Abstract Title: Adjustable floor drain

A drain for a shower room comprises an upper portion for receiving water and a lower discharge portion. An adjustment mechanism 2 is provided between the upper and lower portions to enable the height of the upper portion to be altered relative to the lower portion. The adjustment means comprises a ramp 12 and cooperating ramp follower. The drain may also provide a removable drain cover 3, sump 1 and outlet.
**Floor Drain**

This invention concerns floor drains in particular for use in shower rooms of the “wet-floor” type.

“Wet-floor” type showers have become increasingly popular, particularly as access for the disabled has become an important consideration in building construction. This type of shower enables a shower chair or wheelchair to be placed beneath the shower head without being especially concerned with water splashing or spraying around the shower room. By providing the shower room with a water resistant floor covering and a suitable fall to a drain, water on the shower room floor will drain away.

Problems do, however, arise with such showers, and particularly with drainage traps for use with them. One such problem results from the need to form a water-tight seal between the water impermeable floor covering of the “wet-floor” and the drain itself so that water from the floor only drains through the trap.

According to the present invention there is provided a floor drain for a shower room, the drain comprising an upper portion
through which water enters the drain, and a lower portion from which water from the upper portion leaves the drain, the drain including adjustment means for adjusting the height of the upper portion relative to the lower portion by rotating elements of the adjustment means relative to each other.

Floor drains in accordance with the present invention can be adjusted easily to accommodate different thicknesses of flooring materials, especially different thicknesses of flooring materials, for example floor tiles.

The adjustment means of floor drains according to the present invention preferably comprises a ramp and a ramp follower, the ramp and ramp follower co-operating to provide said adjustment. The ramp follower preferably comprises a second ramp.

The ramps and ramp followers can be integral with the upper portion of the drain or with the lower portion of the drain.

The adjustment means preferably includes a plurality of ramps co-operating with a plurality of ramp followers.

The upper portions of floor drains according to the present invention preferably include a removable drain cover.

The lower portions of floor drains according to the invention preferably include a sump for receiving water entering the drain.

The lower portions of floor drains according to the invention preferably includes an outlet for water from the drain. However, the lower portions can be supplied without an outlet, this enabling an outlet to be introduced where required.

An embodiment of shower waste in accordance with the invention will now be described with reference to the accompanying drawings in which:-
Fig. 1 is a plan view of the embodiment;

Fig. 2 is an exploded side view of the embodiment;

Fig. 3 is an exploded perspective view of the embodiment with parts omitted; and

Fig. 4 is an exploded perspective view of the embodiment with different parts omitted.

The illustrated waste trap consists of a sump 1, a height adjuster ring 2 and a drain cover 3.

The sump 1 has an outer horizontal ring 4 with through holes 5 for securing the trap to the floor of a shower room, and a central well 6 into which water drains. An outlet 7 enables water to be removed from the trap through a hole 8 in the base of the well 6.

Within the well 6 are two concentric vertical walls 9 and 10 which in use receive the height adjuster ring 2, the inner ring 10 being lower than the outer ring 9 for reasons which will subsequently be explained.

The height adjuster ring 2 has a substantially smooth inner surface 11, and a plurality of ramps 12 on its outer surface. Within the gap 13 between the walls 9 and 10 is a similar plurality of ramps which complement with the ramps 12 of the height adjuster ring 2. (The wall 9 is omitted from Fig. 4 to reveal the complementary ramps 12'.) As a result, the height of the upper surface 14 of the ring 2 relative to the sump 1, and therefore the horizontal ring 4, can be adjusted by rotating the ring 2 relative to the sump 1. In the case of the illustrated embodiment, rotation of the ring 2 in a counter clockwise sense will raise the ring 2 relative to the sump 1, and rotation of the ring 2 in a clockwise sense will lower the ring 2 relative to the sump 1.
The drain cover 3 consists of a vertical cylindrical portion 15 and an apertured horizontal plate 16, the latter allowing water to drain through it into the sump 1. An external peripheral groove 17 the cylindrical portion 15 contains an O-ring 18 which forms a seal with the internal surface of an upper portion of the wall 9, the difference in height between the circular walls 9 and 10 allowing a lower part of the cylindrical portion 15 and the O-ring 18 to engage the upper part of the wall 9.

Installation of the illustrated embodiment of waste trap in a shower room can be achieved by first securing the sump 1 to suitable horizontal surface below the final floor height of the shower room, for example using screws through the holes 5 in the ring 4. The shower room floor can then be completed around the waste trap.

The height adjustment ring 2 with the drain cover 3 inserted into it is then inserted into the gap 13 between the walls 9 and 10 so that the horizontal plate 16 is at the desired height. The cover 3 is rotated until the ramps 12 either engage the complementary ramps in the gap 13 or they slide on each other to enable the plate 16 to be lowered to the desired height.

The ring 2 can then be secured to the sump 1, for example using a suitable plastics adhesive.
Claims

1. A floor drain for a shower room, the drain comprising an upper portion through which water enters the drain, and a lower portion from which water from the upper portion leaves the drain, the drain including adjustment means for adjusting the height of the upper portion relative to the lower portion by rotating elements of the adjustment means relative to each other.

2. A floor drain according to claim 1, wherein the adjustment means comprises a ramp and a ramp follower, the ramp and ramp follower co-operating to provide said adjustment.

3. A floor drain according to claim 2, wherein the ramp follower comprises a second ramp.

4. A floor drain according to claim 2 or claim 3, wherein the ramp or the ramp follower is integral with the upper portion of the drain.

5. A floor drain according to claim 2 or claim 3, wherein the ramp or the ramp follower is integral with the lower portion of the drain.

6. A floor drain according to any of claims 2 to 5, wherein the adjustment means comprises a plurality of ramps co-operating with a plurality of ramp followers.

7. A floor drain according to any of the preceding claims, wherein upper portion includes a removable drain cover.

8. A floor drain according to any of the preceding claims, wherein the lower portion includes a sump for receiving water entering the drain.
9. A floor drain according to any of the preceding claims, wherein the lower portion includes an outlet for water from the drain.
**Patents Act 1977: Search Report under Section 17**

**Documents considered to be relevant:**

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<thead>
<tr>
<th>Category</th>
<th>Relevant to claims</th>
<th>Identity of document and passage or figure of particular relevance</th>
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<tbody>
<tr>
<td>X,Y</td>
<td>X: 1, 2, 4, 5, 7 and 9; Y: 3 and 6</td>
<td>GB 1477760 A (Josam Manufacturing Co.) see figure 1</td>
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<td>US 6381775 B1 (Sondrup) see figure 1</td>
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<td>US 4883590 A (Papp) see figures 2 and 8</td>
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<td>EP 0612893 A1 (AB Sjobo Bruk) see all figures</td>
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<td>DE 19908460 A1 (ACO Severin Ahlmann) see figure 1</td>
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**Field of Search:**

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^X^:
E1C
Worldwide search of patent documents classified in the following areas of the IPC

E03F

The following online and other databases have been used in the preparation of this search report

EPDOC, WPI & JAPIO