Another method to achieve different fluid output forms from a spray head is to have several sets of jets each with a distinct flow output and then have a valve that sends the fluid to each set in turn, for example a gentle output set, a more firm ‘needle or stream_ like set, and a firmer massage setting. While in practice this works, it has the disadvantage of requiring complex valving and flow paths internally, or leading to the spray head. In addition the spray head must be of sufficient size to accommodate all the differing jets or outlets, even though at any one time only 1 or a mix of sets is being used. An example of such a spray head is that shown in patent publication US 5,172,866 which uses a valving lever mounted on the spray head to change the flow from one jet output set, or set of outputs to another.

In addition such a multi-set output spray head has the disadvantage that it can only output discrete variations in flow, ie one flow type per outlet type. Thus it cannot output a continuum of flows, such as for when a user may want a flow that sits partway between a gentle and firm output.

Object

Embodiments of the present invention seek to provide a spray head and/or a showerhead which may overcome or ameliorate problems with such spray heads/showerheads at present, or which may at least provide a useful choice, or which has one set of nozzles, jets or outlets from which the user can easily and continually adjust the spray type or form that is output.

In this specification where reference has been made to patent specifications, other external documents, or other sources of information, this is generally for the purpose of providing a context for discussing the features of the invention. Unless specifically stated otherwise, reference to such external documents is not to be construed as an admission that such documents, or such sources of information, in any jurisdiction, are prior art, or form part of the common genera l knowledge in the art.

BRIEF DESCRIPTION OF THE INVENTION

In a first aspect, the present invention provides a spray head adapted for connection to a supply of fluid, comprising or including,

A body to receive the supply of fluid,

A plurality of conical mixing volumes, in fluid connection with the body and supply of fluid, each conical mixing volume having an outlet, each conical mixing volume including,

Preferably there is a connection ring that at least covers in part the connection of the cassette to the spray head body.

Preferably the spray head can be mounted on the end of a flexible conduit for the supply of fluid.

Preferably the spray head can be mounted on a rigid conduit for the supply of fluid, for example a shower rail, or through-wall or through ceiling conduit, and maybe rigidly fixed or on an angularly adjustable mount. .

In another aspect, the present invention provides a cassette for a spray head, the cassette fluidly connectable to first fluid supply and a second fluid supply from a spray head body, the spray head body adapted to vary the relative flow rates of the first fluid supply and the second fluid supply, comprising or including,

A first fluid volume, located within the cassette, supplied by the first fluid supply, the first fluid volume suppling fluid to a plurality of first inlets, one or more of the plurality of first inlets to each supply one of a plurality of conical mixing volumes at or towards a base thereof,

A second fluid volume, located within the cassette, supplied by the second fluid supply, the second fluid volume suppling fluid to a plurality of second inlets, one or more of the plurality of second inlets to each supply one of the plurality of conical mixing volumes at or towards a base thereof, upstream of the first inlets, the second inlets located upstream of the first inlets,

wherein the variation in the relative flow rates between the first fluid supply, and the second fluid supply, causes a variation in fluid output from a single outlet of the conical mixing volume at a peak thereof, the outlet being external to the cassette.

In yet another aspect, the present invention provides a kit of parts for a spray head, comprising or including,

A spray head including a head and a body, connectable to a supply of fluid, and within the body there is a valve to output and vary the relative flow rates of a first supply of fluid and a second supply of fluid from the body,

A cassette to fluidly connect to the body and first and second supplies of fluid, the cassette, comprising or including,

A first fluid volume, located within the cassette, supplied by the first fluid supply,

the first fluid volume suppling fluid to a plurality of first inlets, one or more of the plurality of first inlets to each supply one of a plurality of conical mixing volumes at or towards a base thereof,

A second fluid volume, located within the cassette, supplied by the second fluid supply, the second fluid volume suppling fluid to a plurality of second inlets, one or more of the plurality of second inlets to each supply one of the plurality of conical mixing volumes at or towards a base thereof, upstream of the first inlets, the second inlets located upstream of the first inlets,

wherein the variation in the relative flow rates between the first fluid supply, and the second fluid supply, causes a variation in fluid output from a single outlet of the conical mixing volume at a peak thereof, the outlet being external to the cassette.

Preferably the valve is a sliding valve, rotary valve, or similar to divide and vary the supply of fluid.

Preferably the kit includes mountings or fixings for the spray head to a flexible or rigid conduit for the supply of fluid.

As used herein the term ‘and/or’ means ‘and’ or ‘or’, or both.

As used herein ‘(s)’ following a noun means the plural and/or singular forms of the noun.

CLAIMS

1. A spray head adapted for connection to a supply of fluid, comprising or including,

a body to receive the supply of fluid,

a plurality of conical mixing volumes, in fluid connection with the body and supply of fluid, each conical mixing volume having an outlet, each conical mixing volume including,

a. at least one first inlet for a flow of fluid into the conical mixing volume at an angle to a conical axis thereof, and

b. at least one second inlet for a flow of fluid into the conical mixing volume substantially parallel to the conical axis,

a valve disposed upstream of the conical mixing volumes, the valve adapted to divide and vary the supply of fluid flow between the at least one first inlet and the at least one second inlet, which in turn varies the output of the fluid from the outlet of the conical mixing volumes.

2. The spray head of claim 1 wherein the valve is a sliding valve, rotary valve, or similar to divide and vary the supply of fluid.

3. The spray head of claim 1 or 2 wherein the at least one first inlet and the at least one second inlet are formed by an open top at a base of the conical mixing volume.

4. The spray head of any one of claims 1 to 3 wherein the at least one second inlet is upstream of the at least one first inlet.

5. The spray head of any one of claims 1 to 4 wherein the outlet is formed by an aperture at a peak of the conical mixing volume.

6. The spray head of any one of claims 1 to 5 wherein the output of the fluid from the outlet can be varied from, and anywhere in between as a continuum, a fine mist to a hard stream, or needles of water.

7. The spray head of any one of claims 1 to 6 wherein there are a plurality of inlet apertures that form the second inlets.

8. The spray head of any one of claims 1 to 7 wherein there is a plurality of the first inlets.

9. The spray head of any one of claims 1 to 8 wherein the plurality of conical mixing volumes is part of a first unitary body, as a conical volume plate.

10. The spray head of any one of claims 1 to 9 wherein each of the conical mixing volumes at least in part defines the at least one first inlet.

11. The spray head of any one of claims 1 to 10 wherein the at least one first inlet is at substantially ninety degrees to the conical axis.

12. The spray head of claim 1 wherein the top plate seals to the conical volume plate.

13. The spray head of claim 9 wherein there is a face plate located downstream and sealed to the conical volume plate.

14. The spray head of claim 13 wherein the face plate has apertures there through for the outlets.

15. The spray head of any one of claims 1 to 14 wherein the sliding valve includes a valve body which slides along a major axis of the body.

16. The spray head of claim 1 wherein the at least first one inlet is at a tangent to the conical axis.

17. A cassette for a spray head, the cassette fluidly connectable to first fluid supply and a second fluid supply from a spray head body, the spray head body adapted to vary the relative flow rates of the first fluid supply and the second fluid supply, comprising or including,

a. a first fluid volume, located within the cassette, supplied by the first fluid supply, the first fluid volume suppling fluid to a plurality of first inlets, one or more of the plurality of first inlets to each supply one of a plurality of conical mixing volumes at or towards a base thereof,

b. a second fluid volume, located within the cassette, supplied by the second fluid supply, the second fluid volume suppling fluid to a plurality of second inlets, one or more of the plurality of second inlets to each supply one of the plurality of conical mixing volumes at or towards a base thereof, upstream of the first inlets, the second inlets

located upstream of the first inlets,

wherein the variation in the relative flow rates between the first fluid supply, and the second fluid supply, causes a variation in fluid output from a single outlet of the conical mixing volume at a peak thereof, the outlet being external to the cassette.

18. The cassette of claim 17 wherein the variation in the relative flow rates is achieved by a sliding valve in the spray head body.

19. A kit of parts for a spray head, comprising or including,

a. a spray head including a head and a body, connectable to a supply of fluid, and within the body there is a sliding valve to output and vary the relative flow rates of a first supply of fluid and a second supply of fluid from the body,

b. a cassette to fluidly connect to the body and first and second supplies of fluid, the cassette, comprising or including,

c. a first fluid volume, located within the cassette, supplied by the first fluid supply, the first fluid volume suppling fluid to a plurality of first inlets, one or more of the plurality of first inlets to each supply one of a plurality of conical mixing volumes at or towards a base thereof,

d. a second fluid volume, located within the cassette, supplied by the second fluid supply, the second fluid volume suppling fluid to a plurality of second inlets, one or more of the plurality of second inlets to each supply one of the plurality of conical mixing volumes at or towards a base thereof, upstream of the first inlets, the second inlets located upstream of the first inlets,

wherein the variation in the relative flow rates between the first fluid supply, and the second fluid supply, causes a variation in fluid output from a single outlet of the conical mixing volume at a peak thereof, the outlet being external to the cassette.