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(54) **NESTABLE CATCH BASIN ASSEMBLY WITH
REMOVABLE DEBRIS TRAP**

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(57) **ABSTRACT**

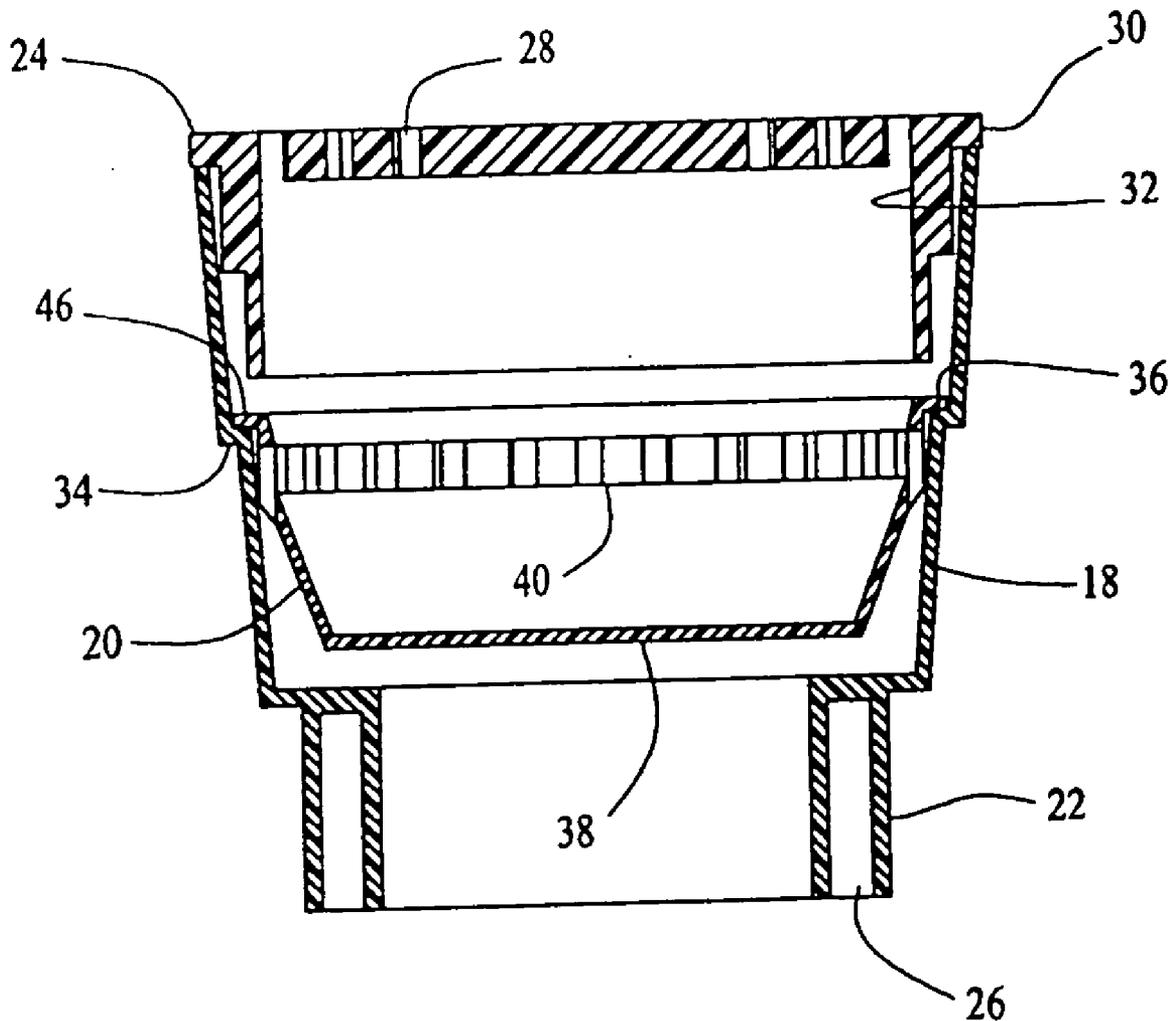
A catch basin assembly for draining water into an underground drainage conduit through a riser includes a housing having an open top and a bottom including an outlet section configured for connection to the riser. A debris trap is removably installed in the housing so as to capture and retain particulate debris from water flowing into the housing through the top thereof, the debris trap having an apertured portion that allows water to flow from the debris trap to the outlet section. The housing has a tapered configuration, whereby two or more housings, with the debris traps removed therefrom, can be stacked in a nesting relationship.

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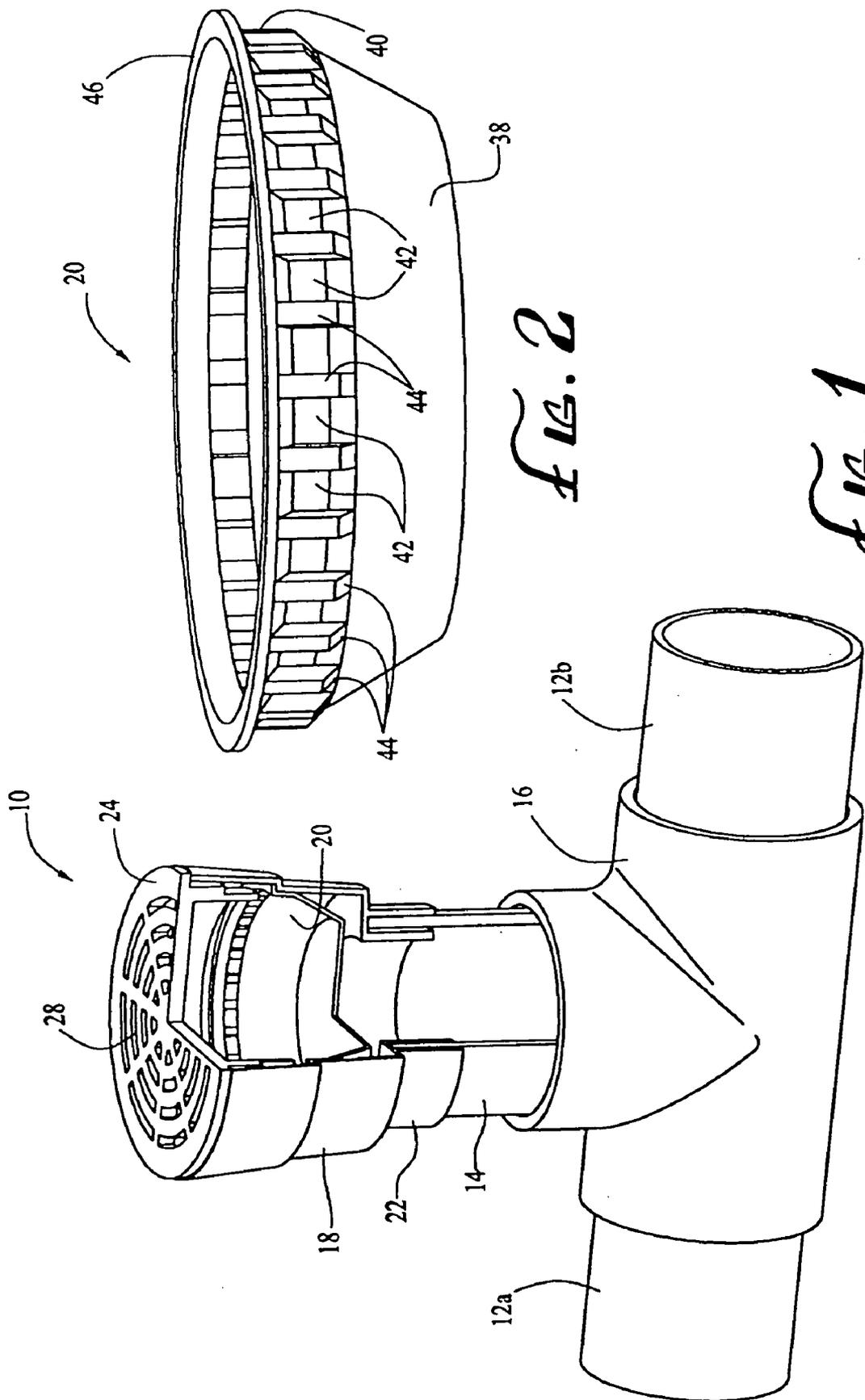


FIG. 2

FIG. 1

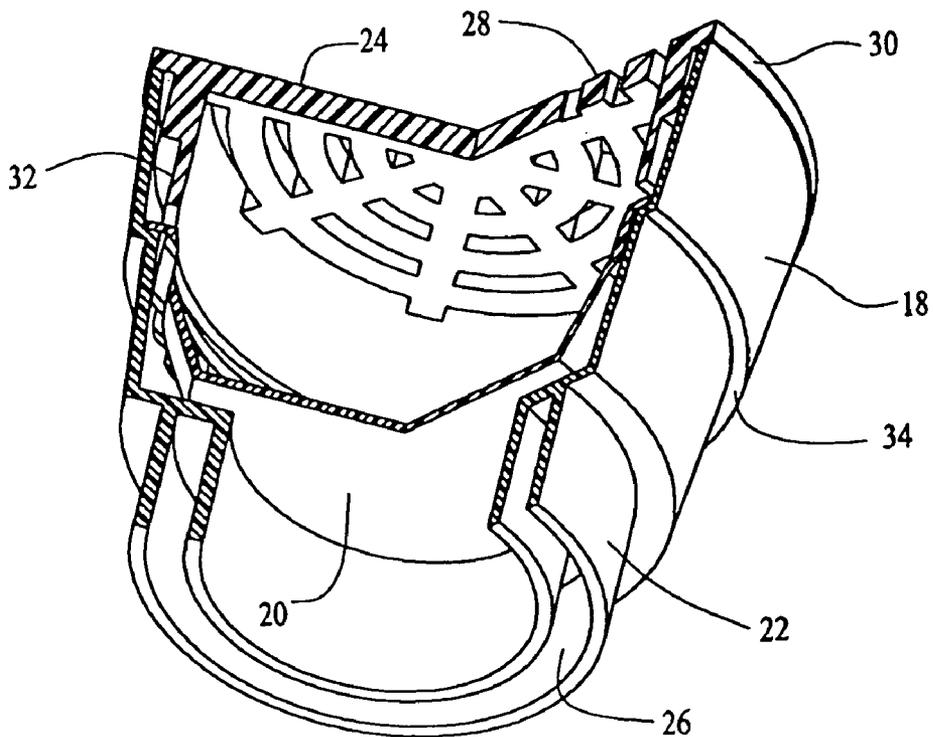


FIG. 3

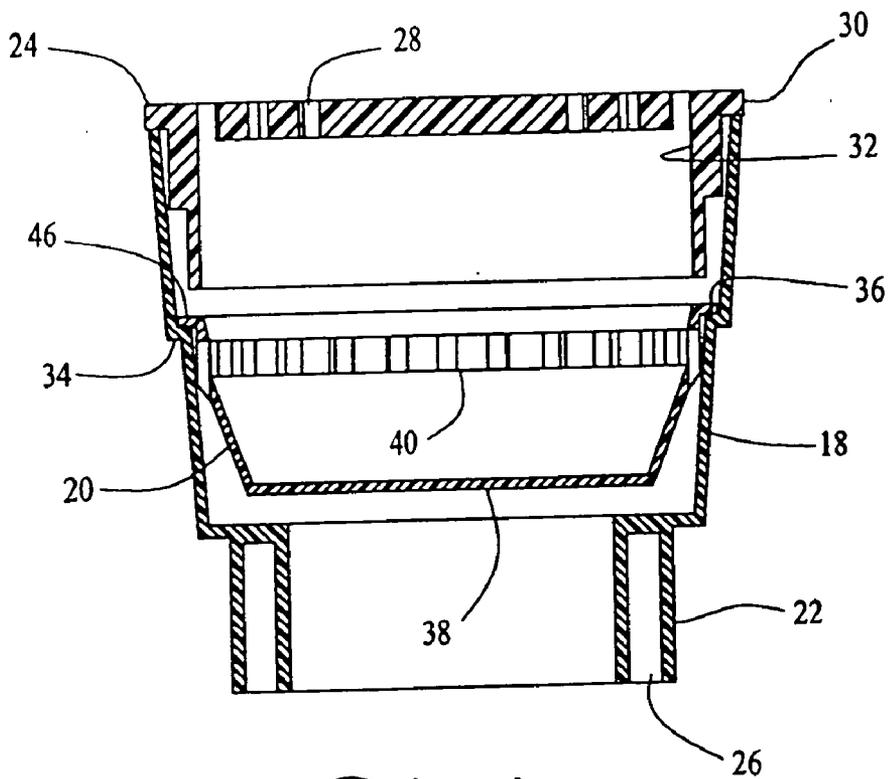


FIG. 4

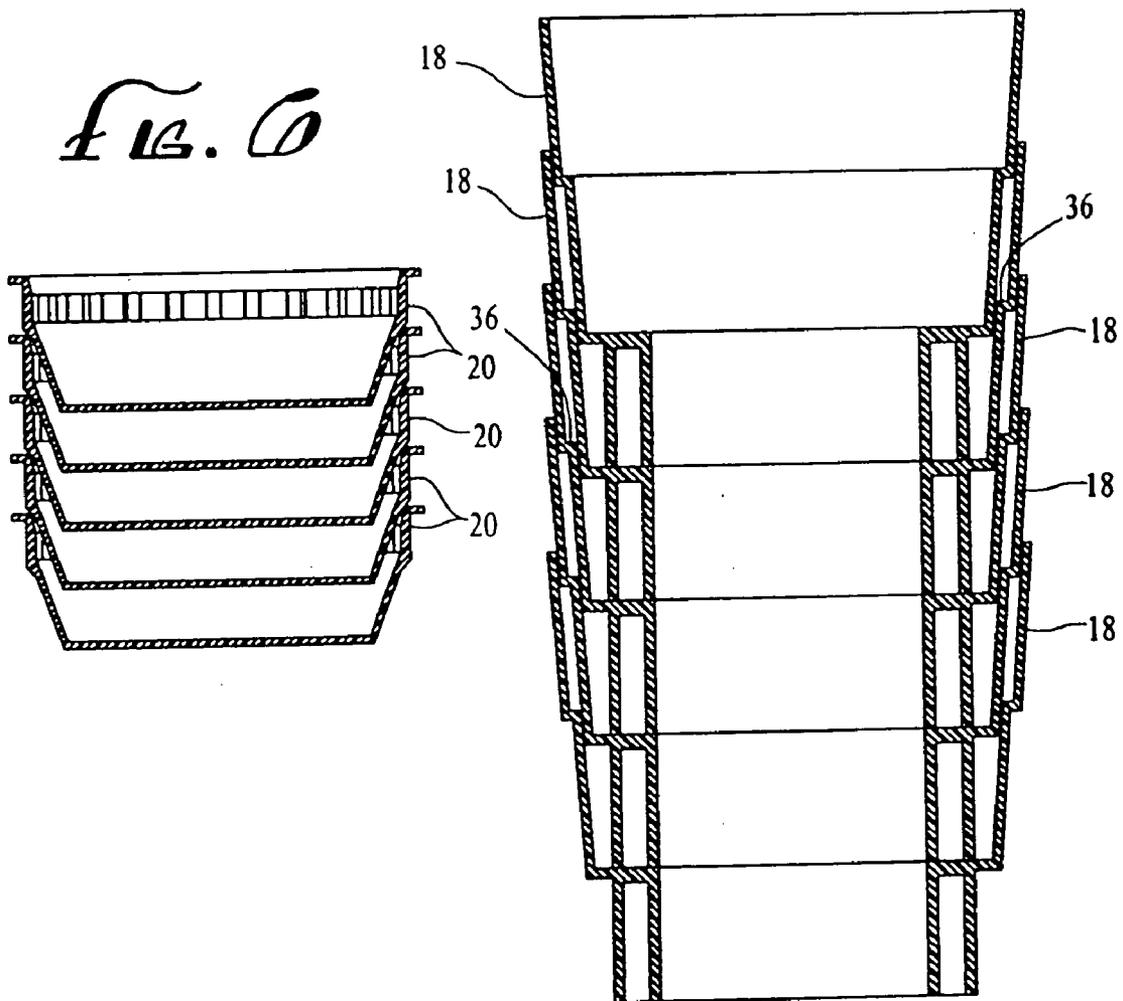


FIG. 5

**NESTABLE CATCH BASIN ASSEMBLY WITH
REMOVABLE DEBRIS TRAP**

**CROSS REFERENCE TO RELATED
APPLICATIONS**

[0001] Not Applicable

**FEDERALLY SPONSORED RESEARCH OR
DEVELOPMENT**

[0002] Not Applicable

BACKGROUND OF THE INVENTION

[0003] This invention relates to catch basins for drainage systems used, for example, to drain rainwater from a field. In particular, it relates to a catch basin assembly, including a basin portion and a removable debris trap, that is configured so that a plurality of the basin portions can be stacked or nested for space-efficient storage and transportation.

[0004] Drainage systems are typically used to drain excess surface water (from rain or watering devices) from an area of land, such as an athletic field or a golf course, or from a landscaped or hardscaped area. Such systems typically include a network of underground conduits or pipes leading to a storm sewer, reservoir, receptacle, or pond ("buried pipe" systems). Surface water or run-off is collected in a plurality of drain assemblies, each of which comprises a catch basin or receptacle that is connected to the underground conduit network by a vertical pipe or riser.

[0005] In prior art drainage systems, a grate covering each catch basin or receptacle prevents some of the larger items of debris carried in the run-off or surface water from entering the drainage system, where such larger items of debris can cause clogs or stoppage. Nevertheless, smaller debris particles, such as sand and silt, can still enter the system and block fluid flow to a degree sufficient to cause water to back up through the drain assemblies.

[0006] Another drawback to prior drainage systems is that, due to variations in the terrain, the depth of the drainage conduits below the surface may vary from place to place within the system. Therefore, the catch basins or receptacles may require housing extensions of various dimensions to connect to the conduit system.

[0007] Finally, in prior art drainage systems, the catch basins or receptacles are not nestable or stackable, thereby taking up much unnecessary space in storage and in transit.

[0008] Accordingly, it would be advantageous to provide a catch basin assembly that can be used with typical buried pipe drainage system, wherein the catch basin assembly has an improved ability to keep particulate debris out of the underground conduits, and wherein the catch basin assembly easily adapts to varying depths of the underground conduits. Moreover, it would be advantageous to make such an assembly with components that are nestable or stackable for ease of storage and transport.

SUMMARY OF THE INVENTION

[0009] Broadly, the present invention is a catch basin assembly for a drainage system having a buried drainage conduit, the catch basin assembly comprising a housing having an open top and an outlet at the bottom adapted for

connection to the buried drainage conduit; and a debris trap removably mounted in housing, wherein the debris trap retains particulate matter entering the housing with water flowing into the top of the housing, while allowing water from which the debris has been removed to flow through to the outlet. More specifically, in a preferred embodiment, the debris trap comprises a bowl for retaining the debris; a retention rim or lip that surrounds the top of the bowl, and that engages an internal shoulder within the housing; and a circumferential array of apertures below the rim, whereby, when the level of water in the bowl reaches the array of apertures, the water flows out of the bowl and through to the outlet. When the bowl of the debris trap is filled with debris (or at predetermined time intervals), the debris trap is simply removed and replaced with a clean unit. A preferred embodiment of the invention also includes a cover with a grate section removably installed in the top of the housing.

[0010] Also, in the preferred embodiment, the outlet is configured for attachment to the upper end (inlet end) of a vertical pipe or riser, the lower (outlet) end of which is fluidly coupled to the buried drainage conduit. Thus, a single housing size can be used throughout a drainage system, with risers of different length allowing the accommodation of different depths of the drainage conduit at different locations. Furthermore, in the preferred embodiment, the housing has a tapered shape, whereby a plurality of housings (with the grates and debris traps removed) can be nestably stacked for space-efficient storage and transport. Likewise, it is advantageous to configure the debris trap for nestable stacking.

[0011] As will be more fully appreciated from the detailed description set forth below, the present invention provides improved capture and retention of particulate debris as compared with prior art devices. Furthermore, the housings and (optionally) the debris traps can be nested for efficient storage and transportation. Finally, the housing can be connected to underground conduits of different depths merely by selecting risers of the appropriate length.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] FIG. 1 is a perspective view, partially in section, of a catch basin assembly, in accordance with a preferred embodiment of the present invention, as connected to a buried drainage conduit by a riser;

[0013] FIG. 2 is a perspective view of the removable debris trap used in the catch basin assembly of FIG. 1;

[0014] FIG. 3 is a bottom perspective view, partially in section, of the catch basin assembly of FIG. 1;

[0015] FIG. 4 is an axial cross-sectional view of the catch basin assembly of FIG. 1;

[0016] FIG. 5 is an axial cross-sectional view of a plurality of catch basin housings, of the type used in the catch basin assembly of FIG. 1, wherein the housings are stacked in a nested stack; and

[0017] FIG. 6 is an axial cross-sectional view of a plurality of debris traps, of the type used in the catch basin assembly of FIG. 1, wherein the debris traps are stacked in a nested stack.

**DETAILED DESCRIPTION OF THE
INVENTION**

[0018] Turning first to FIGS. 1 through 4, a catch basin assembly 10, in accordance with a preferred embodiment of

the present invention, is shown connected to a pair of conduits **12a**, **12b** by a vertical pipe or riser **14** and an inverted “T” fitting **16**. The conduits **12a**, **12b** are of the type typically employed in a buried pipe drainage system. They are fluidly coupled to each other and to the riser **14** by the “T” fitting **16** by any conventional means well-known in the art. For example, the upstream conduit **12a** is inserted into one horizontal leg of the “T” fitting **16**, the downstream conduit **12b** is inserted into the other horizontal leg of the “T” fitting, and the riser **14** is inserted into the upright (vertical) leg of the “T” fitting. The conduits **12a**, **12** and the riser **14** may be secured to the “T” fitting **16** by any suitable means. For example, if these components are made of PVC tubing, they may be secured by any suitable adhesive.

[0019] The catch basin assembly itself comprises a receptacle or housing **18**, a debris trap **20**, an outlet portion **22**, and a grated cover **24**. The housing **18** may be of any suitable shape that can be configured to be stacked in a nesting relationship (as will be described below). In the exemplary embodiment shown, the housing **18** is in the form of a pair of inverted, truncated, right frusticones conjoined end-end-to-end (i.e., axially). Thus, the housing **18** has a circular cross section and an outside diameter that decreases in the axially downward direction so that the housing **18** tapers radially inward from top to bottom. The quality of nestability can be obtained with a housing having a rectangular (particularly, a square) cross section, wherein the perimeter decreases from the top of the housing to its bottom to provide the inward taper. Other housing configurations may also be suitable for this purpose.

[0020] The outlet portion **22** is formed integrally with, and extends downwardly from, the bottom of the housing **18**. The outlet portion **22** is tubular, and it has a bifurcated wall that defines an annular slot **26** (see FIGS. 3 and 4) that is dimensioned to receive the upper end of the riser **14** for connecting the housing **18** to the riser **14** in a fluidly-coupled relationship, as shown in FIG. 1.

[0021] The upper end of the housing **18** defines a large inlet opening in which the cover **24** is advantageously installed. The cover **24** typically includes an apertured grate **28**, a first annular lip **30** surrounding the grate **28**, and a tubular portion **32** depending downward from the grate **28**. The diameter of the lip **30** is approximately equal to the diameter of the open upper end of the housing **18**, so that the lip **30** seats on the open upper end of the housing **18**, as shown in FIGS. 1, 3, and 4. The tubular portion **32** fits inside the top of the housing **18** with a friction fit, and is unsecured, so that it is removable. In the exemplary embodiment shown, the cover **24** is substantially circular in cross section to conform to the circular cross section of the housing **18**. If the housing were to be square, for example, the cover would likewise be square.

[0022] As mentioned above, in the exemplary embodiment shown, the housing **18** is formed of two axially-conjoined, inverted, truncated right frusticones. In this configuration, the exterior of the housing **18** includes a radially inward-directed annular step **34** around its perimeter, approximately at its mid-section. The annular step **34** corresponds to an annular shoulder **36** around the interior wall of the housing **18**. The shoulder **36** supports the debris trap **20**, as explained below.

[0023] The debris trap **20**, as best shown in FIG. 2, comprises a bowl or pan **38** having an exterior surface that

tapers radially inward in the axially downward direction. Integral with the top of the bowl **38** is an annular flow-through section **40** defining a circumferential array of apertures **42** separated by ribs **44**. The flow-through section **40** is topped by a second annular lip **46**, the diameter of which is approximately equal to the diameter of the annular shoulder **36** in the housing **18**, so that when the debris trap **20** is installed in the housing **18**, the second annular lip **46** seats on the shoulder **36**. Thus, when the cover **24** is removed, the debris trap **20** can be removably installed in the housing **18**, and then removed when full of debris, or whenever it is desirable to do so.

[0024] Referring again to FIG. 1, with the catch basin assembly **10** connected to the conduits **12a**, **12b** of the drainage system by means of the riser **14**, water enters housing **18** through the grate **28** in the cover **24**. The grate **28** blocks the entry of larger objects. The water then flows down into the bowl **38** of the debris trap **20**, which captures and retains smaller debris particles, such as sand and silt, which settle out into the bowl **38**. When the water in the debris trap **20** reaches the level of the flow-through section **40**, it flows out of the apertures **42** down into the bottom portion of the housing **18** and through the outlet portion **22** into the riser **14**, and then into “T” fitting **16**, from which it enters the buried conduits **12a** and/or **12b**. Whenever it is desired to remove the debris trap **20**, the cover **24** is removed, and the trap **20** is lifted out. The trap **20** can then be emptied of debris and replaced, or a new trap **20** can be installed.

[0025] FIG. 5 shows how the external configuration of the housing, as described above, allows a plurality of housings **18** to be stacked in a nesting relationship to save space during storage and transit. Likewise, FIG. 6 illustrates a plurality of debris traps **20** stacked in a nesting relationship, as allowed by the external configuration described above.

[0026] While a preferred embodiment of the invention has been described above and is illustrated in the accompanying drawings, it will be appreciated that this embodiment is exemplary only. Thus, a number of variations and modifications may suggest themselves to those skilled in the pertinent arts. For example, the housing and the debris trap may be any convenient shape other than circular in cross section, and the debris trap may be removably retained or held in the housing by any suitable mechanism. Moreover, the debris trap **20** described and shown in the accompanying drawings is merely one example of various functionally equivalent debris trapping means that would suggest themselves to those skilled in the pertinent arts. These and other modifications and variations are considered to be within the spirit and scope of the invention, as defined by the claims that follow.

What is claimed is:

1. A catch basin assembly for draining water into an underground drainage conduit through a riser, the catch basin assembly comprising:

- a housing having an open top and a bottom including an outlet section configured for connection to the riser; and
- a debris trap removably installed in the housing so as to capture and retain particulate debris from water flowing into the housing through the top thereof, the debris trap

having an apertured portion that allows water to flow from the debris trap to the outlet section.

2. The catch basin assembly of claim 1, wherein the housing has a tapered configuration, whereby two or more housings, with the debris traps removed therefrom, can be stacked in a nesting relationship.

3. The catch basin of claim 1, further comprising a cover with a grate section removably installed in the top of the housing.

4. The catch basin of claim 1, wherein the debris trap comprises a bowl portion for collecting the debris, the bowl portion having an upper peripheral rim; and wherein the apertured portion comprises a circumferential array of apertures below the rim.

5. A catch basin assembly for draining water into an underground drainage conduit through a riser, the catch basin assembly comprising:

a housing having an open top and a bottom including an outlet section configured for connection to the riser; and

debris trapping means, removably installed in the housing, for capturing and retaining particulate debris from water flowing into the housing through the top thereof, while allowing water to flow from the debris trapping means to the outlet section.

6. The catch basin assembly of claim 5, wherein the debris trapping means comprises a debris retention portion, a water passage section surrounding the debris retention portion, and means for removably holding the debris trapping means in the housing.

7. The catch basin assembly of claim 6, wherein the housing includes an annular shoulder between the open top thereof and the outlet section, and wherein the means for removably holding the debris trapping means in the housing includes a peripheral rim surrounding the water passage section, the rim being configured and dimensioned so as to be engageable with the shoulder.

8. The catch basin of claim 6, wherein the debris retention portion comprises a bowl for collecting the debris, and

wherein the water passage portion comprises an apertured portion circumferentially surrounding the bowl.

9. The catch basin assembly of claim 5, wherein the housing has a tapered configuration, whereby two or more housings, with the debris trapping means removed therefrom, can be stacked in a nesting relationship.

10. The catch basin of claim 5, further comprising a cover with a grate section removably installed in the top of the housing.

11. A catch basin assembly for draining water into an underground drainage conduit through a riser, the catch basin assembly comprising:

a housing having an open top and a bottom including an outlet section configured for connection to the riser; and

a debris trap removably installed in the housing so as to capture and retain particulate debris from water flowing into the housing through the top thereof, the debris trap having an apertured portion that allows water to flow from the debris trap to the outlet section;

wherein the housing has a tapered configuration, whereby two or more housings, with the debris traps removed therefrom, can be stacked in a nesting relationship.

12. The catch basin of claim 11, wherein the debris trap comprises a bowl portion for collecting the debris, the bowl portion having an upper peripheral rim; and wherein the apertured portion comprises a circumferential array of apertures below the rim.

13. The catch basin assembly of claim 11, wherein the housing includes an annular shoulder between the open top thereof and the outlet section, and wherein the peripheral rim of the debris trap is configured and dimensioned so as to be engageable with the shoulder.

14. The catch basin assembly of claim 11, further comprising a cover with a grate section removably installed in the top of the housing.

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