either toward the wall of the drain or toward its center) in such a way as to allow the passage of water but be in a position to catch debris carried thereby.

[0025] Turning next to FIGS. **2**A-**2**D, in this embodiment **200** the ring **205** has legs **210** that are covered with some number of catching bristles **230** which, in this embodiment, are upwardly angled at an acute angle with respect to the leg **210** to which each is attached. As before, in this example proximate to the lower terminus of the leg is a three pronged catch member **215**. In this case the catch member has three extensions **215** per leg. In some embodiments the material of the bristles **230** will the same as that of the leg **210** and/or catch member but, clearly, they could be made of a different material. Additionally, and as can be seen, in some embodiments a catch member **215** might have extensions that are oriented toward the interior of the drain.

[0026] In FIGS. **3**A-**3**D there is an embodiment **300** that has catch members **315** with two extensions per leg **310**. As before, there is a support member that takes the form of a ring **305** that supports the legs **310** within the drain.

[0027] Turning next to FIGS. **4**A-**4**D, this embodiment **400** contains a support member in the shape of a ring **405** that supports legs **410** that are terminated in catch members **415** that have four horizontally extending extensions.

[0028] Finally, and with respect to FIGS. **5**A-**5**C, this figure indicates in a general way how an embodiment **500** might fit within a conventional round drain in practice, where the drain mouth **560** has a stopper **550** situated therein. In this embodiment, the stopper **560** (viewed from above) can be raised and lowered within the drain mouth **550** by rotating it, thereby causing a threaded shaft or similar construct on its underside (not shown) to engage a tapped hole **570** which is supported within the drain pipe by cross members **565**. As is conventionally the case, this permits the stopper to trap and release water from the container drained by the drain mouth **560**. It also permits the drain plug **560** to be removed completely (FIGS. **5**B and **5**C). This embodiment **500** will be placed within the drain mouth **550** with its central aperture **580** position above the tapped hole **570** so that the drain plug **560** may be thereafter reengaged the tapped hole **555**. As is indicated legs labeled **1** to **4** are placed within quadrants **1'** to **4'** respectively of the drain mouth **550**.

[0029] In some embodiments, the device will have a toroidal support surface that is designed to conform to and fit within a conventionally encountered round drain. Of course, the shape of this component is not critical but in most embodiments it will be designed to fit within conventional plumbing and, thus, will most often be round. The central aperture of the torus is one which is designed to allow the passage of water around and through it when the drain plug is not engaged. In some embodiments its upper surface will be circular (hence, the toroidal shape) but that also is not required. The central aperture should be sized to allow water to drain through it at a rate that is acceptable to a user. In some embodiments the device will be sized so that water can flow freely around and through it, with the one or more linear or curved catch members from each of its legs being arranged to catch hair and other debris that would otherwise be carried by the water into the drainpipe. In some embodiments, the aperture will be sized so that the drain stopper can pass through its central aperture and be screwed into place. FIGS. **15**A-**15**C illustrate one such embodiment.

[0030] Some embodiments will be made out of material that does not rust such as stainless steel, aluminum or plastic. Other embodiments could be made of any sort of material, in some cases it might be coated so as to prevent rust or other sorts of corrosion that might occur from contact with the water and other materials that might be found within a sink or tub. For example, in some cases a metal device could be used that is covered with a plastic or rubber coating on it to prevent corrosion. The inventive device can either be disposable or it could be designed to be removed, cleaned, and reinserted into the drain.

[0031] One advantage that some embodiments made according to the instant disclosure might have over other devices is that they can be placed in drains where they are hidden from immediate view and, thus, can be made to be largely unnoticeable if that is desired. This is unlike most other products of this type which would be configured to be situated outside of the drain. Of course, situating a device external to the drain means that it can potentially be dislodged by an errant foot or by other means.

[0032] That being said, in some embodiments the support member might be sized to be larger than the drain mouth and rest atop it with legs that extend downward along the outer perimeter of the drain, and the catching members extending inwardly away from the wall of the drain and toward its center. In this embodiment, it would be beneficial, but not required, that the support member have a low profile so as to not interfere with normal use of the sink, tub, etc.

[0033] Another advantage is that an embodiment will sit inside the drain shaft and will not be visible until it is ready to be cleaned as evidenced by a slowdown in the flow of water out of the basin or tub. Embodiments of the inventive drain trap can also function as normal drain stopper, being able to open and close to respectively trap and release water. Other embodiments will fit within the drain beneath a conventional drain plug and, in some cases, allow the plug to be mechanically connected through the embodiment's central aperture to a mechanical or other closure mechanism.

[0034] It is to be understood that the terms "including", "comprising", "consisting" and grammatical variants thereof do not preclude the addition of one or more components, features, steps, or integers or groups thereof and that the terms are to be construed as specifying components, features, steps or integers.

[0035] If the specification or claims refer to "an additional" element, that does not preclude there being more than one of the additional element.

[0036] It is to be understood that where the claims or specification refer to "a" or "an" element, such reference is not be construed that there is only one of that element.

[0037] It is to be understood that where the specification states that a component, feature, structure, or characteristic "may", "might", "can" or "could" be included, that particular component, feature, structure, or characteristic is not required to be included.

[0038] Where applicable, although state diagrams, flow diagrams or both may be used to describe embodiments, the invention is not limited to those diagrams or to the corresponding descriptions. For example, flow need not move through each illustrated box or state, or in exactly the same order as illustrated and described.

[0039] Methods of the present invention may be implemented by performing or completing manually, automatically, or a combination thereof, selected steps or tasks.

[0040] The term "method" may refer to manners, means, techniques and procedures for accomplishing a given task including, but not limited to, those manners, means, techniques and procedures either known to, or readily developed from known manners, means, techniques and procedures by practitioners of the art to which the invention belongs.

[0041] For purposes of the instant disclosure, the term "at least" followed by a number is used herein to denote the start of a range beginning with that number (which may be a ranger having an upper limit or no upper limit, depending on the variable being defined). For example, "at least 1" means 1 or more than 1. The term "at most" followed by a number is used herein to denote the end of a range ending with that number (which may be a range having 1 or 0 as its lower limit, or a range having no lower limit, depending upon the variable being defined). For example, "at most 4" means 4 or less than 4, and "at most 40%" means 40% or less than 40%. Terms of approximation (e.g., "about", "substantially", "approximately", etc.) should be interpreted according to their ordinary and customary meanings as used in the associated art unless indicated otherwise. Absent a specific definition and absent ordinary and customary usage in the associated art, such terms should be interpreted to be ±10% of the base value.

[0042] When, in this document, a range is given as "(a first number) to (a second number)" or "(a first number)-(a second number)", this means a range whose lower limit is the first number and whose upper limit is the second number. For example, 25 to 100 should be interpreted to mean a range whose lower limit is 25 and whose upper limit is 100. Additionally, it should be noted that where a range is given, every possible subrange or interval within that range is also specifically intended unless the context indicates to the contrary. For example, if the specification indicates a range of 25 to 100 such range is also intended to include subranges such as 26-100, 27-100, etc., 25-99, 25-98, etc., as well as any other possible combination of lower and upper values within the stated range, e.g., 33-47, 60-97, 41-45, 28-96, etc. Note that integer range values have been used in this paragraph for purposes of illustration only and decimal and fractional values (e.g., 46.7-91.3) should also be understood to be intended as possible subrange endpoints unless specifically excluded.

[0043] It should be noted that where reference is made herein to a method comprising two or more defined steps, the defined steps can be carried out in any order or simulta-

neously (except where context excludes that possibility), and the method can also include one or more other steps which are carried out before any of the defined steps, between two of the defined steps, or after all of the defined steps (except where context excludes that possibility).

[0044] Further, it should be noted that terms of approximation (e.g., "about", "substantially", "approximately", etc.) are to be interpreted according to their ordinary and customary meanings as used in the associated art unless indicated otherwise herein. Absent a specific definition within this disclosure, and absent ordinary and customary usage in the associated art, such terms should be interpreted to be plus or minus 10% of the base value.

[0045] Still further, additional aspects of the instant invention may be found in one or more appendices attached hereto and/or filed herewith, the disclosures of which are incorporated herein by reference as if fully set out at this point.

[0046] Thus, the present invention is well adapted to carry out the objects and attain the ends and advantages mentioned above as well as those inherent therein. While the inventive device has been described and illustrated herein by reference to certain preferred embodiments in relation to the drawings attached thereto, various changes and further modifications, apart from those shown or suggested herein, may be made therein by those of ordinary skill in the art, without departing from the spirit of the inventive concept the scope of which is to be determined by the following claims.

What is claimed is:

1. A debris catching apparatus for use in a drain, comprising:

a. a support member adapted to be positioned within a drain; and,

b. one or more downwardly extending legs affixed to said support member, each of said one or more legs having at least one outwardly extending catching member.

2. A debris catching apparatus, according to claim **1**,

wherein each of said one or more legs has an upper end and a lower end,

wherein each of said legs is affixed at said upper end to said support member, and,

wherein each of said at least one outwardly extending catching member is situated proximate to said lower end of said leg.

3. A debris catching apparatus, according to claim **1**, wherein each of said at least one catching member is upwardly angled.

4. A debris catching apparatus, according to claim **1**, wherein at least one of said one or more legs has a plurality of catching bristles thereon.

5. A debris catching apparatus, according to claim **4**, wherein each of said plurality of catching bristles is upwardly angled.

6. A debris catching apparatus for use in a drain, comprising:

a. a support member sized to be positionable within a drain mouth; and,

b. one or more downwardly extending legs affixed to an under side of said support member, each of said one or more legs having at least one catching member situated proximate to a terminus thereof.

7. A debris catching apparatus, according to claim **6**, wherein said support member is ring shaped.

8. A debris catching apparatus, according to claim **6**, wherein said at least one catching member is upwardly angled with respect to said leg.

9. A debris catching apparatus, according to claim **6**, wherein at least one of said one or more legs has a plurality of upwardly angled catching bristles thereon.

* * * * *