

FLOOR DRAIN

FIELD OF THE INVENTION

5 This invention relates to a floor drain.

BACKGROUND OF THE INVENTION

10 Floor drains are often provided in bathrooms and kitchens, particularly in high-rise apartments and hotels. The floor drain has a floor-level inlet and is normally provided at the lowest point in a tiled or slabbed floor, such that any water on the floor will flow into the drain. To avoid sewer gases and unpleasant smells entering the room through the drain a water seal is provided between the drain inlet and the drain outlet which leads to the waste or soil pipe.

15 Floor drains serve a number of purposes. They are convenient if the floor is being mopped or otherwise cleaned with water, as the water can be directed into the drain and does not have to be collected or lifted. Also, in the event of a basin or bath overflowing, or a shower being used without a shower curtain in place, any water reaching the floor of the bathroom will flow through the drain, avoiding the flooding and water damage problems that would otherwise result.

20 Maintenance of the water seal in the floor drain relies upon maintenance of a sufficient water level in the drain body. In the past, this was normally assured by regular mopping out of the associated floor. However, with use of alternative cleaning methods which use little if any water, a regular supply of water to the floor drain is no longer assured. Thus, there is a risk that the water providing the seal in the drain will evaporate

to such an extent that the seal is lost, allowing unpleasant smells, sewer gases or infectious agents to pass through the drain and into the room.

This problem can be avoided by regularly pouring water into the floor drain. However, this relies upon an occupier remembering to recharge the drain at regular intervals. Also, conventional floor drains are not intended to accommodate large flow rates, and the act of pouring a bucket of water directly into a floor drain may produce a siphon effect in the drain outlet, leading to the water seal being drawn through the outlet and the seal lost.

In certain areas, such as Scandinavia, floor drains are utilised to accommodate waste water from baths, and are positioned directly beneath bath outlets. Of course such floor drains are difficult to access for other purposes, and suds and the like will often build-up around the drain inlet.

It is among the objectives of certain embodiments of the present invention to obviate or mitigate some of these difficulties.

SUMMARY OF THE INVENTION

According to the present invention there is provided a method of maintaining a seal in a floor drain comprising: providing a floor drain having a floor-level inlet and a sub floor-level outlet and a water seal between the inlet and the outlet; and providing a supplementary supply of water to the drain to maintain the level of water in the water seal sufficient to maintain a seal between the inlet and the outlet.

According to another aspect of the present invention there is provided a floor drain comprising a body having a primary inlet, a secondary inlet and an outlet, in use the primary inlet being located at floor-level and the secondary inlet and the outlet being

located sub floor-level, the body being configured to allow isolation of the primary inlet from the secondary inlet and the outlet by a water seal.

According to a still further aspect of the present invention there is provided a floor drain comprising a body having a primary inlet and an outlet, in use the primary inlet being located at floor-level and the outlet being located sub floor-level, the body defining an anti-siphon seal chamber configured to allow isolation of the primary inlet from the outlet by a water seal, the seal chamber having a lower portion and an upper portion, the upper portion defining a larger area than the lower portion.

According to a yet further aspect of the present invention there is provided a floor drain comprising a body having a primary inlet, a secondary inlet and an outlet, in use the primary inlet being located at floor level and the secondary inlet and the outlet being located sub floor level, the body defining an anti-siphon seal chamber configured to allow isolation of the primary inlet from the secondary inlet and the outlet by a water seal, the seal chamber having a lower portion and an upper portion, the upper portion defining a larger area than the lower portion.

Where a supplementary supply of water is provided to the drain this will be directed into the drain via the secondary or supplementary inlet. Conveniently, the supplementary inlet is connected to the waste outlet of another fitting, such as a basin, bath or shower, which will normally be provided with its own water seal, upstream of the supplementary inlet. This ensures a more regular flow of water through the drain, and minimises any risk of the water seal drying out. Also, the flow of water between the supplementary inlet and the outlet ensures that the water in the floor drain does not stand undisturbed in the drain for long periods.

As the supplementary inlet is isolated from the primary drain inlet by the water seal the likelihood of suds and the like passing out of the primary inlet is minimised.

Also, the absence of a water seal between the supplementary inlet and the outlet, and indeed the inlet and the soil pipe system, facilitates free flow of fluid between this inlet and the outlet, and free flow of fluid from the associated fitting to the soil pipe system.

5 In embodiments provided with an anti-siphon seal chamber, the provision of the anti-siphon chamber allows the drain to accommodate relatively large flow volumes without the risk of the water seal being compromised by siphonic action.

10 In other embodiments, the supplementary supply of water may come from a source other than the waste water from another plumbing fitting. For example, a condensate drain from an air-conditioner, dehumidifier, or tumble-dryer may provide the supplementary supply. In these cases the supplementary inlet need not necessarily be isolated from the drain inlet by the water seal. Alternatively, the supplementary inlet may be coupled to the normal cold water supply, or to another source of water, for example roof guttering. When coupled to a cold water supply or the like, a valve may be utilised to control the supply of water to the floor drain. The valve may be manually operable or
15 may operate automatically at timed intervals or in response to sensors indicating that the water level in the drain is below a predetermined level.

The floor drain may comprise an inlet tube which extends through the primary inlet into the drain body, the lower end of the tube being below the water level in the water seal. The inlet tube may be removable through the primary inlet, to allow clearing
20 of the drain: as floor drains are typically fitted in tiled, slabbed, or otherwise sealed floors, it is likely that the only access to the drain will be through the inlet.

The inlet tube may co-operate with a movable collar or sleeve which is a sliding sealing fit with the lower end of the tube. This allows the effective length of the tube to be varied, accommodating different spacings between the upper end of the tube, which
25 will typically be at or slightly below floor level, and the portion of the body which

defines the base of the seal volume. Seals may be provided between the inlet tube and the collar. In one embodiment a pair of elastomeric seals are mounted in locating grooves in the outer face of the tube for co-operating with the inner face of the collar. The collar and tube may be adapted to retain the collar on the tube, for example a lip on the collar may be arranged to engage a tube seal. A portion or spacer may be provided on the lower end of the collar to engage the base of the body and ensure the appropriate spacing of the end of the collar from the base.

The inlet tube may include a grill or filter spaced from the upper end of the tube, which grill may be removable for cleaning. The upper end of the tube may include a cover grating.

The inlet tube may be adapted to form a sealing fit with the body. In one embodiment an external seal is provided on the tube for engaging an inner wall of the body. The seal may be provided on a cover grating which attaches to the upper end of the tube.

The inlet tube may be keyed to a portion of the inlet body to prevent relative rotation therebetween.

The body may comprise an adjustable inlet portion for accommodating different floor thicknesses. The body may define a lower flange for engaging the underside of a floor and an upper flange for engaging the floor surface directly surrounding the floor drain primary inlet. The lower flange may be defined by a main body portion and the upper flange by an inlet body portion. The portions may be coupled by a screw thread which allows the spacing between the flanges to be varied. The lower flange may feature a sealing arrangement, such as a gasket, adapted to form a sealing engagement with the underside of the floor.

The lower flange may include one or more drain or weep holes which pass from the upper face of the flange into the drain body. Thus, any water which leaks between the floor and the upper flange, or otherwise finds its way to the upper flange, may drain into the body. The weep holes may communicate with the supplementary inlet and outlet. In certain applications the weep holes may be deemed unnecessary or undesirable, in which case the weep holes may be easily sealed by, for example, a small volume of putty. Alternatively, the floor drain may be formed with the/each weep hole closed, the/each weep hole being open-able if desired.

The primary inlet may be sealable.

Preferably, the primary inlet is sealable to prevent fluid exiting the floor drain through the primary inlet.

Preferably, the primary inlet includes a valve.

Most preferably, the valve is a non-return valve adapted to permit fluid to enter the floor drain through the primary inlet but prevent fluid from exiting the floor drain through the primary inlet. In some embodiments, the non-return valve prevents liquids, gases and infectious agents such as viruses or aerosolised bacteria entering a room from the floor drain.

Preferably, the non-return valve includes a seal element and a seal surface, the seal element adapted to engage, and form a seal with, the seal surface.

Preferably, the seal element is an elastomeric material.

Preferably, the seal element is removable. A removable seal element can be easily cleaned.

The seal element may be a diaphragm, flap, floating ball or the like.

The seal element may be biased towards the seal surface.

Preferably, the seal element is adapted to be displaced from the seal surface by a flow of liquid entering the floor drain through the primary inlet.

The supplementary inlet and outlet may be adapted to receive conventional plumbing fittings, and preferably comprise threaded bosses. Thus, for example, 90° pipe
5 bends may be coupled to the body and aligned to accommodate the most appropriate inlet and outlet piping.

According to a further aspect of the present invention there is provided a floor drain comprising a body having a primary inlet and an outlet, in use the primary inlet
10 being located at floor-level and the outlet being located sub floor-level, the body being configured to allow isolation of the primary inlet from the outlet by a water seal, the floor drain further comprising a non-return valve adapted to co-operate with the primary inlet to permit fluid to enter the floor drain through the primary inlet but prevent fluid from exiting the floor drain through the primary inlet.

Such an arrangement reduces the possibility of the water seal evaporating, and
15 reduces the possibility of the passage of infectious agents such as viruses or aerosolised bacteria entering a room from the floor drain.

The previously recited preferred and alternative features of the earlier aspects may also be applicable to this aspect but are not included here for brevity.

20 BRIEF DESCRIPTION OF THE DRAWINGS

These and other aspects of the present invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Figures 1, 2 and 3 are side, end and plan views of a floor drain in accordance with a first embodiment of the present invention;

Figures 4 and 5 are sectional side views of the floor drain of Figure 1, Figure 4 illustrating the minimum spacing between the inlet flanges, and Figure 5 illustrating the maximum spacing between the flanges.

Figure 6 is an exploded sectional view of the floor drain of Figure 1;

5 Figures 7 and 8 are sectional and plan views of the floor drain body;

Figure 9 is a sectional view of a floor drain in accordance with a second embodiment of the present invention incorporating a non-return valve, the non-return valve shown in a closed configuration;

10 Figure 10 is a sectional view of the floor drain of Figure 9 in which the non-return valve is shown in an open configuration;

Figure 11 is a sectional view of the non-return valve in the open configuration;

Figure 12 is a sectional view of the non-return valve in the closed configuration;

Figure 13 is a plan view of the non-return valve; and

15 Figure 14 is a sectional view of a floor drain in accordance with a third embodiment of the present invention incorporating a non-return valve, the non-return valve shown in a closed configuration.

DETAILED DESCRIPTION OF THE DRAWINGS

20 Reference is first made to Figures 1 through 5 of the drawings, which illustrate a floor drain 10 in accordance with a first embodiment of the present invention. The floor drain 10 comprises a body 12 having a primary inlet 14 for location at or slightly below floor-level in a room or space where the floor drain 10 is to be provided. The primary inlet 14 is provided in the upper face of the drain. The body 12 further comprises a supplementary inlet 16 and an outlet 18, both provided in the sides of the body 12. In

use, the supplementary inlet 16 and the outlet 18 are located below the floor of the room in which the floor drain 10 is provided.

In use, water which finds its way onto the floor may pass into the floor drain 10 through the primary inlet 14 and leave the drain through the outlet 18. The supplementary inlet 16 is connected to a basin outlet (not shown), such that water draining from the basin will flow, via a dedicated basin water sealed waste trap, through appropriate piping into the floor drain body 12, through the body 12, and then through the outlet 18.

In use, the primary inlet 14 is isolated from the supplementary inlets 16 and the outlet 18 by a water seal, the body 12 being configured such that water will normally lie in the body 12, to the level shown by line W (Figure 4), such that sewer gases and unpleasant smells from the waste pipe system will be contained and will not find their way through the primary inlet 14 into the room. Of course the supplementary inlet 16 is directly open to the outlet 18, however smells and sewer gases will be trapped in the piping leading to the inlet 14 by the water seal in the trap provided in conjunction with the basin.

Water flowing into the drain 10 through the primary inlet 14 will have to negotiate a serpentine path and the water seal between the inlet 14 and the outlet 18. In contrast, the water flowing through the supplementary inlet 16 may flow directly through the drain 10 to the outlet 18, and thence to the soil pipe system, without displacing the water seal, which facilitates free and quiet flow between the basin and the soil pipe.

The body 12 accommodates an inlet tube 20 which extends through the primary inlet 14 and into the drain body 12, the lower end of the tube 20 being located below the water level W in the water seal. The upper end of the inlet tube is keyed to the body 12 via key slots 22 which prevent relative rotation, but which allow the inlet tube 20 to be

withdrawn from the body 12 to allow cleaning of the drain. A grating 24 is threaded to the upper end of the tube 20, and forms part of the floor surface. The outer circumference of the grating 24 includes a locating groove 26 for accommodating an elastomeric seal 28 which provides a sliding sealing fit with the body 12.

5 The upper end of the inlet tube 20 is of relatively large diameter, and the tube 20 tapers inwardly to provide an annular volume between the lower end of the tube 20 and the body 12, to form a seal chamber 30. The narrower lower end of the inlet tube 20 also facilitates flow between the supplementary inlet 16 and the outlet 18.

10 The body 12 is provided with an adjustable primary inlet portion 32 to accommodate different floor thicknesses. In particular, the body defines a lower flange 34 for engaging the underside of the floor and an upper flange 36 for engaging the floor surface directly surrounding the floor drain primary inlet 14. The lower flange 34 is defined by part of a main body portion 38 which defines an internal screw thread 40 for engaging a corresponding external screw thread 42 provided on an inlet body portion 44
15 which defines the upper flange 36. Thus, the spacing between the flanges 34, 36 may be varied by relative rotation of the body portions 38, 44: Figure 4 illustrates the minimum (25 mm) spacing between the flanges 34, 36, while Figure 5 illustrates the maximum spacing (60 mm) between the flanges 34, 36. An elastomeric sealing gasket 46 is mounted on the lower flange 34 to provide for sealing engagement with the underside of
20 the floor.

 If any water should leak between the upper flange 36 and the floor, the water will pass down to the upper surface of the lower flange 34. The gasket 46 forms an annular channel 48 which retains any such water, and directs the water through a pair of drain holes 50, which extend into the supplementary inlet 16 and the outlet 18. In applications
25 where the drain holes 50 are not required they may be sealed with putty or the like.

To accommodate the different spacings of the flanges 34, 36, the effective length of the inlet tube 20 is also variable, by virtue of the provision of an adjustable sleeve 52 on the lower end of the tube 20. The sleeve 52 is located externally of the lower end of the tube 20, and a pair of seals 54 located in channels 56 in the tube 20 provide a sliding seal between the tube 20 and the sleeve 52. A small inwardly extending lip 58 on the inner face of the sleeve 52 will engage with the uppermost seal 54, preventing the sleeve 52 coming off the lower end of the tube 20.

A pair of stops 60 is formed on the lower end of the sleeve 52 for engaging the body base 62, and thus ensures an appropriate gap is left between the lower end of the sleeve 52 and the body base 62. Figures 4 and 5 of the drawings illustrate two different relative positions for the tube 20 and sleeve 52.

It will be noted that the main body portion 38 is formed of two-parts, an upper part 38a which forms the inlets and outlets, and a lower cup 38b. This of course requires that the parts 38a, 38b are fixed together, and the parts may be snap-fitted or glued together. This arrangement facilitates use of better quality materials, such as polypropylene, to form the main body portion 38. Also, it will be noted that the lower part 38b of the main body portion 38, which accommodates the water seal and forms the seal chamber, has a smaller volume lower portion 64 and a larger volume upper portion 66. This arrangement minimises the possibility of the water forming the seal in the drain 10 being drawn from the body 12 by siphonic effect, which may occur when a large volume of water passes through the drain 10.

In use, various features of the floor drain 10 described above offer numerous advantages. When fitting the floor drain 10, provision of the variable spacing between the flanges 34, 36 allows the drain to accommodate a variety of floor thicknesses. Furthermore, the provision of the threads 40, 42 allows formation of a seal on the

underside of the floor, and the provision of the weep holes 50 allows any condensation or weeping that takes place to drain away and avoids the need to provide other sophisticated, cumbersome forms of sealing.

Linking the floor drain 10 to another unit, such as a basin, via the supplementary inlet 16, also ensures that there is a more consistent flow of water through the drain 10, thus ensuring that any losses from the water seal through condensation or the like are replaced. The ability of water to flow directly from the basin, through the drain to the soil pipe, without encountering an additional water seal or trap, facilitates free and quiet draining of the basin, and ensures that the basin will drain even if the trap in the floor drain is blocked. The provision of the anti-siphon feature of the floor drain body 12 also ensures that high flow rates of water through and from the floor drain 10 will not result in the water seal being siphoned from the drain.

Cleaning of the floor drain 10 is also facilitated by the provision of the removable inlet tube 20, which is automatically length adjustable to accommodate variations in floor thickness.

Figures 1 to 3 illustrate the floor drain 10 being provided in combination with a pair of 90° bends 70, thus providing the installer with much versatility to accommodate different locations of, for example, feeding basins or soil pipes.

Referring now to Figures 9 and 10, these Figures show sectional views of a floor drain 110 in accordance with a second embodiment of the present invention. The floor drain 110 has many features in common with the floor drain 10 of Figures 1 to 8, and common features of the two embodiments are given the same reference numeral on Figures 9 and 10 with the addition of 100.

The floor drain 110 includes a non-return valve 170 adapted to seal the primary inlet 114. The non-return valve 170 is a one way valve permitting fluid flow through the

primary inlet 114 into the inlet tube 120, but not permitting fluid entering the floor drain 110 through the supplementary inlet 116 from surging up the inlet tube 120 and out of the primary inlet 114.

The non-return valve 170 can be most clearly seen in Figures 11 to 13. The non-return valve 170 comprises a tubular body portion 172, and a seal support 174. As can be seen from Figure 13, a portion of the seal support 174 is cruciform in shape, permitting fluid to flow into the insert tube 120.

The non-return valve 170 also comprises a seal unit 175, the seal unit 175 comprising a rubber disc seal 176 mounted on a circular seal carrier 178. Extending from the seal carrier 178 through an aperture 180 in the seal support is a carrier arm 182. The seal carrier 178, and hence the disc seal 176, are biased to the closed configuration, shown in Figure 12, by a compression spring 184 which acts against the seal support 174 and a knob 188 attached to the carrier arm 182. The spring 184 and the carrier arm 182 reciprocate within a spring cover 194.

In the closed configuration, the disc seal 176 engages, and forms a seal with, a seal seat 186 defined by the seal support 174. Referring to Figure 13, the engagement between the disc seal 176 and the seal seat 174 is represented as a dotted line 196.

Referring to Figures 9 and 10, the non-return valve 170 fits into a recess 190 defined by an inner surface 192 of the inlet tube 120.

A flow of fluid through the primary inlet 114 will apply a downward force to the disc seal 176 and the seal carrier 178 sufficient to overcome the closing force applied by the compression spring 184 opening the non-return valve 170 and permitting the flow to enter the inlet tube 120.

In this embodiment the supplementary inlet weep hole 150a includes a closure 194. The closure 194 is to prevent a surge of water through the supplementary inlet

partially exiting the floor drain 110 through the supplementary inlet weep hole 150a. The outlet weep hole 150b is shown open.

Referring now to Figure 14, a sectional view of a floor drain 210 in accordance with a third embodiment of the present invention. The floor drain 210 is substantially the same as the floor drain 110 of Figures 9 and 10 with the exception that the floor drain 210 does not include a supplementary inlet. The floor drain 210 includes a non-return valve 270 across the primary inlet 214 which operates the same way as the previously described non-return valve 170. The non-return valve 270 will assist in reducing the possibility of the water seal W in the drain 210 evaporating.

Those of skill in the art will recognise that the above-described embodiments are merely exemplary of the present invention, and that various modifications and improvements may be made thereto, without departing from the scope of the present invention. For example, the above-described embodiments feature only a single supplementary inlet, and of course two or more such inlets could be provided if necessary. Alternatively, or in addition, a plurality of waste pipes from other units or fittings, for example a basin and a shower, could lead to a common waste pipe in communication with a single supplementary inlet. Furthermore, although the embodiments show one or both weep holes open, it may be desirable to have both weep holes closed. Additionally, although a circular seal element is described in connection with Figures 9 to 13, the seal element could be any suitable shape.

CLAIMS

1. A method of maintaining a seal in a floor drain comprising: providing a floor drain having a floor-level inlet and a sub floor-level outlet and a water seal between the inlet and the outlet; and providing a supplementary supply of water to the drain to maintain the level of water in the water seal sufficient to maintain a seal between the inlet and the outlet.
2. The method of claim 1, wherein, the supplementary supply of water is directed into the drain via a secondary or supplementary inlet.
3. The method of claim 2, wherein the supplementary inlet is connected to the waste outlet of another fitting.
4. The method of claim 2, wherein the supplementary supply of water comes from a condensate drain, a mains cold water supply, or another source of water
5. A floor drain comprising a body having a primary inlet, a secondary inlet and an outlet, in use the primary inlet being located at floor-level and the secondary inlet and the outlet being located sub floor-level, the body being configured to allow isolation of the primary inlet from the secondary inlet and the outlet by a water seal.

6. A floor drain comprising a body having a primary inlet, a secondary inlet and an outlet, in use the primary inlet being located at floor level and the secondary inlet and the outlet being located sub floor level, the body defining an anti-siphon seal chamber configured to allow isolation of the primary inlet from the secondary inlet and the outlet by a water seal, the seal chamber having a lower portion and an upper portion, the upper portion defining a larger area than the lower portion.

7. The floor drain of any of claims 5 to 6, further comprising an inlet tube which extends through the primary inlet into the drain body, the lower end of the tube being below the water level in the water seal.

8. The floor drain of claim 7, wherein the inlet tube is removable through the primary inlet, to allow clearing of the drain.

9. The floor drain of either of claims 7 or 8, wherein the inlet tube is adapted to cooperate with a movable collar or sleeve which is a sliding sealing fit with the lower end of the tube.

10. The floor drain of claim 9, wherein at least one seal is provided between the inlet tube and the collar.

11. The floor drain of claim 10, wherein a pair of elastomeric seals are mounted in locating grooves in the outer face of the tube for co-operating with the inner face of the collar.

5 12. The floor drain of any of claims 9 to 11, wherein the collar and tube are adapted to retain the collar on the tube.

13. The floor drain of claim 12, wherein the collar is retained on the tube by a lip on the collar arranged to engage a tube seal.

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14. The floor drain of any of claims 9 to 13, wherein a portion or spacer is provided on the lower end of the collar to engage the base of the body and ensure the appropriate spacing of the end of the collar from the base.

15 15. The floor drain of any of claims 7 to 14, wherein the inlet tube includes a grill or filter spaced from the upper end of the tube.

16. The floor drain of claim 15, wherein the grill is removable for cleaning.

20 17. The floor drain of any of claims 7 to 16, wherein the upper end of the tube includes a cover grating.

18. The floor drain of any of claims 7 to 17, wherein the inlet tube is adapted to form a sealing fit with the body.

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19. The floor drain of claim 18, wherein an external seal is provided on the tube for engaging an inner wall of the body.

20. The floor drain of claim 18, wherein the seal is provided on a cover grating which
5 attaches to the upper end of the tube.

21. The floor drain of any of claims 7 to 20, wherein the inlet tube is keyed to a portion of the inlet body to prevent relative rotation therebetween.

10 22. The floor drain of any of claims 5 to 21, wherein the body comprises an adjustable inlet portion for accommodating different floor thicknesses.

23. The floor drain of any of claims 5 to 22, wherein the body defines a lower flange for engaging the underside of a floor and an upper flange for engaging the floor surface
15 directly surrounding the floor drain primary inlet.

24. The floor drain of claim 23, wherein the lower flange is defined by a main body portion and the upper flange by an inlet body portion.

20 25. The floor drain of claim 24, wherein the portions are coupled by a screw thread which allows the spacing between the flanges to be varied.

26. The floor drain of any of claims 23 to 25, wherein the lower flange features a sealing arrangement adapted to form a sealing engagement with the underside of the
25 floor.

27. The floor drain of any of claims 23 to 26, wherein the lower flange includes one or more drain or weep holes which pass from the upper face of the flange into the drain body.

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28. The floor drain of claim 27, wherein the weep holes communicate with the supplementary inlet and outlet.

29. The floor drain of any of claims 5 to 28, wherein the primary inlet is sealable.

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30. The floor drain of claim 29, wherein the primary inlet is sealable to prevent fluid exiting the floor drain through the primary inlet.

31. The floor drain of any of claims 5 to 30, wherein the primary inlet includes a valve.

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32. The floor drain of claim 31, wherein the valve is a non-return valve adapted to permit fluid to enter the floor drain through the primary inlet but prevent fluid from exiting the floor drain through the primary inlet.

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33. The floor drain of claim 32, wherein the non-return valve prevents liquids, gases and infectious agents entering a room from the floor drain.

34. The floor drain of either of claims 32 or 33, wherein the non-return valve includes a seal element and a seal surface, the seal element adapted to engage, and form a seal with, the seal surface.

5 35. The floor drain of claim 34, wherein the seal element is an elastomeric material.

36. The floor drain of either of claims 34 or 35, wherein the seal element is removable.

10 37. The floor drain of any of claims 34 to 36, wherein the seal element is a diaphragm, flap, floating ball or the like.

38. The floor drain of any of claims 34 to 37, wherein the seal element is biased towards the seal surface.

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39. The floor drain of any of claims 34 to 38, wherein the seal element is adapted to be displaced from the seal surface by a flow of liquid entering the floor drain through the primary inlet.

20 40. The floor drain of any preceding claim, wherein the supplementary inlet and outlet are adapted to receive conventional plumbing fittings.

41. The floor drain of any preceding claim, wherein the supplementary inlet and outlet comprise threaded bosses.

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