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(19) **United States**(12) **Patent Application Publication****Parker**(10) **Pub. No.: US 2006/0049085 A1**(43) **Pub. Date: Mar. 9, 2006**(54) **QUICK RELEASE DRAIN FILTER APPARATUS AND SYSTEM****Publication Classification**(76) Inventor: **Todd George Parker**, San Diego, CA (US)(51) **Int. Cl.**
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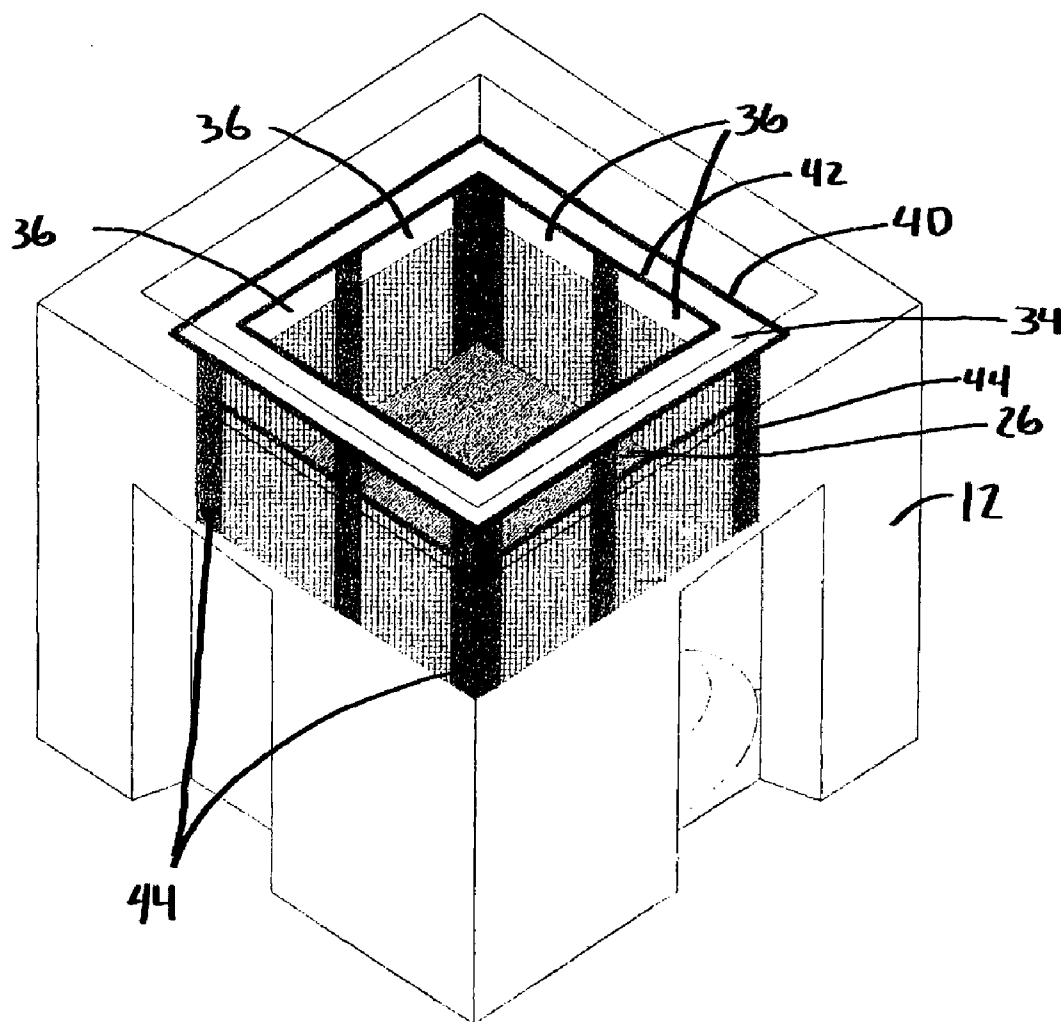
Correspondence Address:

LAW OFFICE OF MICHAEL P. EDDY
12526 HIGH BLUFF DRIVE, STE. 300
SAN DIEGO, CA 92130 (US)(57) **ABSTRACT**

An apparatus and system for a quick release storm drain filter having a filter basket dimensioned to fit within a drain basin forming a reservoir obstructing at least a portion of the basin and a quick release basket support dimensioned and adapted to cooperatively engage with said catch basin and with said filter basket so that the filter basket is substantially maintained in a fixed position within said catch basin. Another embodiment includes a high flow bypass accommodated within the filter basket support that allows excess high volume water flow to pass. Another embodiment further includes a splash ring that directs water flow into and around said drain basin. Another embodiment includes one or more adsorbent containers within or exterior to the filter basket.

(21) Appl. No.: **11/162,405**(22) Filed: **Sep. 8, 2005****Related U.S. Application Data**

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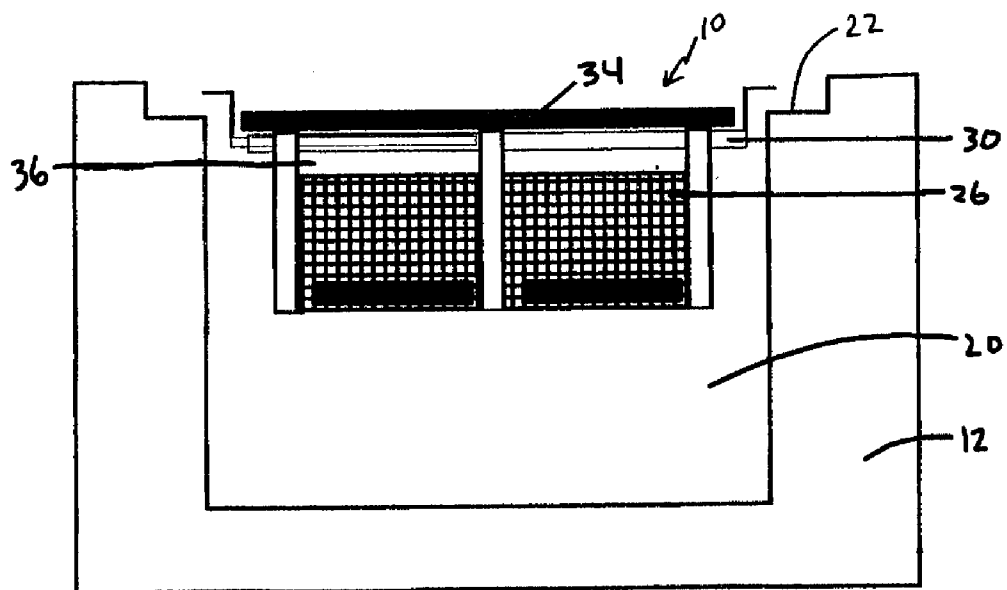


FIG. 1

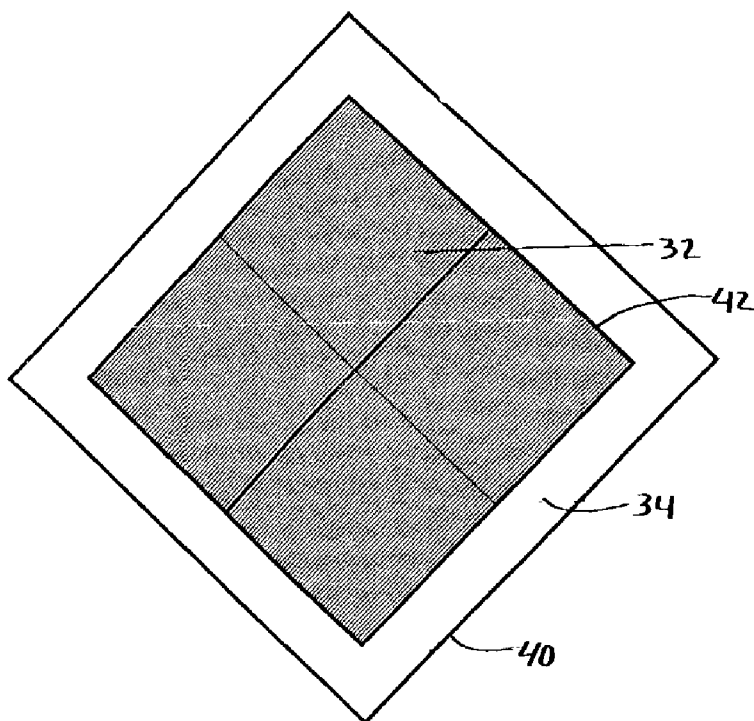


FIG. 2

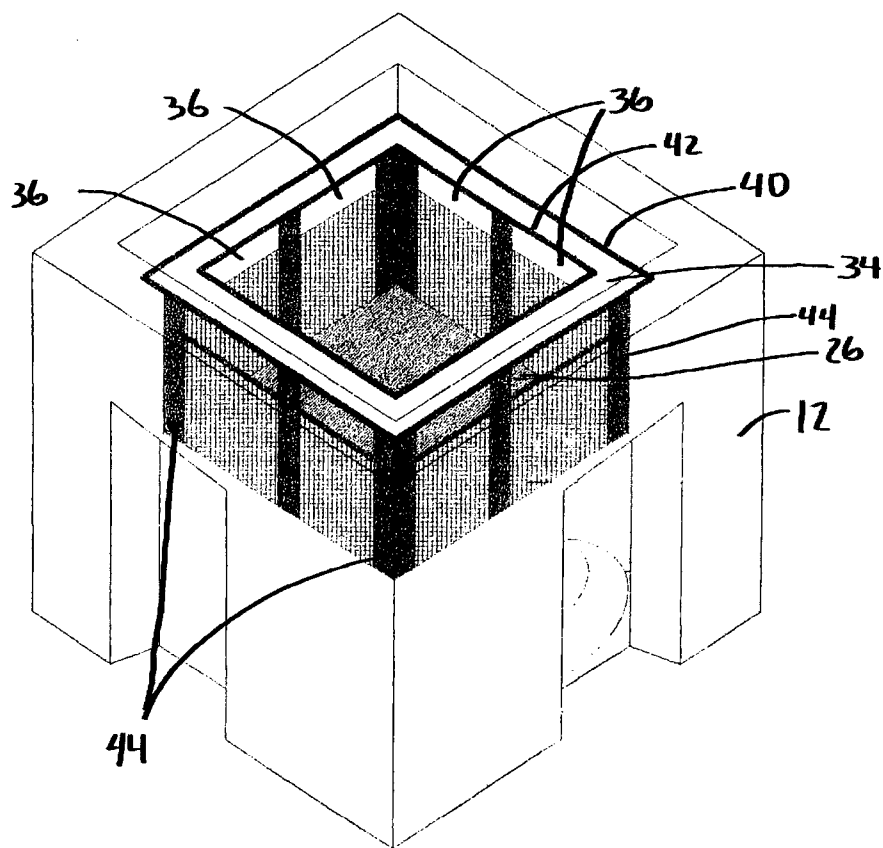


FIG. 3

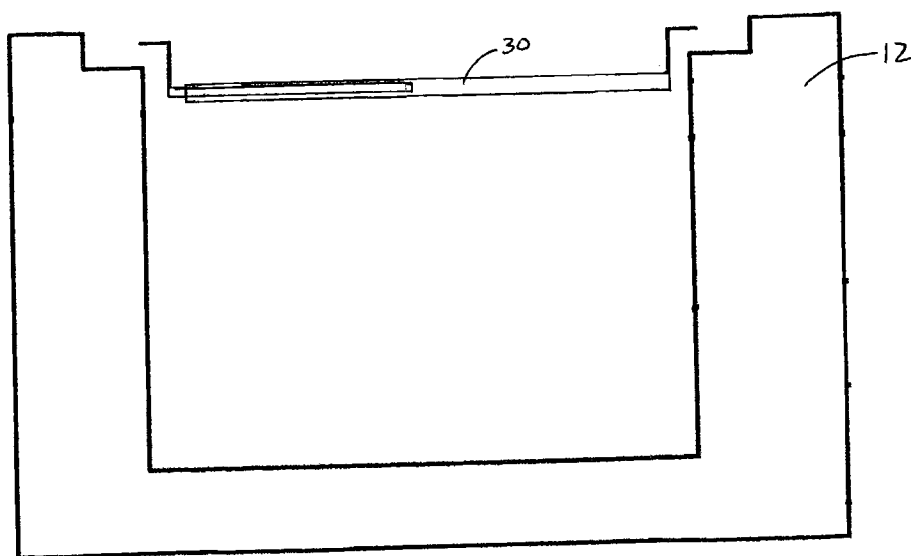


FIG. 4

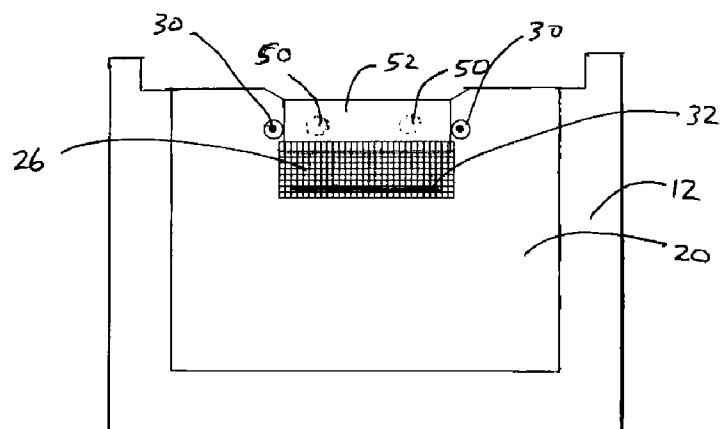


FIG. 5

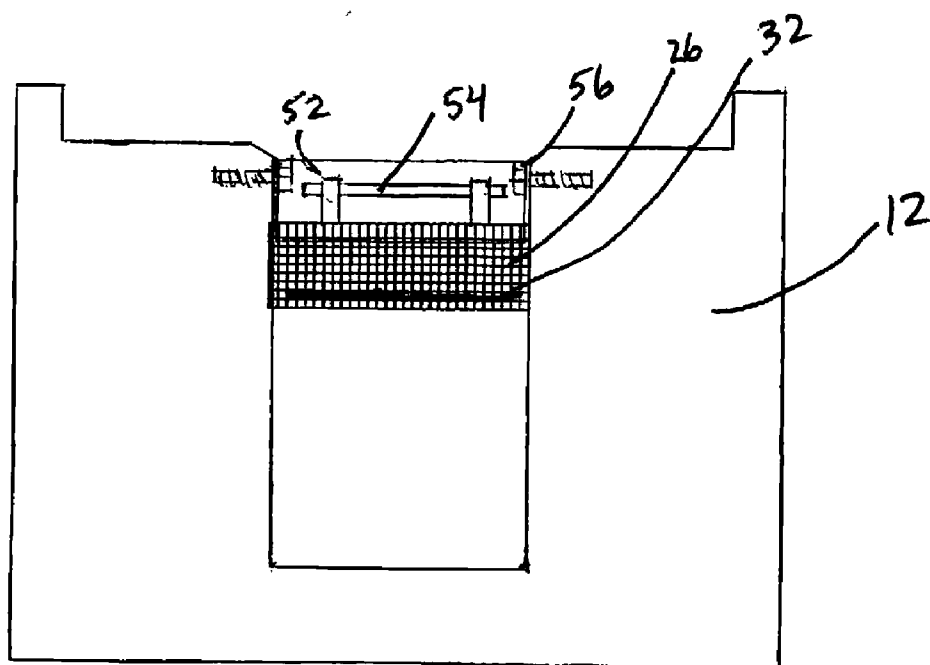


FIG. 6

QUICK RELEASE DRAIN FILTER APPARATUS AND SYSTEM

BACKGROUND

[0001] The present invention relates generally to removable drain filters, more specifically, to an apparatus and a system that aids in the filtration of run off water that flows through storm drains. Storm drains typically contain a catch basin that is situated in-ground and the catch basin is connected to a sewer system with a large diameter pipe. The catch basin is commonly covered with a grate which allows water to flow into the catch basin while preventing large objects from passing into the catch basin and blocking the sewer pipe. Storm drain filter apparatuses and systems are used beneath the grate of the entrance to the storm water catch basin to filter and collect contaminants in the water such as hydrocarbons, sand and other debris so that they are stopped from continuing into the sewer system.

SUMMARY

[0002] The present apparatus and system relate to removable quick release storm drain filter apparatus and system that can be used with in-ground drains. An apparatus and system for a quick release storm drain filter having a filter basket dimensioned to fit within a drain basin forming a reservoir obstructing at least a portion of the basin and a quick release basket support dimensioned and adapted to cooperatively engage with said catch basin and with said filter basket so that the filter basket is substantially maintained in a fixed position within said catch basin. Another embodiment includes a high flow bypass accommodated within the filter basket support that allows excess high volume water flow to pass. Another embodiment further includes a splash ring that directs water flow into and around said drain basin. Another embodiment includes one or more adsorbent containers within or exterior to the filter basket.

BRIEF DESCRIPTION OF THE DRAWINGS

[0003] FIG. 1 is a side planar view of the storm drain apparatus in accordance with one embodiment of the claimed subject matter as used in conjunction with a catch basin;

[0004] FIG. 2 is a top planar view of the storm drain apparatus in accordance with one embodiment of the claimed subject matter;

[0005] FIG. 3 is a perspective view of the storm drain apparatus in accordance with one embodiment of the claimed subject matter as used in conjunction with a catch basin shown in a section view; and

[0006] FIG. 4 is an expanded side planar view of the quick release support member of the storm drain apparatus in accordance with one embodiment of the claimed subject matter.

[0007] FIG. 5 is a side planar view of the quick release drain filter apparatus in accordance with another embodiment of the claimed subject matter.

[0008] FIG. 6 a side planar view of the quick release drain filter apparatus in accordance with another embodiment of the claimed subject matter.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0009] In general, water flows from a water source to the storm drain containing a concrete basin 12. Basin 12 has an open upper end located at grade level, in-ground sidewalls and a floor. A concrete storm sewer pipe extends away from one of the sidewalls of the basin at a distance above the basin's floor. The sidewalls and floor of the catch basin 12 define chamber 20. A recess 22 extends around the inner edge of the top of the catch basin 12, and the sides of a rectangular or other shaped grate fit into the recess 22 allowing the basin 12 to be covered. Run off water normally flows through the grate and into chamber 20 before it exits through the sewer pipe.

[0010] FIGS. 1-5 illustrate various views of the quick release drain filter apparatus 10 constructed in accordance with embodiments of the claimed subject matter. The drain filter apparatus 10 is illustrated as being attached to a drainage catch basin 12 disposed in ground to a street or highway (not shown). The drain filter apparatus 10 may be retrofitted to existing catch basins or it may be installed into newly installed catch basins.

[0011] Referring to FIG. 1 in conjunction with FIG. 2, a first exemplary embodiment is shown with a cement catch basin 12 that lays below the plane of a paved street (not shown) at a point near the street curb. The catch basin 12 has an open top that terminates at street level. A recess 22 is formed on the interior of the catch basin 12 a short distance below the open top of the catch basin 12. Also not shown is a grate that would cover the top of the catch basin 12 typically made of a cast metal and having numerous openings or slats through which water is free to flow.

[0012] In this embodiment (shown in FIGS. 1-4,) the drain filter apparatus 10 is a substantially square member comprised of a disposable filter basket dimensioned to fit within a drain basin forming a reservoir obstructing at least a portion of said basin, a disposable filter basket support dimensioned and adapted to cooperatively engage with said catch basin and with said filter basket so that the filter basket is substantially maintained in a fixed position within said catch basin, a high flow bypass accommodated within said filter basket support that passes excess high volume water flow, and a splash ring that directs water flow into and around said drain basin.

[0013] In the illustrated embodiment, the filter basket 26 is made up of four walls consisting of a plastic or nylon mesh. Filter basket 26 can be made from any suitable material such as a woven plastic fabric, a woven monofilament material, or narrow strips of a polypropylene that are tightly woven together to form a porous fabric. This type of fabric can contain within it absorbent medium 32 and it permits liquid to flow freely through the filter while stopping contaminants. Basket 26 can also be made to accommodate various sized and shaped catch basins and drains. Basket 26, for example, can be made the same length and width as the basin or it can be constructed so that it has a smaller length and/or width than a basin 12.

[0014] As illustrated in FIG. 3, the sidewalls of filter basket 26 are joined together to form a closed area which has four flow bypass openings 30 or apertures located at the top of each of the four basket sidewalls. There can be one or

more flow bypass openings to prevent an excess water flow from clogging the apparatus and catch basin. The high flow bypass **36** allows for high flows to be diverted away from the filter rather than being allowed to clog the drain filter apparatus **10** and catch basin **12**. The high flow bypass can be adjustable in height so that the drain filter apparatus **10** can accommodate higher or lower water flow in circumstances that require more or less use of a high flow bypass.

[0015] Filter basket **26** includes four sidewalls, each of which are located adjacent to one wall of catch basin **12**. Filter basket **26** may also be formed from a single circular sidewall (not shown,) for example to accommodate a basin with circular sidewalls or to accommodate a basin having directed water flow.

[0016] The absorbent medium **32** has lipophilic properties and hydrophobic properties so that it can absorb oil contained in the run-off water passing through the filter basket **26**. An example is polypropylene fibers.

[0017] Any materials that have hydrophobic and lipophilic properties may be used with embodiments of the present invention so that the material used can assist in the removal of oil from the water flow while still allowing the water flow rate to continue through the apparatus **10**. The adsorbent medium **32** is accommodated within the structure of said filter basket **26**. It may also be secured to the floor of said filter basket or it may be attached to the exterior of the filter basket **26**. The adsorbent medium **34** itself may be made up of one or more individual cartridges or packets.

[0018] Referring to FIG. 3, water is directed into the filter apparatus **10** by the splash ring **34**.

[0019] In the illustrated embodiment, the splash ring **34** is a planar square member that is adapted to be placed on recess **22** of the catch basin **12**. It includes exterior gasket **40** and interior gasket **42** so that the ring **34** may substantially seal the upper end of the catch basin **12** to channel water or other liquid passing through the grate into the filter apparatus **10**. The splash ring **34** also keeps an amount of water from splashing around catch basin **12**. The splash ring can be constructed from stainless steel, plastic or any other suitable material, such as woven fabrics, non-woven fabrics, geotextile fabrics, rubber, steel, stainless steel, aluminum, copper, Teflon®, foil, wood, injection-molded plastic, or fiberglass. The gaskets can similarly be constructed out of rubber or any other suitable material. The splash ring **34** can be a square or circular structure formed from ABS plastic or HDPP, vinyl, rubber, plastic, aluminum, steel, fiberglass, copper or nylon.

[0020] The support members hold the filter basket **28** in a substantially fixed position in relationship to the catch basin **12**. Some movement of the basket **28** is normal as water flow will tend to slightly move the basket around in the chamber **20**.

[0021] In the embodiment illustrated in FIGS. 1 to 3, in order to remove the filter basket **26** from the catch basin **12**, the grate is first removed and the tubular bars of support member **30** are moved in an axial direction toward or away from each other allowing the support member **30** and the basket **26** to be lifted up and out of the catch basin **14**. Once the support member **30** and filter basket **26** are removed, the filter basket **26** can be replaced or renovated by using a new cartridge with a new quantity of absorbent medium **32**.

[0022] In use, the drain filter apparatus **10** receives any water that pours through the sewer grate into the basin, and any water entering apparatus **10** will fall either into the filter basket **26** or into the flow bypass **36**. During normal flow conditions, most of the water that passes through the apparatus **10** is filtered by the filter basket **26**. During flood conditions, water is let through the flow bypass **36** unfiltered leaving the flow capacity of the apparatus, catch basin and sewer uncompromised. When the filter basket **26** full or when the basket **26** has completed its useful life for absorbing oils or petroleum product in the water flow, basket **26** may be removed using the quick release support member **30** and a new basket **26** may easily be installed.

[0023] When it is necessary to remove or clean the basket **26**, the support member **30** is used to rapidly disengage the basket **26** from the basin **12** so that the basket **26** can be lifted out of basin **12** and cleaned or replaced with a minimal amount of effort. In one embodiment, the filter basket support member **30** is comprised of two or more rigid tubular sections, but any suitable support elements can be used as a support member **30**. Illustrated in FIG. 4 is support member **30** consisting of two steel tubular sections, the ends of which rest in the recess **22** of the catch basin **12**.

[0024] Support member **30** may also include straps **44** to aid in the support of the filter basket **26**. The support straps **44** can be constructed from nylon or other suitable material, such as cable, wire, plastic, chain, aluminum, copper, steel, rope, cotton, dagron, polyester, Gore-Tex, or rubber. Straps **44** support and reinforce the structure of basket **26** and they may be attached or formed integral to basket **26**. The top end of straps **44** attach to splash ring **34** using a loop or any other suitable means or materials.

[0025] The filter basket **26** can also include a removable oil absorbent medium **32** that may be contained in the structure of filter basket **26**, for example in porous tubes, or it may be placed and secured to the floor of filter basket **26**. The absorbent medium **32** may be made out of any suitable oil absorbing medium, for example amorphous siliceous material. FIG. 2 illustrates the absorbent medium **32** as used on the floor of filter basket **26**. It also illustrates the exterior gasket **40** and the interior gasket **42** of splash ring **34**.

[0026] Referring to FIG. 4, the support member **30** includes two rigid tubular sections which can be adjusted so that they can be easily fit to catch basins of varying size. In this embodiment, support member **30** is made up of two parts or sections comprised of male and female tubular bodies which can be moved axially in relation to each other. In this way, the two sections can be drawn together so that the apparatus **10** can be quickly disengaged and removed from the catch basin **12**. The coupling of the two parts is characterized in that the male part slides inside the female part so that the length of support member **30** can be adjusted to fit the recess **22** of catch basin **12** or it can be adjusted so that it can be easily removed.

[0027] In another embodiment illustrated in FIG. 5, the basket **26** is positioned underneath the grate entrance of catch basin **12**. The support member **30** can be of any suitable material and functions both as a support member to the basket **26** as well as a quick release pin. The support member **30** can also take the form of U shaped or two L shaped retaining elements. The support member **30** may also

be a cord which connects at connecting point **50**. Filter basket housing **52** is connected to the sidewall of basin **12** at connecting point **50** using any suitable fasteners. Elements of the support member **30** as used in the alternative embodiments may be formed from nylon or a comparable material, such as cable, wire, plastic, chain, aluminum, copper, steel, rope, cotton, dagron, polyester, Gore-Tex., or rubber.

[0028] Similarly, in another embodiment illustrated in **FIG. 6**, the basket **26** is positioned underneath the grate entrance of catch basin **12**. Support member **30** is made up of quick release pin **54** attached to a the filter basket housing **52** using pin fasteners **56** at the sidewalls of basin **12**.

[0029] While the present invention has been illustrated and described by means of specific embodiments and alternatives, it is to be understood that numerous changes and modifications can be made without departing from the spirit and scope of the invention. Therefore, it should be understood that the invention is not to be limited in any way except in accordance with the appended claims and their equivalents.

What is claimed is:

1. A drain filter apparatus, comprising:
 - (a) a filter basket dimensioned to fit within a drain basin forming a reservoir obstructing at least a portion of said basin; and
 - (b) a quick release basket support dimensioned and adapted to cooperatively engage with said catch basin and with said filter basket so that the filter basket is substantially maintained in a fixed position within said catch basin.
2. A drain filter apparatus of claim 1, further comprising a high flow bypass accommodated within said filter basket support that passes excess high volume water flow.
3. A drain filter apparatus of claim 1, further comprising a splash ring that directs water flow into and around said drain basin.
4. The drain filter apparatus of claim 3, whereby said high flow bypass is adjustable.
5. The drain filter apparatus of claim 1, further comprising one or more adsorbent containers within said filter basket.
6. The drain filter apparatus of claim 3, wherein said initial high flow bypass is adjustable.
7. The drain filter apparatus of claim 5, wherein said adsorbent medium is comprised of an oil absorbent material.
8. The drain filter apparatus of claim 5, wherein said adsorbent medium is accommodated within the structure of said filter basket.
9. The drain filter apparatus of claim 5, wherein said adsorbent medium is accommodated in a cartridge that is secured to the floor of said filter basket.

10. The drain filter apparatus of claim 1, wherein said filter basket is constructed from the one or more materials in the following group: woven fabrics, non-woven fabrics, geotextile fabrics, rubber, steel, stainless steel, aluminum, copper, Teflon®, foil, wood, injection-molded plastic, a woven monofilament material or fiberglass.

11. The drain filter apparatus of claim 1 wherein said support member and said filter basket are both sized to fit within a storm drain of typical dimensions.

12. A catch basin filtration system, comprising:

- (a) a filter basket dimensioned to fit within a drain basin forming a reservoir obstructing at least a portion of said basin; and
- (b) a quick release basket support dimensioned and adapted to cooperatively engage with said catch basin and with said filter basket so that the filter basket is substantially maintained in a fixed position within said catch basin.

13. A drain filter system of claim 12, further comprising a high flow bypass accommodated within said filter basket support that passes excess high volume water flow.

14. A drain filter system of claim 12, further comprising a splash ring that directs water flow into and around said drain basin.

15. The drain filter system of claim 13, whereby said high flow bypass is adjustable.

16. The drain filter system of claim 12, further comprising one or more adsorbent containers within said filter basket.

17. The drain filter system of claim 13, wherein said initial high flow bypass is adjustable.

18. The drain filter system of claim 16, wherein said adsorbent medium is comprised of an oil absorbent material.

19. The drain filter system of claim 16, wherein said adsorbent medium is accommodated within the structure of said filter basket.

20. The drain filter system of claim 16, wherein said adsorbent medium is accommodated in a cartridge that is secured to the floor of said filter basket.

21. The drain filter system of claim 12, wherein said filter basket is constructed from the one or more materials in the following group: woven fabrics, non-woven fabrics, geotextile fabrics, rubber, steel, stainless steel, aluminum, copper, Teflon®, foil, wood, injection-molded plastic, a woven monofilament material or fiberglass.

22. The drain filter system of claim 12 wherein said support member and said filter basket are both sized to fit within a storm drain of typical dimensions.

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