In embodiments, the longitudinal axes of the nozzles other than the central nozzle lie at an angle of 45° +/- 15° degrees to the longitudinal axis of the nozzle element, in particular at an angle of 45° +/- 5° degrees.

In embodiments, the diameter of the central nozzle is between 60% and 90%, in particular between 70% and 85%, in particular between 75% and 80% of the diameter of the nozzles other than the central nozzle.

It has been found that such a smaller diameter of the central nozzle, with respect to the other nozzles, creates a better quality shape of the spray, in particular a more regular and essentially conical spray. This is in comparison to a larger central nozzle, which disrupts the spray too much.

In embodiments, the number of nozzles other than the central nozzle is two. In embodiments, the number of nozzles other than the central nozzle is three. In embodiments, the number of nozzles other than the central nozzle is four.

In embodiments, an inner diameter of the nozzles other than the central nozzle is between 0.8 and 1.5 millimetres, and a throat of each of the nozzles, along which the nozzle has a constant diameter, has a length that is at least three times this inner diameter, and in particular at least 2.4 or at least three millimetres.

According to a **third aspect**, which can be realised in combination with or independently from the other aspects, a showerhead as follows is provided:

The showerhead comprises two or three or four or five or six atomisers, each atomiser comprising a set of at least two nozzles arranged to create colliding jets of a liquid and thereby create a spray of droplets of the liquid, and a spray shaper for guiding the spray.

The showerhead further comprises a conduit and atomiser unit and a shell unit, wherein

- the conduit and atomiser unit comprises a conduit element and the atomisers, the conduit element being arranged to guide water from a water hose attachment to the atomisers and the atomisers being rigidly attached to and supported by the conduit element;
- the shell unit comprising at least a first shell part arranged to cover at least part of the conduit and atomiser unit and to provide a handhold for holding the conduit and atomiser unit.

In embodiments, the conduit and atomiser unit constitutes a structurally independent, self-supporting and watertight unit that, in particular, can perform the function of guiding water from the water hose attachment to the one or more atomisers without any part of a shell unit being present.

In embodiments, the showerhead comprises a second shell part, wherein the first and second shell part together form the shell unit, and the shell unit encloses and holds the conduit and atomiser unit.

In other words, the shell unit has no water flow related function. It can be freely dimensioned and configured with regard to material – and consequently also colour and finishing - ergonomics, shape etc. Since both the conduit and the one or more atomisers can made relatively small in comparison with traditional shower or spraying heads, while still providing for an agreeable spray shape, showering experience and good rinsing, they impose fewer geometric constraints on the complete showerhead. This in turn leaves greater freedom for the shape and arrangement of the shell unit.

In embodiments, the conduit element is manufactured as a single piece.

This can be done, for example, by moulding with a plastic material.

PATENT CLAIMS

1. A **showerhead**, comprising two or three or four or five or six atomisers, each atomiser
comprising a set of at least two nozzles arranged to create colliding jets of a liquid and thereby create a spray of droplets of the liquid, and a spray shaper for guiding the spray,
the showerhead comprising a conduit and atomiser unit and a shell unit, wherein
   - the conduit and atomiser unit comprises a conduit element and the atomisers, the conduit element being arranged to guide water from a water hose attachment to the atomisers and the atomisers being rigidly attached to and supported by the conduit element;
   - the shell unit comprising at least a first shell part arranged to cover at least part of the conduit and atomiser unit and to provide a handhold for holding the conduit and atomiser unit.

2. The showerhead of claim 1, wherein the conduit and atomiser unit constitutes a structurally independent, self-supporting and watertight unit that, in particular, can perform the function of guiding water from the water hose attachment to the atomisers without any part of a shell unit being present.

3. The showerhead of claim 1 or 2, comprising a second shell part, wherein the first and second shell part together form the shell unit, and the shell unit encloses and holds the conduit and atomiser unit.

4. The showerhead of claim 1 or 2 or 3, wherein the conduit element is manufactured as a single piece.

5. The showerhead of one of claims 1 to 4, wherein the atomisers are removably attached to the conduit element, in particular by screwing.

6. The showerhead of claim 5, wherein the atomisers are removably attached to the conduit element by a snap-fit connection, in particular with the atomiser units being inserted into the conduit element from the front side.

7. The showerhead of one of claims 1 to 4, wherein the atomisers are irremovably attached to the conduit element, in particular by gluing or welding, in particular by ultrasound welding.

8. The showerhead of one of claims 1 to 7, wherein
wherein in each atomiser the **spray shaper** comprises an inner wall defining an inner volume of the spray shaper, the inner volume opening up from a region near the nozzles towards a front surface of the spray shaper, and
wherein a distance between a back surface and the front surface is between six and ten millimetres.

9. The showerhead of one of claims 1 to 8, each of the atomisers comprising a **nozzle element** with the nozzles, and a **spray shaper**, the nozzle element and spray shaper being separate parts, or the nozzle element and spray shaper being integrally shaped parts.

10. The showerhead of claim 9, the **nozzle element** comprising a first surface, the first surface comprising chamfered sections, with nozzle inlets of the nozzles lying in the chamfered sections.

11. The showerhead of claim 10, wherein surfaces of the chamfered sections lie at a right angle to the longitudinal axis of the respective nozzle, and in particular wherein the surfaces of the chamfered sections are essentially planar.

12. The showerhead of one of claims 8 to 11, wherein in each of the atomisers the inner wall near the nozzles has a first, smaller diameter and near the front surface has a second, larger diameter.

13. The showerhead of claim 12, wherein the first diameter is between six and ten millimetres, in particular eight millimetres.

14. The showerhead of claim 13, wherein the second diameter is between ten and twenty-two millimetres, in particular between thirteen and nineteen millimetres, and in particular is sixteen millimetres.

15. The showerhead of one of the preceding claims, each atomiser comprising three or four or more nozzles arranged to create colliding jets of the liquid and thereby create a spray of droplets of the liquid, and a spray shaper for guiding the spray, wherein the jets of the three or four or more nozzles intersect in one point, and wherein the longitudinal axis of a central nozzle of the three or four or more nozzles is coincident with the longitudinal axis of the nozzle element.

16. The showerhead of claim 15, each atomiser comprising three or four nozzles that lie in a plane, the plane comprising the longitudinal axis of the atomiser.

17. The showerhead of claim 15, wherein the longitudinal axes of the nozzles other than the central nozzle lie at an angle of 45° +/- 15° degrees to the longitudinal axis of the nozzle element, in particular at an angle of 45° +/- 5° degrees.

18. The showerhead of claim 15 or 17, wherein the diameter of the central nozzle is between 60% and 90%, in particular between 70% and 85%, in particular between 75% and 80% of the diameter of the nozzles other than the central nozzle.

19. The showerhead of one of claims 15 to 18, wherein number of nozzles other than the central nozzle is two.

20. The showerhead of one of claims 15 to 18, wherein the number of nozzles other than the central nozzle is three.

21. The showerhead of one of claims 15 to 18, wherein the number of nozzles other than the central nozzle is four.

22. The showerhead of one of claims 15 to 21, wherein an inner diameter of the nozzles other than the central nozzle is between 0.8 and 1.5 millimetres, and wherein, a throat of each of the nozzles, along which the nozzle has a constant diameter, has a length that is at least three times this inner diameter, and in particular at least 2.4 or at least three millimetres.

23. A method for operating the showerhead according to one of claims 15 to 22, wherein a speed of the liquid in the jets prior to colliding is between ten and thirty and preferably at least approximately twenty metres/second, and wherein preferably the pressure at which the liquid is dispensed is obtained from a mains water supply.

24. A method for operating the showerhead according to one of claims 15 to 22, wherein a speed of the liquid in the jets prior to colliding is between thirty and fifty and preferably at least approximately forty metres/second, and preferably wherein the pressure at which the liquid is dispensed is generated by a pump elevating the pressure above the pressure of a mains water supply.