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(54) Baths

(57) A bath 10 is filled via a pipe 22 that is connected to a channel 18. The water flows around the channel 18 and down conduits 24 that are connected to the channel 18. The base 12 of the bath includes a series of perforations or openings 26 through which water in each conduit 24 can exit into the bath. Once the bath has been filled heated moist air is supplied to the channel 18 and the conduits 24.

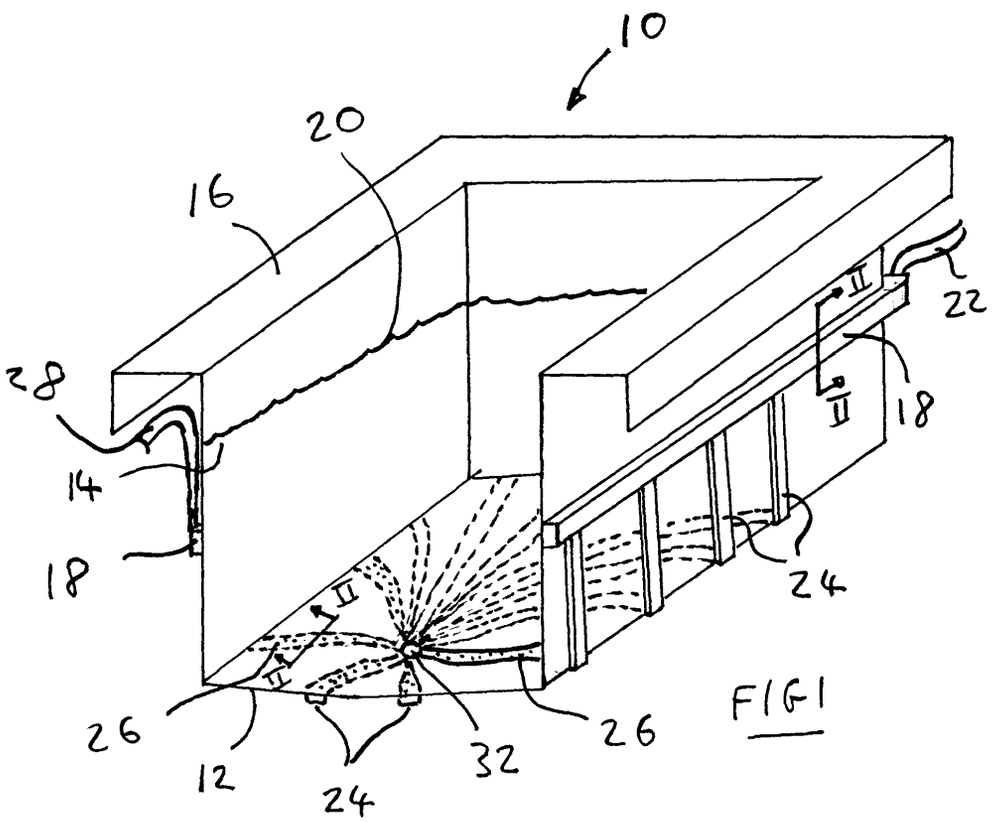

FIG1

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Description

[0001] The present invention relates to a bath incorporating fluid supply means, a method of making a bath incorporating fluid supply means and a method of using a bath incorporating fluid supply means.

[0002] In a known apparatus for supplying air through water in a bath, a platform is mounted to the underside of the base of the bath to provide a chamber between the base of the bath and the platform. Air is supplied to the chamber which then leaves upwardly through the base of the bath. That air is intended to enter the main bath area through perforations extending through the base of the bath.

[0003] As air enters the chamber from beneath, there is a considerable force of air upwardly at a localised region of the platform. That air thus tends to exit the perforations in the base of the bath adjacent to the input at a greater rate than it does at remote perforations. Furthermore, as water may well be present in the chamber air has to pass up through the water before reaching the base of the bath. Thus some areas, where water fills the depth of the chamber, will receive no air to pass out through the perforations and others will receive a surfeit of air. In addition, the air will not be evenly distributed throughout the chamber and water will tend to remain in the chamber.

[0004] It is an object of the present invention to attempt to overcome at least some of the above disadvantages.

[0005] According to one aspect of the present invention in a bath incorporating fluid supply means, the fluid supply means comprises a first fluid supply channel to which is connected, at spaced intervals, a plurality of second fluid channels that extend downwardly from the first fluid channel, the second fluid channels being arranged, in use, to receive fluid from the first channel and to emit fluid into the bath.

[0006] The second fluid channels may be arranged to emit fluid upwardly into the bath.

[0007] The first channel may extend around the bath and may extend substantially completely around the bath and may extend around the outside of the bath. The first channel may extend in the region of or below the overflow of the bath.

[0008] The first channel may be arranged to be supplied with fluid that enters the first channel by being directed in a direction at least partially along the elongate extent of the first channel and may be directed to be substantially coincident with the elongate extent of the first channel.

[0009] The first channel may be inclined with the lowermost portion of the first channel being connected to one of the second fluid channels.

[0010] At least part of at least one air channel may be defined by a wall, the inside of which wall is arranged to hold water in the bath. The wall may have an extent transverse to the elongate direction of the fluid channel over the extent that it defines at least part of the fluid channel and that part of the wall may define the largest transverse extent of the fluid channel. The wall may define at least part of the complete extent of a fluid channel and may define at least part of substantially the complete extent of all fluid channels.

[0011] At least part of at least one fluid channel may be non circular in cross section.

[0012] At least one of the fluid channels may be arranged to follow the contour of the bath over at least part of their coextent. At least one of the fluid channels may be arranged to have, over at least part of its length, a dimension that is greater in the local plane of the wall that retains water in the bath than a dimension extending away from the wall that contains water in the bath at that locality. Those relative dimensions may apply over substantially the complete extent of at least one, some or all of the channels.

[0013] At least part of at least one fluid channel may be comprised by locating a skin against the wall of the bath and sealing that skin at two generally co-extensive elongate extents with the skin between those extents being spaced from the wall of the bath to define the channel.

[0014] The outlet from at least one of the second channels may comprise an opening which may extend through the wall that contains the water into the channel. The opening may be formed by drilling.

[0015] At least one of the second channels may include a plurality of outlets into the bath. The number of openings in that channel, for a given length of channel may decrease as the channel extends away from the first channel. Alternatively or additionally the surface area of the openings may increase as the distance from the first channel of a second channel is increased.

[0016] The ratio of the number of openings for different areas of the bath may be substantially constant.

[0017] The cross sectional area of at least one of the second channels may decrease as the second channel extends away from the first channel.

[0018] The second channels may converge towards each other in a direction away from the first channel and the second channels may converge towards a drain of the bath. The lowermost portion of at least one of the second channels may include an opening into the drain of the bath which opening may be directly into the drain or via a secondary region. A plurality of second channels may include an opening to the secondary region.

[0019] The present invention also includes two fluid supply means as herein referred to. The fluid may comprise air or water or both.

[0020] According to another aspect of the present invention a method of making a bath incorporating fluid supply means comprises connecting a first fluid supply channel to the bath and connecting, at spaced intervals to that first channel, a plurality of second fluid supply channels that extend downwardly away from the first fluid channel whereby the second fluid channels, in use,

are arranged to receive fluid from the first channel to emit fluid into the bath.

[0021] The method may comprise making at least one fluid channel by defining a part of the wall of the fluid channel with the same wall that retains water in the bath.

[0022] The method may comprise the wall that retains water in the bath having the largest transverse extent of the channel.

[0023] The method may comprise forming at least part of one fluid channel to be non-circular in cross section.

[0024] The method may comprise causing the fluid channels to follow the contour of the bath over at least part of their co-extent.

[0025] The method may comprise forming at least one fluid channel such that, over at least part of its length, it has a dimension greater in the local plane of the wall that retains water in the bath than a dimension that extends away from the wall of the bath at that locality.

[0026] The method may comprise forming the wall that retains the water in the bath and then locating a skin against the wall of the bath and sealing that skin at two generally co-extensive elongate extents with the skin, between those extents, being spaced from the wall of the bath to define the channel.

[0027] The method may comprise drilling through the bath to communicate with at least one channel. The method may include drilling less holes for a given length of a second channel at a location further from the first channel than the number of holes that are drilled for a given length nearer to the first channel.

[0028] The method may comprise forming, at the lowermost point of at least one of the second channels, an opening into the drain of the bath.

[0029] The present invention also includes a method of making a bath incorporating two fluid supply means as herein referred to.

[0030] According to a further aspect of the present invention a method of using a bath as herein referred to or when made by a method as herein referred to comprises supplying fluid to the first channel with that fluid then flowing through the second channels into water in the bath.

[0031] The method may comprise clearing water from the first or, alternatively or additionally, the second channels by supplying air to the first channel with that air forcing water out of the second channels into the bath water, for instance back into the bath water. The fluid may leave from a lowermost portion in the second channels which may be in the channels themselves or in a common region to which the channels are connected. The fluid may flow back into the bath at a location above the region where a plug seals with the outlet of the bath.

[0032] The method may comprise supplying water or air, optionally, or water and air simultaneously through different sets of first and second channels.

[0033] The method may comprise draining the water from the bath and supplying air, such as heated air, after draining has been initiated to assist in the drying of the bath.

[0034] The present invention includes any combination of the herein referred to features or limitations.

[0035] The present invention may be carried into practice in various ways but one embodiment will now be described, by way of example, and with reference to the accompanying drawings, in which:-

Figure 1 is a schematic perspective view of an embodiment of the present invention with part of the bath cut away;

Figure 2 is a sectional view taken along any of the lines II-II of Figure 1;

Figure 3 is a schematic cross-section through the drain of the bath; and

Figure 4 is a schematic view similar to Figure 3 of an alternative arrangement in the region of the drain.

[0036] As shown in Figure 1 the bath 10 includes a base 12, side walls 14 and an overhanging rim 16. A channel 18 extends around the bath which may be a continuous channel or which may have sealed ends adjacent to each other. The channel 18 is shown as being beneath the level 20 that water is intended to have in the bath. However, the channel 18 may be at or above that level, if desired. The channel 18 will be inclined slightly with the lowermost portion thereof being coincident with a downwardly extending conduit 24.

[0037] The conduits 24 may extend in a curved direction across the base of the bath. Air flow through the conduits may be of the order of 30 m^3/s.

[0038] The bath may be filled with water through conventional tap (not shown). Alternatively, the bath may be filled via a pipe 22 that is connected to the channel 18. Water from the pipe will flow around the channel and down conduits 24 that are in fluid combination with the channel 18. The conduits 24 extend downwardly over the side walls 14 and then along the underside of the base 12. The base 12 includes a series of perforations or openings 26 that communicate with each conduit 24 in the region of the base 12. The water in the conduits 24 can thus fill the bath through those openings 26. The openings are formed by drilling through the base of the bath.

[0039] Once the bath has been filled to the desired level heated moist air (or heated water) can be supplied to the channel 18 via a supply pipe 28. Although the pipe 28 is shown as supplying the air downwardly into the channel, the pipe 28 could be arranged to supply air in a direction such that it leaves the pipe 28 in the general direction along the channel.

[0040] It will be appreciated that the channel 18 and the conduits 24 may well have water in them. The air

will naturally fill the channel 19 first and then exert a pressure on the water in each of the conduits 24 such that the water is pushed down the conduits 24 by the air with the level in each conduit being generally the same at any one time. Water from the channel 18 and the conduits 24 is forced into the bath through the openings 26.

[0041] Figure 2 shows a cross-section through the channel 18 or the conduits 24. It will be appreciated though that the channel 18 will be of bigger proportions than the conduits 24. In fact, the cross-sectional area of the channel 18 may be twice that of each conduit 24.

[0042] The polycarbonate or acrylic bath 10 has, moulded over its exterior surface, a skin 30 that is spaced from the bath to define the channel or conduit and which is curved inwardly along its longitudinal edges and to be sealed with the wall of the bath in a direction diverging outwardly from the centre line of the channel or conduit. In this way the air entering the bath water is able to gain extra heat through the wall of the bath as it travels along the channel and the conduits. Furthermore, there are no pipes that supply each outlet for air into the bath that can become loose or develop kinks at their point of connection. In addition, the interior surface of the bath remains perfectly smooth, as with a conventional bath and yet many sources of air into the bath water are able to be provided.

[0043] The conduits 24 each converge towards a drain 32 of the bath. In Figure 1 the drain is shown at the middle of the bath. It will be appreciated though that the drain could be located at a side or an end of the bath. The area of the base 12 of the bath that defines the upper portions of the conduits may decrease as the conduits 24 converge on the drain. Thus the cross-sectional area of the conduits may decrease towards the drain. Furthermore, the number of openings in each conduit 24 may decrease as the drain is approached. Alternatively or additionally, the area of at least one of the openings may be greater for an opening nearer the drain than the area of an opening further away from the drain. As the conduits extend downwardly from the drain the overall density of the openings provided by all of the conduits may be generally constant for any given area.

[0044] As shown in Figure 3, each conduit 24 has its lowest point in the region of the drain recess 32 and is provided with an opening 34 into the drain area at the lowest point of the conduit, back into the bath.

[0045] Figure 4 shows an alternative embodiment for the drain area. Each channel 24 leads to a central common recess region 36. That water draining from the channels 24 into the region 36, or being pushed by the air into the recess 36, mingles in the recess before being returned to the bath through openings 34 above the plug 36.

[0046] When blasting air through the conduits the water is able to be substantially completely pushed out of the conduits with the openings 34 being the last to have water being expelled therefrom. When the bath is finished and the plug 36 is removed, water simultaneously leaves from the main bath area and the conduits 24 into the drain 32. Thus a completely self draining (and drying when hot air is left on for a short period during or after draining the water) is provided.

[0047] The present invention has been described in relation to air being discharged through the openings. In an alternative embodiment, water could be supplied through the channel 18 through the openings. The supply of air or water may be controllable by an operator. In a further modification, an additional channel could be provided connected to its own set of conduits 24 such that water could be supplied through the openings associated with one set of conduits and air is supplied through the openings in the other set of conduits.

[0048] The reader's attention is directed to all papers and documents which are filed concurrently with or previous to this specification in connection with this application and which are open to public inspection with this specification, and the contents of all such papers and documents are incorporated herein by reference.

[0049] All of the features disclosed in this specification (including any accompanying claims, abstract and drawings), and/or all of the steps of any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive.

[0050] Each feature disclosed in this specification (including any accompanying claims, abstract and drawings), may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each feature disclosed is one example only of a generic series of equivalent or similar features.

[0051] The invention is not restricted to the details of the foregoing embodiment(s). The invention extends to any novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so disclosed.

Claims

1. A bath (10) incorporating fluid supply means, the fluid supply means comprising a first fluid supply channel (18) which is connected, at spaced intervals, a plurality of second fluid channels (24) that extend downwardly from the first fluid channel, the second fluid channels being arranged, in use, to receive fluid from the first channel and to emit fluid into the bath.

2. A bath as claimed in Claim 1 which is arranged to be supplied with fluid that enters the first channel by being directed in a direction at least partially along the elongate extent of the first channel.

3. A bath as claimed in Claim 1 or 2 in which the first channel is inclined with the lowermost portion of the first channel being connected to one of the second fluid channels.

4. A bath as claimed in any preceding claim in which at least part of at least one fluid channel is defined by a wall, the inside of which wall is arranged to hold water in the bath.

5. A bath as claimed in Claim 4 in which the wall has an extent transverse to the elongate direction of the fluid channel over the extent that it defines at least part of the fluid channel with that transverse extent defining the largest transverse extent of the fluid channel.

6. A bath as claimed in any preceding claim in which at least one of the fluid channels is arranged to have, over at least part of its length, a dimension that is greater in the local plane of the wall that retains water in the bath than a dimension extending away from the wall that contains water in the bath at that locality.

7. A bath as claimed in Claim 6 in which those relative dimensions apply over substantially the complete extent of at least one of the channels.

8. A bath as claimed in any preceding claim in which at least part of at least one fluid channel is comprised by locating a skin against the wall of the bath and sealing that skin at two generally co-extensive elongate extents with the skin between those extents being spaced from the wall of the bath to define the channel.

9. A bath as claimed in any preceding claim in which at least one of the second channels includes a plurality of outlets into the bath with the number of outlets in that channel, for a given length of channel, decreasing as the second channel extends away from the first channel.

10. A bath as claimed in Claim 9 in which the surface area of the outlets increases as the distance from the first channel of a second channel is increased.

11. A bath as claimed in any preceding claim in which the cross-sectional area of at least one of the second channels decreases as the second channel extends away from the first channel.

12. A bath as claimed in any preceding claim in which the second channels converge towards each other in a direction away from the first channel.

13. A bath as claimed in any preceding claim including two fluid supply means.

14. A method of making a bath incorporating fluid supply means comprising connecting a first fluid supply channel to the bath and connecting, at spaced intervals to that first channel, a plurality of second fluid supply channels that extend downwardly away from the first fluid channel whereby the second fluid channels, in use, are arranged to receive fluid from the first channels to emit fluid into the bath.

15. A method as claimed in Claim 14 comprising making at least one fluid channel by defining a part of the wall of the fluid channel with the same wall that retains water in the bath.

16. A method of using a bath as claimed in any of Claims 1 to 13 comprising supplying fluid to the first channel with that fluid then flowing through the second channels into the bath.

17. A method as claimed in Claim 16 comprising clearing water from the first channels by that supply of fluid by supplying air to the first channel with that air forcing water out of the second channels into the bath.

18. A method as claimed in any of Claims 16 or 17 comprising supplying, optionally, water or air to the first channel.

19. A method as claimed in any of Claims 16 to 18 comprising supplying optionally water or air through different sets of first and second channels.

20. A method as claimed in any of Claims 16 to 19 comprising draining water from the bath and supplying air after draining has been initiated to assist in the drying of the bath.

21. A method as claimed in any of Claims 16 to 20 comprising supplying water to the first channel to fill the bath.

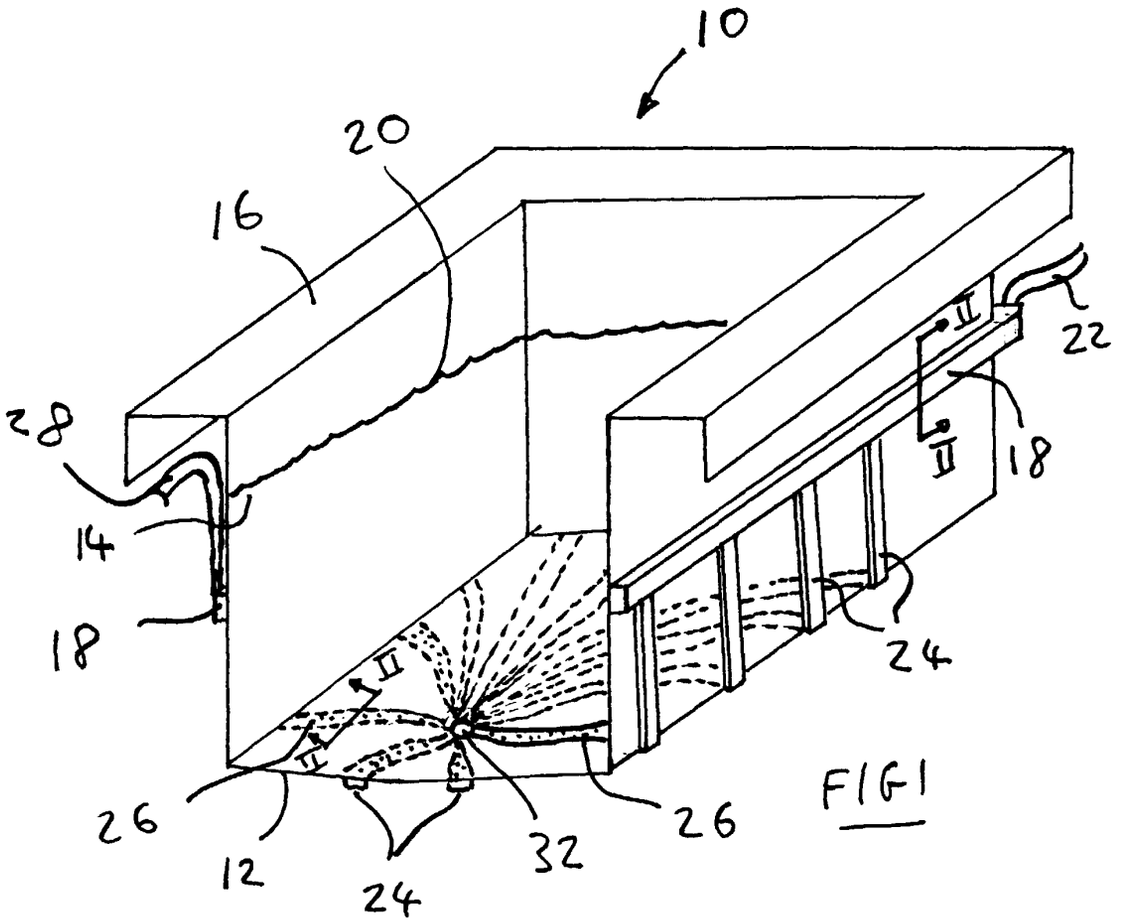

FIG1

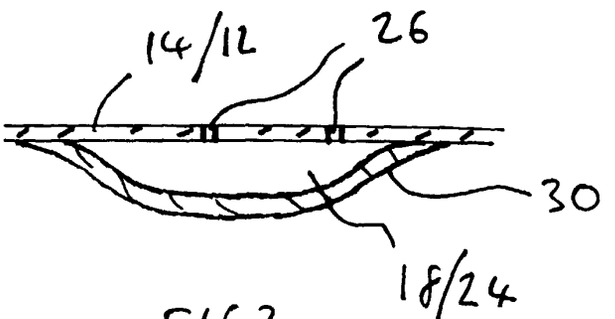

FIG2

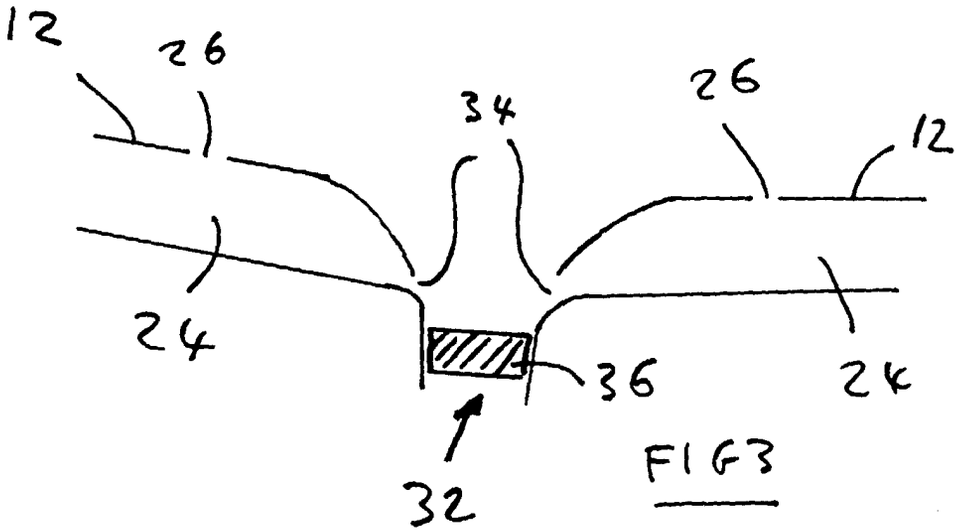

FIG3

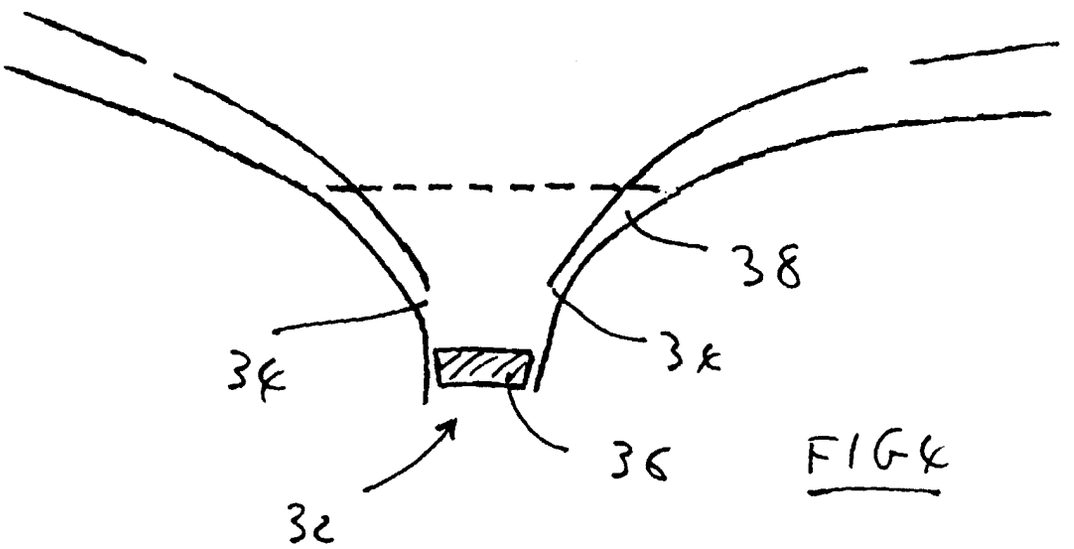

FIG4