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(54) **Shower head**

Brausekopf

Pomme de douche

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Description

[0001] The present application relates to a shower head and, more particularly, to a shower head in which the nozzles may be effectively descaled.

[0002] A large variety of different shower heads are known for use in bathrooms and the like. These shower heads may be arranged in a number of ways, for instance fixed to a wall or provided with a handle and a connecting flexible tube.

[0003] The shower heads are usually provided with a plurality of nozzles which produce respective jets of water to provide an overall spray pattern. Furthermore, some shower heads have two or more sets or arrays of nozzles and some operating means, such as a lever, for allowing a user to select between the sets of nozzles and vary the overall spray pattern. Shower heads may be arranged merely for the selection of the number of sets of nozzles and, hence, the extent of the combined spray pattern. Alternatively, respective sets of nozzles can in some shower heads produce different types of jet stream and/or different types of spray pattern. With these shower heads, the user may select between the types of jet stream or spray pattern.

[0004] To produce fine jets of water, often of high pressure, the nozzles have to be of relatively small cross-sectional area. Unfortunately, this makes them particularly prone to scaling. In particular, limescale is deposited from the water in and around the downstream portion of the nozzle, causing the nozzle to become partly, if not totally, blocked.

[0005] For a traditional type shower head merely having a face plate with a series of holes forming the nozzles, it has been proposed to provide a series of pins within the shower head which can be moved into and through the holes so as to clear the scale. This does not provide any direct means for removing scale from around the nozzle outlets, which, if nothing else, leaves the shower head looking unsightly.

[0006] It has also been proposed to provide a face plate from which elastomeric teats extend, the elastomeric teats forming the nozzles. With this arrangement of shower head, the user can rub the teats with his or her thumb or fingers, thereby deflecting them. The purpose of this deflection is to deform the teats so that the hard inflexible scale breaks up or at least becomes detached from the teats.

[0007] US 5,172,862, upon which the precharacterising portions of appended claim 1 and of claim 16 are based develops this idea further and provides a rotatable disk adjacent the face plate. The rotatable disk has an array of holes corresponding to the elastomeric teats such that, when the rotatable disk is rotated, it contacts the outer portions of the teats and deflects the outer portions in a circumferential direction so as to dislodge scale.

[0008] DE-A- 3044310 considers elastomeric tube elements extending from a pipe body and uses a similar arrangement, with an outer sleeve having openings corresponding to the tube elements, to deflect the tube elements and the resulting shower jets.

[0009] With this kind of shower head, it is necessary for the elastomeric teats to extend beyond the face plate of the shower head in order to allow them to be flexed. This makes the shower head inherently unsightly and also leaves the nozzles themselves vulnerable to damage. This is of particular concern, since the teats are small and have to be made from relatively thin soft material to allow adequate deflection.

[0010] Furthermore, the descaling ability of the shower head is not as good as one might first think. As explained above, the elastomeric teats are cleaned by wiping a member, such as one's finger, over the outermost end surface of the teat. This deflects the teats to one side in a pivoting movement about the position at which they extend from the face plate. Thus, a teat is deflected as a whole without particular deformation at its end, such that scale need not necessarily be cleared from within the rubber teat. In particular, a rubber teat having scale built up in its outlet opening can easily be deflected to one side at its base whilst leaving the scaled end of the teat intact.

[0011] A further disadvantage of the elastomeric teat arrangement is that deflection is caused by rubbing the thinnest most vulnerable part of the rubber teat, often with hard scale particles. This can result in the teats being damaged very quickly.

[0012] In view of the above problems, according to the present invention, there is provided a method of descaling the nozzles of a shower head having nozzles constructed of a flexible resilient material extending continuously from an upstream portion to a downstream portion, the method being characterised by:

providing for at least the downstream portion of each nozzle, a first component conforming to part of the peripheral extent of the outer surface of the nozzle and a second component conforming to substantially the remainder of the peripheral extent of the outer surface of the nozzle, such that the downstream portion of the nozzle is substantially fully supported; and

relatively moving the first and second components such that they engage diametrically opposite sides of the nozzles so as to shear the nozzles.

[0013] According to the present invention there is also a shower head having:

at least a first array of nozzles for issuing respective jets of water to form a spray pattern, each nozzle being constructed of a flexible resilient material and extending continuously from an upstream portion to a downstream portion; characterized in that:

the shower head also has, for at least the down-

stream portion of each nozzle:

a first component conforming to part of the peripheral extent of the outer surface of the nozzle; and

a second component conforming to substantially the remainder of the peripheral extent of the outer surface of the nozzle, such that the downstream portion of the nozzle is substantially fully supported; wherein

the first and second components engage diametrically opposite sides of the nozzles and are relatively movable so as to shear the nozzles.

[0014] In this way, it is ensured that the flexible nozzle is deformed such that scaling will be more effectively broken up or released. Furthermore, since the nozzles are deformed by contact with their sides, rather than their ends, the relatively weak end surface is not rubbed or damaged.

[0015] Since the nozzles are deformed by action on their side surfaces, it is not necessary for them to protrude beyond the face plate, which may itself be formed from the first and second components. As a result, the ends of the nozzles need not protrude beyond the face plate, such that-they do not spoil the appearance of the shower head and are not vulnerable to being damaged.

[0016] A further problem with the previous design of shower head is also overcome, namely that the teats extending beyond the face plate inevitably change in size and shape according to the water pressure, thereby making the resulting spray pattern relatively unstable.

[0017] By supporting the nozzles, they are more stable and deform less with varying pressure. Furthermore, the material properties of the nozzles may be chosen to optimize flexibility and release of scale, since they do not have to be designed to be self supporting.

[0018] The first component can extend along the entire length of the nozzle, preferably surrounding the entire peripheral extent of the outer surface of each nozzle at its upstream portion.

[0019] In this way, the upstream portion of each nozzle is supported, but is not directly deflected by a second component. This is particularly advantageous, since the deflection of the downstream portion of the nozzle by the second component can gently reduce along the length of the upstream portion up to the base of the nozzle, where no deflection occurs.

[0020] Preferably, an upstream end of each nozzle is formed integrally with a flange which is mounted upstream of and against an inner surface of the first component which is substantially perpendicular to the extent of the nozzle.

[0021] The flange may then be used to seal with upstream moving components of the shower head, for instance by means of lip seals. This has the advantage of avoiding the need for any seals around the first and second components.

[0022] Preferably, the upstream portion of each nozzle is substantially cylindrical and the downstream portion of each nozzle is substantially conical.

[0023] The conical section is used, since it allows nozzles to direct water jets at different angles according to the centre line of the cone of the respective nozzle, whilst allowing the molding tools to be withdrawn easily. The conical internal cross-section also helps to provide well formed jets. The upstream cylindrical outer cross-section allows a good transition between the downstream end of the nozzle where the greatest deflection occurs and the upstream portion of the nozzle where substantially only twisting occurs.

[0024] Preferably, the shower head includes a front face plate from which the jets of water issue and a rotatable bezel around the periphery of the face plate, one of the first and second components being connected to the bezel so as to cause shearing of each nozzle when the bezel is rotated.

[0025] The first and second components may be common to all of the nozzles of the first array.

[0026] This is particularly advantageous when the centres of the nozzles are positioned substantially around a common circle, since then the first component may have an inner periphery positioned substantially along the circle and the second component may have an outer periphery positioned substantially along the circle.

[0027] That one of the first and second components which is connected to the bezel may actually be formed integrally with the bezel, but, by being formed separately, variations in appearance are possible, for instance a chromed bezel may be provided together with coloured components forming the face plate.

[0028] Preferably, the shower head is capable of producing more than one spray pattern and further comprises a movable member for changing between spray patterns, one of the first and second components being connected to the movable member so as to cause shearing of each nozzle when changing between spray patterns.

[0029] The movable member may preferably be the bezel mentioned above.

[0030] In this way, whenever a user moves the member or rotates the bezel to change spray patterns, the nozzles are automatically deflected to clean them of any limescale.

[0031] The shower head may include more than one array of nozzles according to the present invention, preferably arranged in two or more concentric circles.

[0032] Preferably, they are arranged such that movement of one component to shear an outer ring of nozzles will shear that outer ring of nozzles and then transmit the motion inwardly to shear also the inner ring of nozzles with respect to a third component.

[0033] Of course, this arrangement can be repeated

with any number of concentric rings of nozzles.

[0034] Preferably, the nozzles of an array are formed from a single integral component, thereby simplify manufacture and construction.

[0035] This approach can be extended to multiple arrays of nozzles.

[0036] The present invention will be more clearly understood from the following description, given by way of example only, with reference to the accompanying drawings in which:

Figure 1 illustrates a partial side cross-section of a first embodiment;
Figure 2 illustrates the face plate of the first embodiment;
Figure 3 illustrates a nozzle according to the present invention;
Figure 4 illustrates part of an arrangement of the first embodiment;
Figure 5 illustrates part of another arrangement of the first embodiment;
Figure 6 illustrates an alternative spring return mechanism for the first embodiment;
Figure 7 illustrates a partial side cross-section of a second embodiment;
Figure 8 illustrates the face plate of the second embodiment;
Figure 9 illustrates two nozzles according to the present invention;
Figure 10 illustrates a combined third and fourth component for use in the second embodiment;
Figure 11 illustrates another combined third and fourth component for use in the second embodiment;
Figure 12 illustrates two nozzles according to the present invention.

[0037] As illustrated in Figures 1 and 2, the shower head 2 is fitted to an extension 4, of which only the end is shown. The extension 4 may be part of a handle or a wall fixture.

[0038] Water is guided up the inside of the extension 4 and into the shower head 2.

[0039] The shower head 2 of Figures 1 and 2 includes three different arrays 6, 8, 10 of nozzles. A mechanism is provided within the shower head 2 to supply selectively the water from the extension 4 into one or more of the arrays 6, 8, 10 of nozzles. The internal structure of this particular shower head 2 is also arranged to provide different types of jets of water from the respective arrays of nozzles, in particular fine powerful jets from array 6, aerated jets from array 8 and normal or pulsating jets from array 10.

[0040] In the embodiment of Figures 1 and 2, a bezel 12 is also provided around the face plate 14 in which the nozzles are formed. By rotating the bezel 12 relative to the rest of the shower head 2, the internal mechanism is operated so as to change between the various spray patterns and provide water selectively to one or more of the arrays 6,8,10.

[0041] The nature of the internal arrangement of the shower head with respect to varying the spray patterns is not of particular relevance to the present invention, since the present invention concerns the scaling of arrays of nozzles.

[0042] In the embodiment of Figures 1 and 2, the outer array 6 of nozzles includes a series of nozzles 16 arranged in accordance with the present invention.

[0043] Figure 3 illustrates a cross-section through one such nozzle 16.

[0044] The nozzle 16 is formed of an elastomeric material and comprises a downstream generally conically shaped portion 16a, an upstream generally cylindrically shaped portion 16b and a flange portion 16c with lip seals 16d. The nozzle 16 is supported by a first component 18 and a second component 20 which together form part of the face plate 14. These are also illustrated in Figures 4 and 5.

[0045] As can be seen particularly in Figure 4, the first component 18 surrounds the upstream portion 16b of the nozzle 16 completely, but only encircles part of the downstream portion 16a. The remainder of the downstream portion 16a is surrounded by the second component 20. Figure 4 also shows that each of the nozzles 16 can be formed with a common flange 16c and that common first and second components 18,20 can be provided for all of the nozzles 16 of the array by providing them as annular members.

[0046] As illustrated in Figure 3, the first component 18 is connected to the bezel 12. In this embodiment, the bezel 12 is provided with extensions 12a which fit into corresponding recesses 18a in the first component 18. This rotationally fixes the bezel 12 to the first component 18, such that the bezel 12 may be used to rotate the first component 18. Of course, the bezel may be attached to the first component 18 in other ways, for instance using adhesive. Indeed, the bezel 12 and first component 18 can be formed as an integral component. However, the advantage of forming them as separate components is that the bezel 12 may then be formed of a different material to that of the first component 18.

[0047] As has been mentioned above and as can be seen in Figure 1, the bezel 12 is rotatable relative to the rest of the handset 2.

[0048] During use of the shower head, the bezel 12 can be rotated relative to the handset 2 in order to change the spray pattern in use. However, since the bezel 12 is rotationally fixed to the first component 18, rotation of the bezel 12 will also cause rotation of the first component 18 and all of the nozzles 16 which it supports.

[0049] The second component 20 is free to rotate relative to the first component 18. Therefore, when the bezel 12 and first component 18 are rotated, a relative rotation occurs between the first component 18 and second component 20. In particular, those parts of the first

component 18 and the second component 20 which support the downstream portion 16a of the nozzle 16 move relative to one another and shear the downstream portion 16a of the nozzle 16 causing the scale in the downstream portion 16a to be dislodged from the nozzle 16. Furthermore, since the nozzle 16 is only fixed where it joins the flange portion 16c, the length of the upstream portion 16b gradually absorbs the shearing of the downstream portion 16a as a gradually decreasing twist along its length.

[0050] As mentioned above, the flange 16c of the nozzle 16 is provided with two peripheral lip seals 16d. As illustrated in Figure 3, these are used to seal against internal side walls of the shower head 2. In this way, water which is ducted to the nozzles 16 need not at any stage come into contact with the relatively complex arrangement of first and second components 18,20 and bezel 12. In particular, the moving arrangement of the first and second components 18,20 is provided outside of the channelling of the water, such that it is not necessary to provide any water seals in the moving parts.

[0051] As discussed above, the downstream portion 16a of the nozzle 16 are conical in shape. Preferably, the divide between the first and second components 16,18 lies substantially along the central axis of this cone. However, in practice, consecutive downstream portions 16a will have internal conical sections with axes at different angles. By way of example, three different angles θ, for instance -4°, 0°, 4° or 0°, 4°, 8° etc, may be used in sequence around the array of nozzles 16, such that a spread of water jets is formed. The internal cross-section may be entirely conical as shown in Figure 3 or only partly conical as shown subsequently in Figures 9 and 12.

[0052] Despite the variation of internal sections, it is proposed that the outer sections of the downstream portion 16a of the nozzle 16 should all be the same, such that all of the supporting areas of the first and second components 18,20 can be of the same shape and dimension and not require the nozzles 16 to be inserted with a particular orientation.

[0053] It may be that a shower head is merely provided with an array of nozzles 16 as discussed above without any further array of nozzles. In this case, the bezel 12 would be used only for cleaning the nozzle 16. However, for the embodiment illustrated in Figures 1 and 2, two further arrays, 8 and 10 are provided and the bezel 12 also functions to operate the mechanism within the shower head 2 to redirect water between the various arrays 6,8,10.

[0054] For either of these arrangements, it may be undesirable for the first component 18 to have complete freedom of movement against the second component 20, since a user could over-rotate the first component 18 relative to the second component 20 and thereby damage the nozzle 16. This may be a problem, particularly where the bezel 12 is also used to operate a fairly stiff internal mechanism and where this operation is transmitted through the first and second components 18,20.

[0055] In order to deal with this problem, the first and second components 18,20 should be provided with some kind of interlocking arrangement. In particular, the first and second components 18,20 should be arranged such that only a limited amount of relative rotation is possible. In particular, once the first component 18 has rotated relative to the second component 20 sufficient to provide the required shear and deformation of the nozzle 16, then it should engage with the second component 20 so as to rotate the second component 20 directly without any further relative rotation.

[0056] Figure 5 illustrates a possible embodiment.

[0057] An outer surface of the second component 20 is formed with a series of outwardly facing teeth 22. An inner surface of the first component 18 is formed with a corresponding series of inwardly facing indents 24. The indents 24 are slightly bigger than the teeth 22 such that, with the teeth 22 of the second component 20 in the indents 24 of the first component 18, a small amount of relative rotation is possible between the first component 18 and second component 20. The relative sizes of the teeth 22 and indents 24 are determined according to the size of the nozzle 16 and the radius of the circle along which they are positioned.

[0058] Preferably, during shearing, a nozzle 16 is to be sheared such that the side wall of one half of the nozzle 16 is sheared to a position adjacent the centre of the other half of the nozzle 16. Therefore, the relative sizes of the teeth 22 and indents 24 should be chosen such that a side surface of a tooth 22 engages a corresponding side surface of an indent 24 when the nozzles 16 have been sheared to the extent mentioned above. In this way, any further shearing of the nozzles is prevented and further transmission of forces between the first component 18 and the second component 22 occurs between the side surfaces of the teeth 22 and indents 24, rather than through the nozzles 16.

[0059] It would be possible to arrange the spacings and sizes of the teeth 22 and indents 24 such that shearing of the nozzles 16 is only possible in one direction. However, in the preferred embodiment, the teeth 22 and indents 24 allow relative rotation and shearing in both directions.

[0060] Clearly, it is preferable that when the shearing mechanism is released, the nozzles 16 return to their unsheared and undeformed state. In this regard, it is possible to rely merely on the elasticity of the nozzles 16 to return the first and second components 18,20 to their aligned position. However, it is preferred that an additional sprung mechanism is provided to return the first and second components 18,20 to their aligned state when no relative rotation is imposed by the user. In other words, in its "at rest" state, where a user is not rotating the bezel 12 or first component 18, the first component 18 is forced to a position where its supporting surfaces are aligned with the supporting surfaces of the second

component 20 and the nozzles 16 are not deformed.

[0061] Figure 5 illustrates an embodiment including this preferred feature.

[0062] Although special parts could be provided, this embodiment makes use of the teeth 22. The inner surface of the first component 18 is formed with a resilient cantilevered arm 26 having a return indent 28. Unlike the normal indents 24, the return indent 28 is of substantially the same shape and size as the teeth 22. Furthermore the return indent 28 is positioned in the first component 18 such that, in its at rest state when it fully engages a tooth 22, the supporting surfaces of the first component 18 are aligned with the supporting surfaces of the second component 20.

[0063] In use, when the first component 18 is rotated relative to the second component 20, the return indent 28 and arm 26 is forced outwards by riding up a tooth 22. In this way, when the rotating force is released from the first component 18, the resilient inward force of the arm 26 causes the return indent 28 to ride back down into its engaged position with the tooth 22, thereby causing the first and second components 18,20 to be realigned.

[0064] For the purposes of limiting relative rotation between the first and second components 18,20, the teeth 22 and indents 24 can have a square section. However, as will be apparent from the above, for the functioning of the return indent 28, the teeth 22 and indents 24,28 should have generally sloped side surfaces.

[0065] Finally, it will be appreciated that the resilient returning force of the cantilever arm 26 should be strong enough to overcome frictional forces to return the first and second components 18,20 to their aligned state, but should not be so great as to prevent relative rotation for the purposes of shearing the nozzles. In this regard, where the second component 20 is connected to an internal mechanism to change the spray pattern, the force required to overcome the cantilever arm 26 should be less than that required to operate the internal mechanism.

[0066] Preferably, three such return mechanisms are provided around the periphery.

[0067] Figure 6 illustrates schematically an alternative return mechanism. In this embodiment, a generally "M" shaped spring member 30 is formed on the inner surface of the first component 18. This spring member 30 can work in one of two ways. The respective tooth 22 can cause the spring member 30 to be deflected inwardly as the tooth 22 rotates relative to it. Alternatively, the spring member 30 can securely grip the side surfaces of the tooth 22, such that the central portion of the spring member 30 is actually rotated with the tooth 22 relative to the first component 18. In either case, the spring member 30 acts to return the first component 18 to the position where its supporting surfaces aligned with those of the second component 20. In an alternative embodiment, the spring member 30 is not formed integrally with the first component 18, but is made of spring steel and is merely fitted to the inner surface of the first component 18.

[0068] It is also possible for a shower head to include two or more concentric rings of nozzles 16 and such a shower head is illustrated schematically in Figures 7 and 8.

[0069] Each array of nozzles may be constructed and arranged in the manner described above. However as illustrated more clearly in Figure 9, whereas the third component 18 of the outer array of nozzles 16 is connected to or formed integrally with the bezel 12, the first component 18 of the inner array of nozzles 16 is connected to or formed integrally with the fourth component 20 of the outer array of nozzles. In this respect, Figure 10 illustrates an integral outer fourth component 18 and inner third component 20 of the type previously discussed with reference to Figure 4. Similarly, Figure 11 illustrates an outer fourth component 20 and inner third component 18 corresponding to the first and second components described with reference to Figure 5.

[0070] Thus, in use, when a user rotates the bezel 12 and outer third component 18, the outer array of nozzles 16 are sheared until the teeth 22 prevent further relative rotation with the outer fourth component 20. Further rotation of the bezel 12 will rotate the outer fourth component 20 and also the inner first component 18. This rotation will then shear the inner array of nozzles 16 until the teeth 22 of the inner array prevent further rotation with the inner second component 20. Further rotation of the bezel 12 may then be used to rotate the inner second component 20 so as to operate some internal mechanism for changing spray patterns.

[0071] For each array of nozzles 16, appropriate return mechanisms may be provided, for instance of the type illustrated in Figures 5 and 11 or Figure 6.

[0072] For ease of manufacture, it is possible to provide two or more arrays of nozzles 16 from a single moulding. Such an arrangement is illustrated in Figure 12.

Claims

1. A shower head having:

at least a first array (6) of nozzles (16) for issuing respective jets of water to form a spray pattern, each nozzle (16) being constructed of a flexible resilient material and extending continuously from an upstream portion to a downstream portion; **characterized in that**:

the shower head also has, for at least the downstream portion of each nozzle (16):

a first component (18) conforming to part of the peripheral extent of the outer surface of the nozzle (16); and

a second component (20) conforming to substantially the remainder of the peripheral extent of the outer surface of the nozzle (16), such that the downstream portion of the nozzle (16) is substantially fully supported; wherein the first (18) and second (20) components engage diametrically opposite sides of the nozzles (16) and are relatively movable so as to shear the nozzles (16).

2. A shower head according to claim 1 wherein, for each nozzle (16), the first component (18) extends along the entire length of the nozzle from the upstream portion to the downstream portion.

3. A shower head according to claim 2 wherein, at the upstream portion of each nozzle, the first component (18) surrounds the entire peripheral extent of the outer surface of the nozzle (16).

4. A shower head according to claim 3 wherein an upstream end of each nozzle (16) is formed integrally with a flange (16c) which is mounted upstream of and against an inner surface of the first component (18), the inner surface being substantially perpendicular to the extent of the nozzle (16) from the upstream portion to the downstream portion.

5. A shower head according to claim 3 or 4 wherein the upstream portion of each nozzle (16) is substantially cylindrical.

6. A shower head according to any preceding claim wherein the downstream portion of each nozzle (16) is substantially conical.

7. A shower head according to any preceding claim including a front face plate from which the jets of water issue and a rotatable bezel (12) around the periphery of the face plate, one of the first (18) and second (20) components being connected to the bezel (12) so as to cause shearing of each nozzle (16) when the bezel (12) is rotated.

8. A shower head according to any preceding claim wherein the first (18) and second (20) components are common to all of the nozzles (16) of said first array.

9. A shower head according to any preceding claim including an integral nozzle member comprising all of the nozzles (16) of said first array.

10. A shower head according to any preceding claim wherein the centres of the nozzles (16) of said first array are positioned substantially around a common circle.

11. A shower head according to any preceding claim wherein downstream surfaces of the first (18) and second (20) components form at least part of the face plate of the shower head, beyond which the nozzles (16) do not extend.

12. A shower head according to any preceding claim for producing more than one spray pattern and further comprising a movable member (12) for changing between spray patterns, one of the first (18) and second (20) components being connected to the movable member (12) so as to cause shearing of each nozzle (16) when changing between spray patterns.

13. A shower head according to claim 12 further comprising at least a second array (8,10) of nozzles for producing at least another spray pattern.

14. A shower head according to any preceding claim having at least an additional array (6) of nozzles (16) for issuing respective jets of water to form a spray pattern, each nozzle (16) being constructed of a flexible resilient material and extending continuously from an upstream portion to a downstream portion; the shower head also having, for at least the downstream portion of each nozzle (16): a third component (18) conforming to part of the peripheral extent of the outer surface of the nozzle (16); and a fourth component (20) conforming to substantially the remainder of the peripheral extent of the outer surface of the nozzle (16), such that the downstream portion of the nozzle (16) is substantially fully supported; wherein the third (18) and fourth(20) components engage diametrically opposite sides of the nozzles (16) and are relatively movable so as to shear the nozzles (16).

15. A shower head according to claim 14 wherein one of the first (18) and second (20) components of said first array (6) is formed integrally with one of the fourth (20) and third (18) components respectively of said additional array (6).

16. A method of descaling the nozzles of a shower head having nozzles (16) constructed of a flexible resilient material extending continuously from an upstream portion to a downstream portion, the method being **characterised by**:

providing for at least the downstream portion of each nozzle (16), a first component (18) conforming to part of the peripheral extent of the outer surface of the nozzle (16) and a second component (20) conforming to substantially the remainder of the peripheral extent of the outer

surface of the nozzle (16), such that the downstream portion of the nozzle (16) is substantially fully supported; and
relatively moving the first (18) and second (20) components such that they engage diametrically opposite sides of the nozzles (16) so as to shear the nozzles (16).

Patentansprüche

1. Duschkopf mit:

   mindestens einer ersten Anordnung (6) von Düsen (16) für das Austretenlassen eines jeweiligen Wasserstrahls zur Ausbildung eines Sprühmusters, wobei jede Düse (16) aus einem biegsamen, elastischen Material gebildet ist und sich durchgehend von einem stromaufwärtigen Teil zu einem stromabwärtigen Teil erstreckt; **dadurch gekennzeichnet, dass**

   der Duschkopf zumindest für den stromabwärtigen Teil jeder Düse (16) Folgendes aufweist:

   ein erstes Bestandteil (18), welches einem Teil des Randbereichs der Außenfläche der Düse (16) entspricht; und

   ein zweites Bestandteil (20), welches im Wesentlichem dem Rest des Randbereichs der Außenfläche der Düse (16) entspricht, so dass der stromabwärtige Teil der Düse (16) im Wesentlichen vollständig gestützt wird; wobei

   das erste (18) und das zweite (20) Bestandteil mit diametral gegenüberliegenden Seiten der Düsen (16) greifen und relativ beweglich sind, um die Düsen (16) zu scheren.

2. Duschkopf nach Anspruch 1, **dadurch gekennzeichnet, dass** sich für jede Düse (16) das erste Bestandteil (18) entlang der gesamten Länge der Düse von dem stromaufwärtigen Teil zu dem stromabwärtigen Teil erstreckt.

3. Duschkopf nach Anspruch 2, **dadurch gekennzeichnet, dass** am stromaufwärtigen Teil jeder Düse das erste Bestandteil (18) den gesamten Randbereich der Außenfläche der Düse (16) umgibt.

4. Duschkopf nach Anspruch 3, **dadurch gekennzeichnet, dass** ein stromaufwärtiges Ende jeder Düse (16) einstückig mit einem Flansch (16c) ausgebildet ist, welcher stromaufwärts des sowie gegen eine Innenfläche des ersten Bestandteils (18) angebracht ist, wobei die Innenfläche im Wesentlichen senkrecht zum Verlauf der Düse (16) vom stromaufwärtigen Teil zum stromabwärtigen Teil ist.

5. Duschkopf nach Anspruch 3 oder 4, **dadurch gekennzeichnet, dass** der stromaufwärtige Teil jeder Düse (16) im Wesentlichen zylindrisch ist.

6. Duschkopf nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der stromabwärtige Teil jeder Düse (16) im Wesentlichen konisch ist.

7. Duschkopf nach einem der vorhergehenden Ansprüche mit einer vorderen Stimplatte, von welcher die Wasserstrahle austreten, und einem drehbaren Ring (12) um den Umfang der Stirnplatte, wobei entweder das erste (18) oder das zweite (20) Bestandteil mit dem Ring (12) so verbunden ist, dass es ein Scheren jeder Düse (16) verursacht, wenn der Ring (12) gedreht wird.

8. Duschkopf nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das erste (18) und das zweite (20) Bestandteil allen Düsen (16) der ersten Anordnung gemein sind.

9. Duschkopf nach einem der vorhergehenden Ansprüche mit einem integralen Düsenelement, welches alle Düsen (16) der ersten Anordnung umfasst.

10. Duschkopf nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Mitten der Düsen (16) der ersten Anordnung im Wesentlichen um einen gemeinsamen Kreis angeordnet sind.

11. Duschkopf nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die stromabwärtigen Flächen des ersten (18) und des zweiten (20) Bestandteils mindestens einen Teil der Stirnplatte des Duschkopfes bilden, über welchen sich die Düsen (16) nicht hinaus erstrecken.

12. Duschkopf nach einem der vorhergehenden Ansprüche für das Erzeugen von mehr als einem Sprühmuster, welcher weiterhin ein bewegliches Element (12) für das Wechseln zwischen den Sprühmustern umfasst, wobei entweder das erste (18) oder das zweite (20) Bestandteil mit dem beweglichen Element (12) verbunden ist, um bei Wechsel zwischen den Sprühmustern ein Scheren jeder Düse (16) zu verursachen.

13. Duschkopf nach Anspruch 12, welcher weiterhin mindestens eine zweite Anordnung (8, 10) von Düsen für das Erzeugen mindestens eines weiteren

Sprühmusters umfasst.

14. Duschkopf nach einem der vorhergehenden Ansprüche mit mindestens einer weiteren Anordnung (6) von Düsen (16) für das Austretenlassen eines jeweiligen Wasserstrahls, um ein Sprühmuster zu bilden, wobei jede Düse (16) aus einem biegsamen, elastischen Material gebildet ist und sich durchgehend von einem stromaufwärtigen Teil zu einem stromabwärtigen Teil erstreckt; der Duschkopf zumindest für den stromabwärtigen Teil jeder Düse (16) Folgendes aufweist: ein drittes Bestandteil (18), welches einem Teil des Randbereichs der Außenfläche der Düse (16) entspricht; und ein viertes Bestandteil (20), welches im Wesentlichem dem Rest des Randbereichs der Außenfläche der Düse (16) entspricht, so dass der stromabwärtige Teil der Düse (16) im Wesentlichen vollständig gestützt wird; wobei das dritte (18) und das vierte (20) Bestandteil mit diametral gegenüberliegenden Seiten der Düsen (16) greifen und relativ beweglich sind, um die Düsen (16) zu scheren.

15. Duschkopf nach Anspruch 14, **dadurch gekennzeichnet, dass** entweder das erste (18) oder das zweite (20) Bestandteil der ersten Anordnung (6) einstückig mit entweder dem vierten (20) oder dem dritten (18) Bestandteil der weiteren Anordnung (6) ausgebildet ist.

16. Verfahren zum Entkalken der Düsen eines Duschkopfes mit Düsen (16), welche aus einem biegsamen, elastischen Material ausgebildet sind, das sich durchgehend von einem stromaufwärtigen Teil zu einem stromabwärtigen Teil erstreckt, wobei das Verfahren durch Folgendes gekennzeichnet ist:

für mindestens den stromabwärtigen Teil jeder Düse (16) Vorsehen eines ersten Bestandteils (18), welches einem Teil des Randbereichs der Außenfläche der Düse (16) entspricht, und eines zweiten Bestandteils (20), welches im Wesentlichen dem Rest des Randbereichs der Außenfläche der Düse (16) entspricht, so dass der stromabwärtige Teil der Düse (16) im Wesentlichen voll gestützt wird; und

relatives Bewegen des ersten (18) und des zweiten (20) Bestandteils, so dass sie mit diametral gegenüberliegenden Seiten der Düsen (16) greifen, um die Düsen (16) zu scheren.

Revendications

1. Pomme de douche ayant :

au moins une première rangée (6) de buses (16) pour produire des jets d'eau respectifs afin de former une configuration de pulvérisation, chaque buse (16) étant constituée d'un matériau résilient souple et s'étendant en continu depuis une portion amont vers une portion aval, **caractérisée en ce que** :

la pomme de douche a aussi, pour au moins la portion aval de chaque buse (16) :

un premier composant (18) s'adaptant à une partie de l'étendue périphérique de la surface extérieure de la buse (16) et

un second composant (20) s'adaptant sensiblement au reste de l'étendue périphérique de la surface extérieure de la buse (16), de sorte que la portion aval de la buse (16) est sensiblement entièrement supportée,

les premier (18) et second (20) composants venant en engagement avec des côtés diamétralement opposés des buses (16) et étant mobiles relativement de façon à cisailler les buses (16).

2. Pomme de douche selon la revendication 1 dans laquelle, pour chaque buse (16), le premier composant (18) s'étend le long de la totalité de la longueur de la buse depuis la portion amont vers la portion aval.

3. Pomme de douche selon la revendication 2 dans laquelle, sur la portion amont de chaque buse, le premier composant (18) entoure la totalité de l'étendue périphérique de la surface extérieure de la buse (16).

4. Pomme de douche selon la revendication 3 dans laquelle une extrémité amont de chaque buse (16) est formée d'un seul tenant avec une bride (16c) qui est montée en amont de et contre une surface intérieure du premier composant (18), la surface intérieure étant sensiblement perpendiculaire à l'étendue de la buse (16) depuis la portion amont vers la portion aval.

5. Pomme de douche selon la revendication 3 ou 4 dans laquelle la portion amont de chaque buse (16) est sensiblement cylindrique.

6. Pomme de douche selon l'une quelconque des revendications précédentes dans laquelle la portion aval de chaque buse (16) est sensiblement conique.

7. Pomme de douche selon l'une quelconque des re-

vendications précédentes comprenant une plaque frontale d'où sortent les jets d'eau et un biseau rotatif (12) autour de la périphérie de la plaque frontale, l'un des premier (18) et second (20) composants étant relié au biseau (12) de façon à provoquer le cisaillement de chaque buse (16) quand le biseau (12) est mis en rotation.

8. Pomme de douche selon l'une quelconque des revendications précédentes dans laquelle les premier (18) et second (20) composants sont communs à l'ensemble des buses (16) de ladite première rangée.

9. Pomme de douche selon l'une quelconque des revendications précédentes comportant un élément à buses d'un seul tenant comprenant la totalité des buses (16) de ladite première rangée.

10. Pomme de douche selon l'une quelconque des revendications précédentes dans laquelle les centres des buses (16) de ladite première rangée sont positionnés sensiblement autour d'un cercle commun.

11. Pomme de douche selon l'une quelconque des revendications précédentes dans laquelle les surfaces aval des premier (18) et second (20) composants forment au moins partie de la plaque frontale de la pomme de douche, au-delà de laquelle les buses (16) ne s'étendent pas..

12. Pomme de douche selon l'une quelconque des revendications précédentes pour produire plus d'une configuration de pulvérisation et comprenant en outre un élément mobile (12) destiné à permuter entre les configurations de pulvérisation, l'un des premier (18) et second (20) composants étant relié à l'élément mobile (12) de façon à provoquer le cisaillement de chaque buse (16) en permutant entre les configurations de pulvérisation.

13. Pomme de douche selon la revendication 12 comprenant en outre au moins une seconde rangée (8, 10) de buses pour produire au moins une autre configuration de pulvérisation.

14. Pomme de douche selon l'une quelconque des revendications précédentes ayant au moins une rangée supplémentaire (6) de buses (16) pour produire des jets d'eau respectifs afin de former une configuration de pulvérisation, chaque buse (16) étant composée d'un matériau résilient souple et s'étendant en continu depuis une portion amont vers une portion aval ; la pomme de douche ayant aussi, pour au moins la portion aval de chaque buse (16) : un troisième composant (18) s'adaptant à une partie de l'étendue périphérique de la surface extérieure de la buse (16) et un quatrième composant (20) s'adaptant sensiblement au reste de l'étendue périphérique de la surface extérieure de la buse (16), de sorte que la portion aval de la buse (16) est sensiblement entièrement supportée, les troisième (18) et quatrième (20) composants venant en engagement des côtés diamétralement opposés des buses (16) et étant mobiles relativement de façon à cisailler les buses (16).

15. Pomme de douche selon la revendication 14 dans laquelle l'un des premier (18) et second (20) composants de ladite première rangée (6) est formé d'un seul tenant avec l'un des quatrième (20) et troisième (18) composants respectivement de ladite rangée supplémentaire (6).

16. Procédé de détartrage des buses d'une pomme de douche ayant des buses (16) composées d'un matériau résilient souple s'étendant en continu depuis une portion amont vers une portion aval, le procédé étant **caractérisé par** le fait de :

prévoir au moins la portion aval de chaque buse (16), un premier composant (18) s'adaptant à une partie de l'étendue périphérique de la surface extérieure de la buse (16) et un second composant (20) s'adaptant sensiblement au reste de l'étendue périphérique de la surface extérieure de la buse (16), de sorte que la portion aval de la buse (16) est sensiblement entièrement supportée et

déplacer relativement les premier (18) et second (20) composants de sorte qu'ils viennent en engagement des côtés diamétralement opposés des buses (16) de façon à cisailler les buses (16).

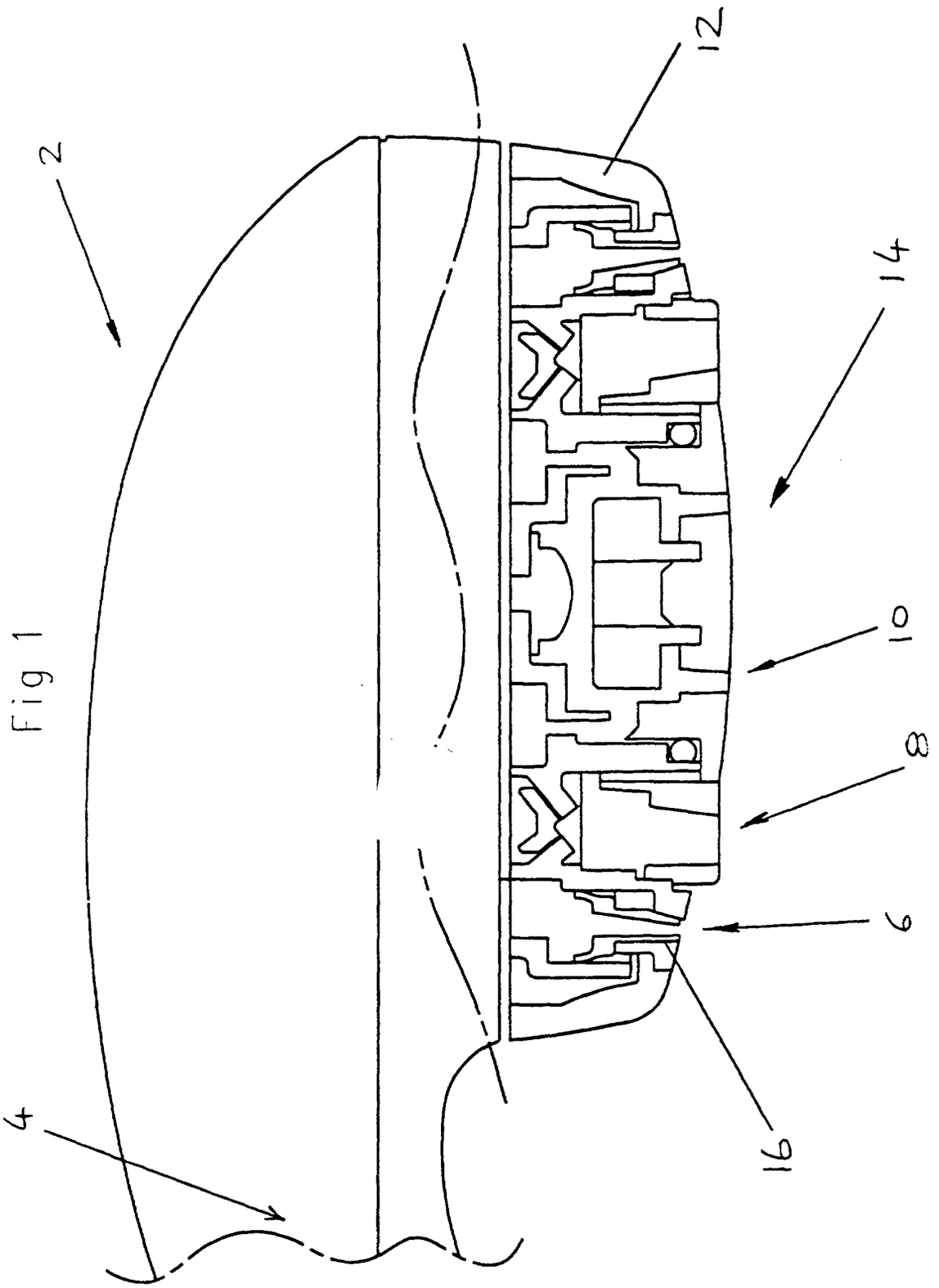


Fig 1

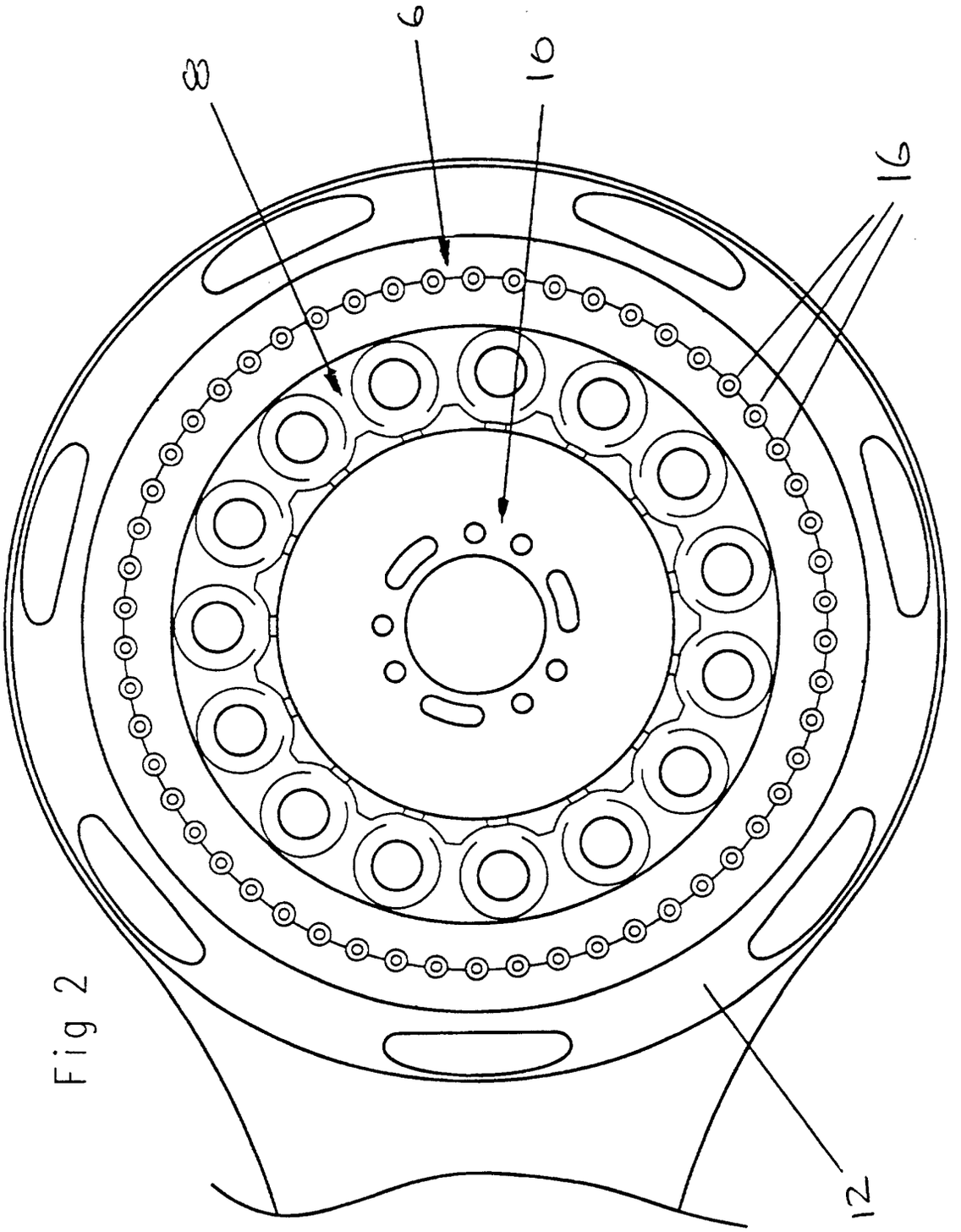


Fig 2

Fig 3

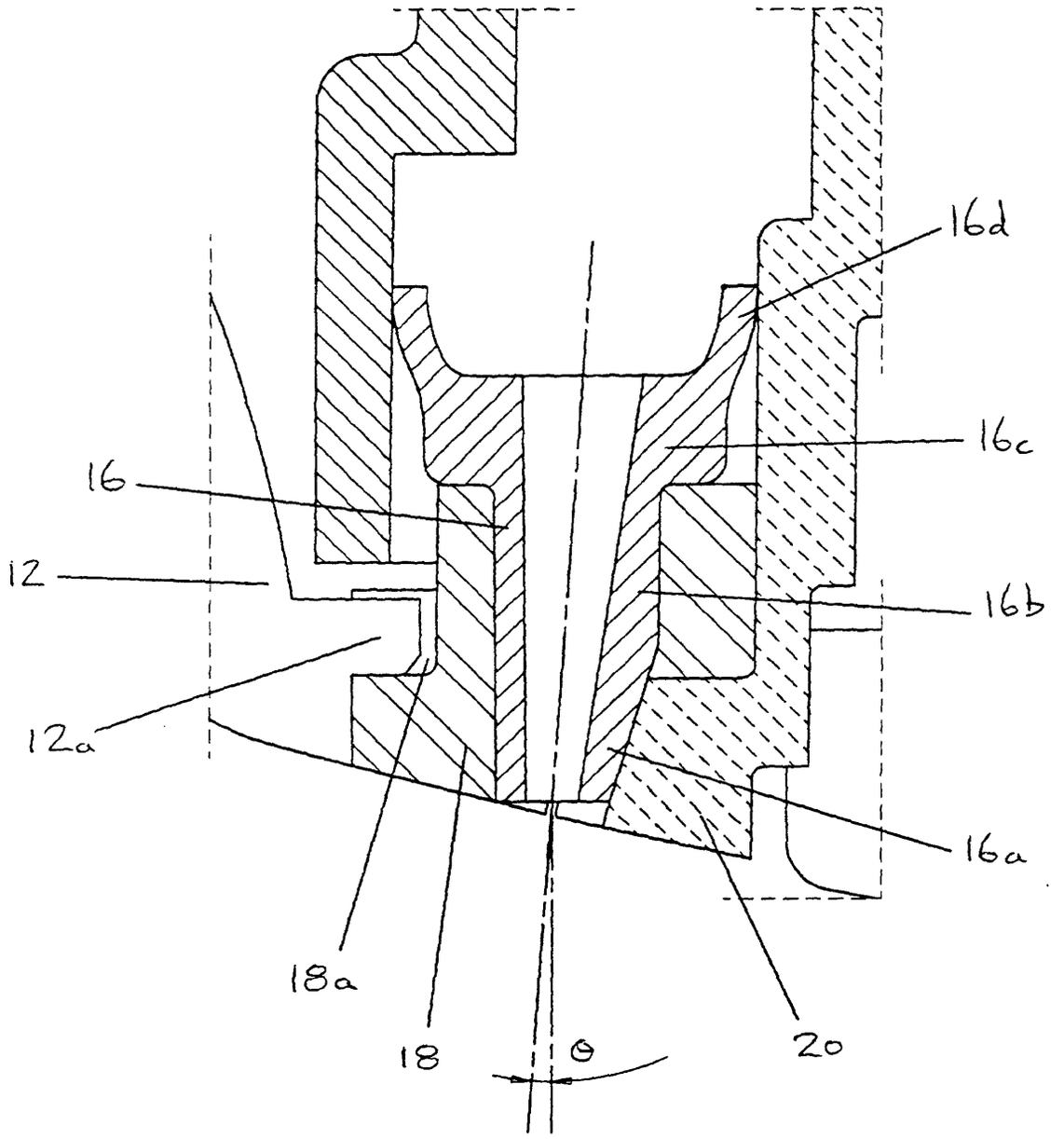


FIG 4

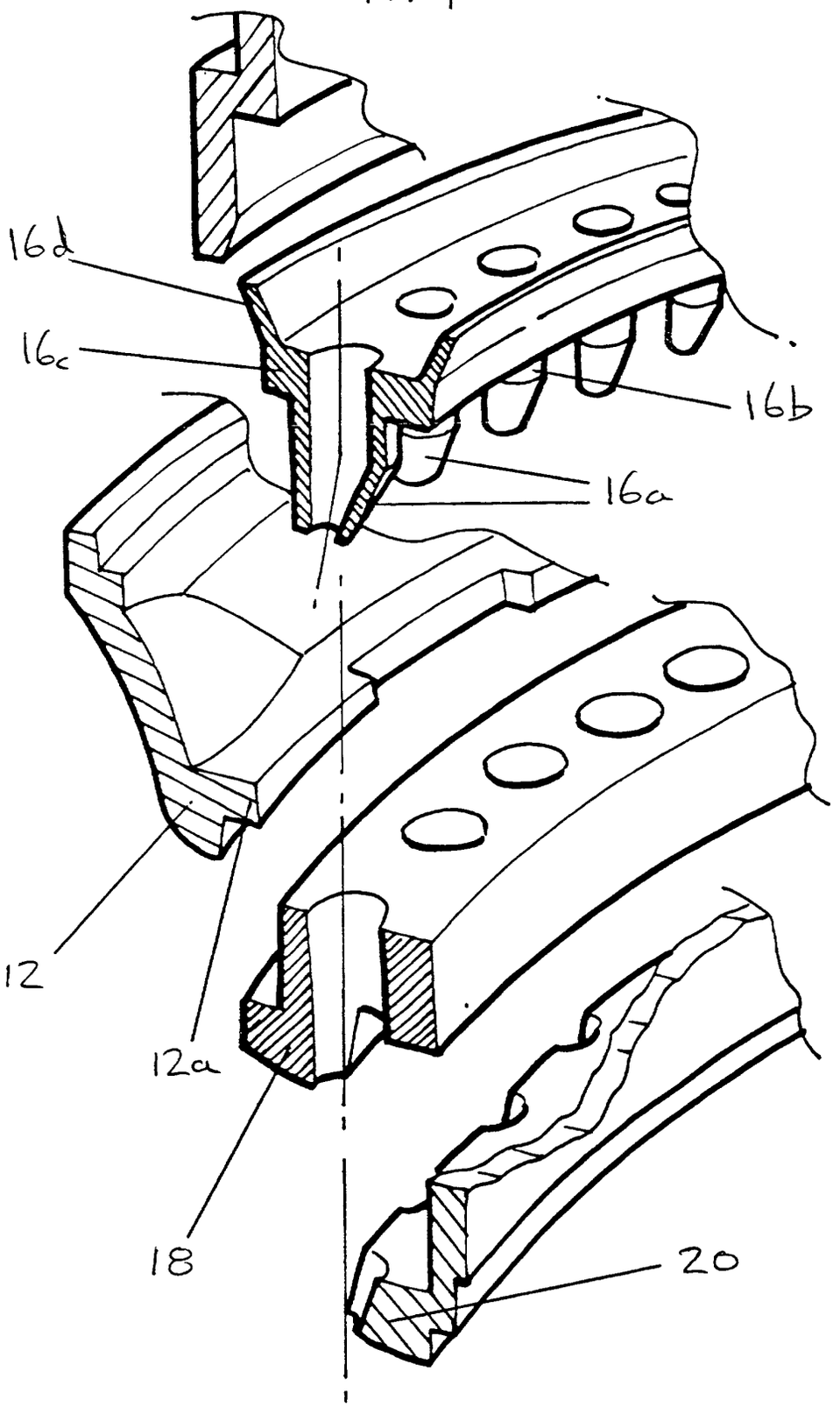
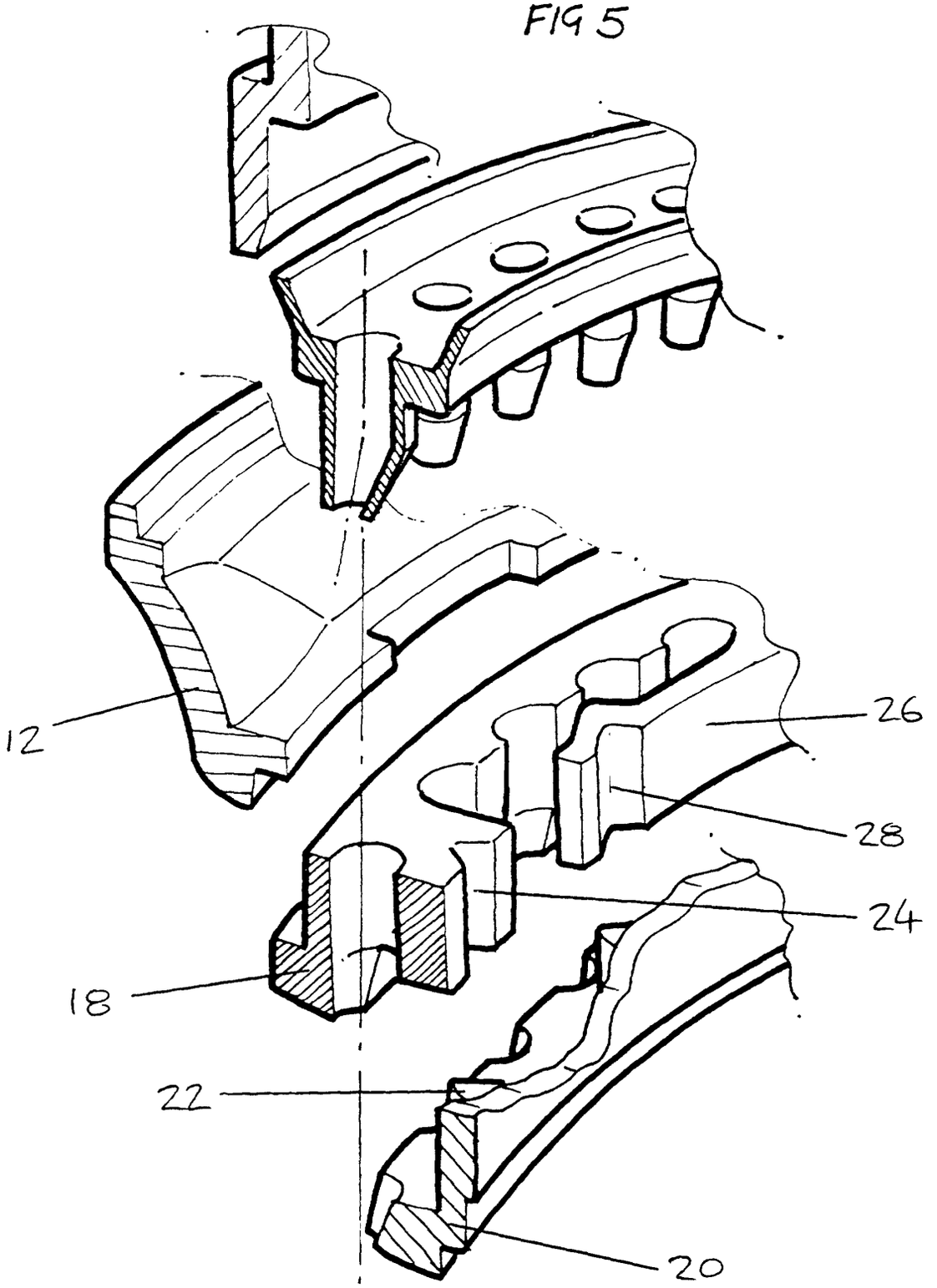


FIG 5



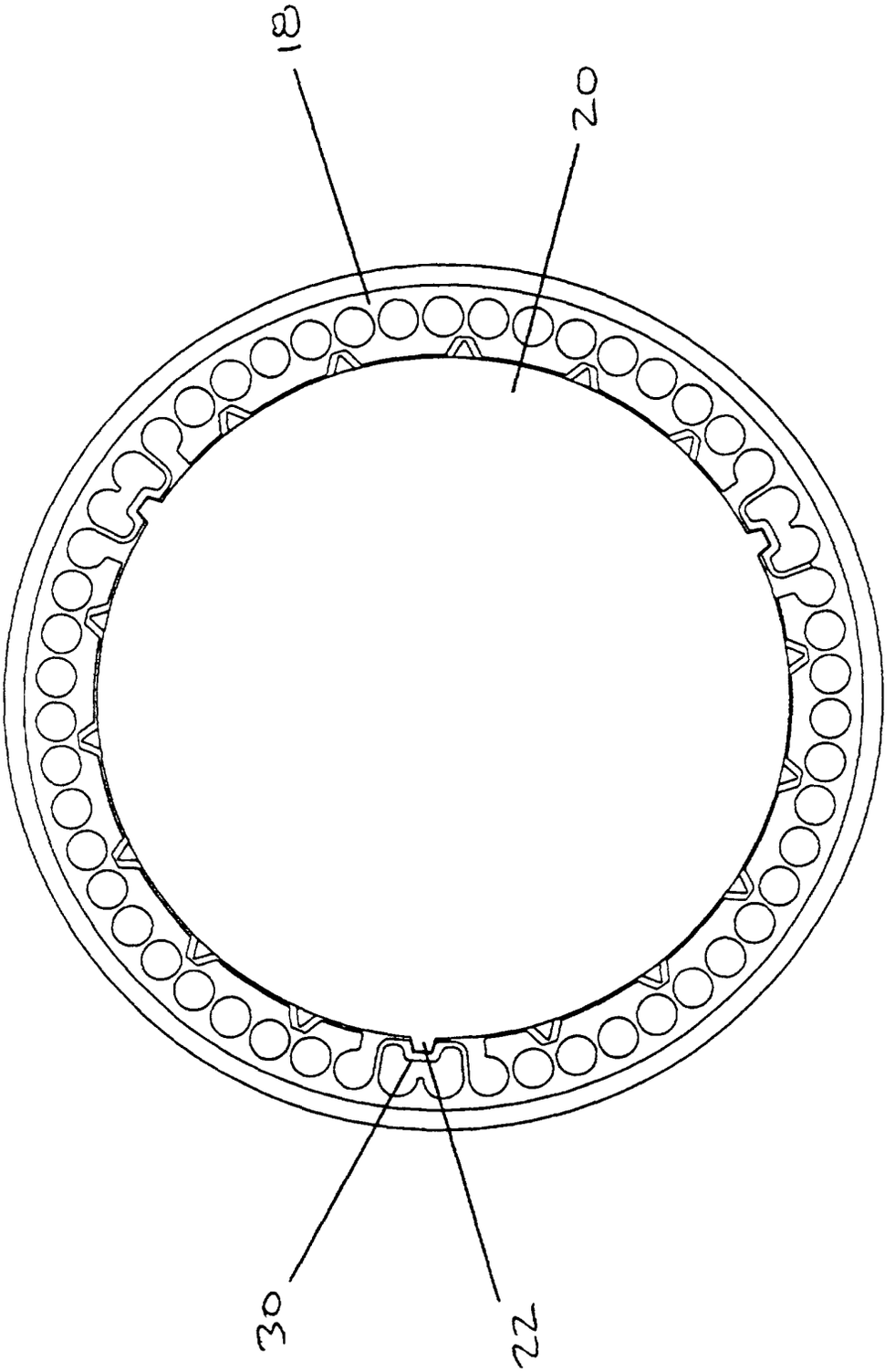


Fig 6

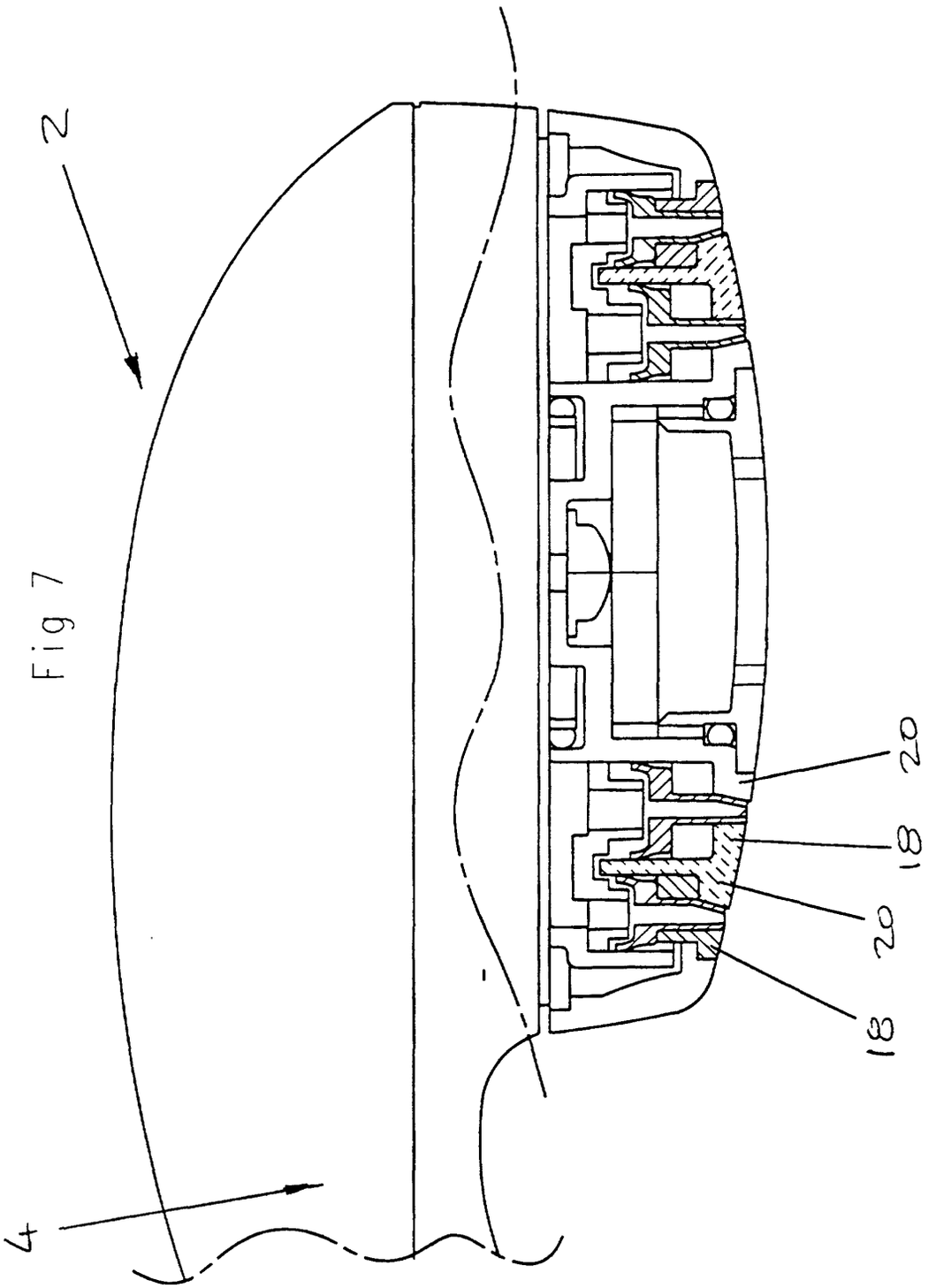


Fig 7

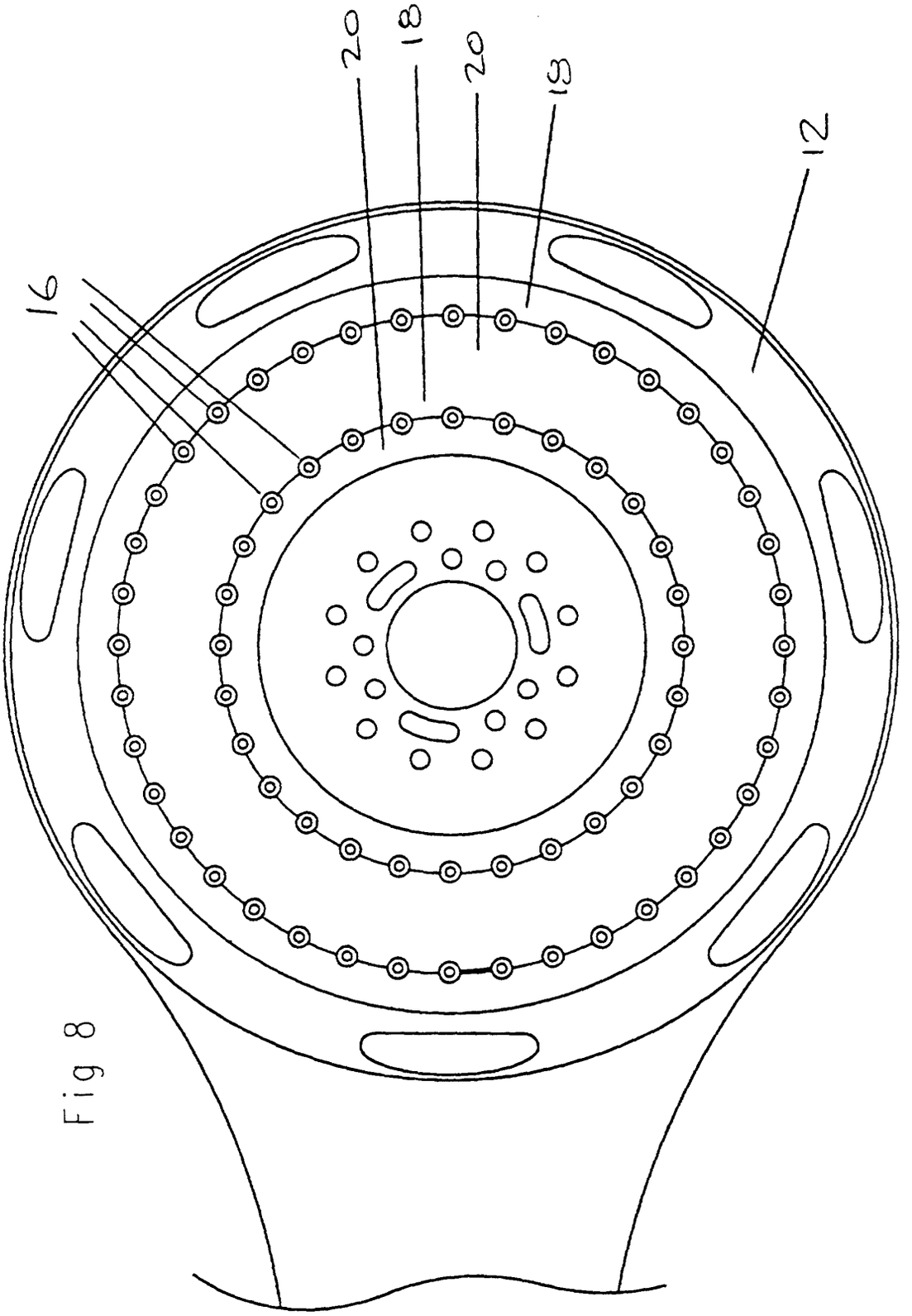


Fig 8

Fig 9

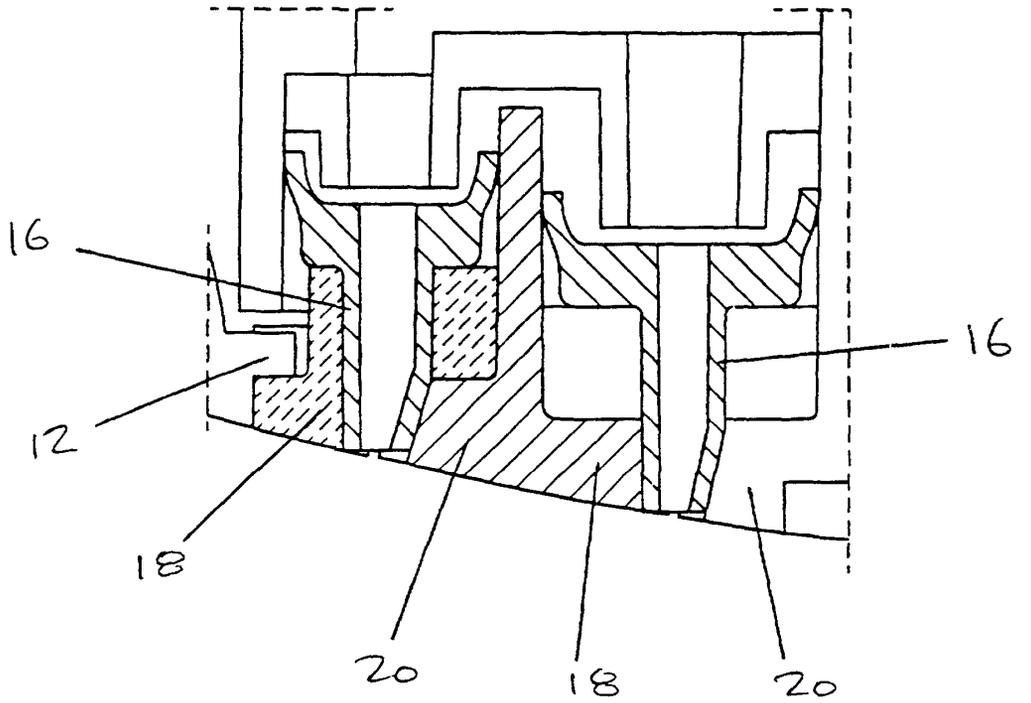


Fig 12

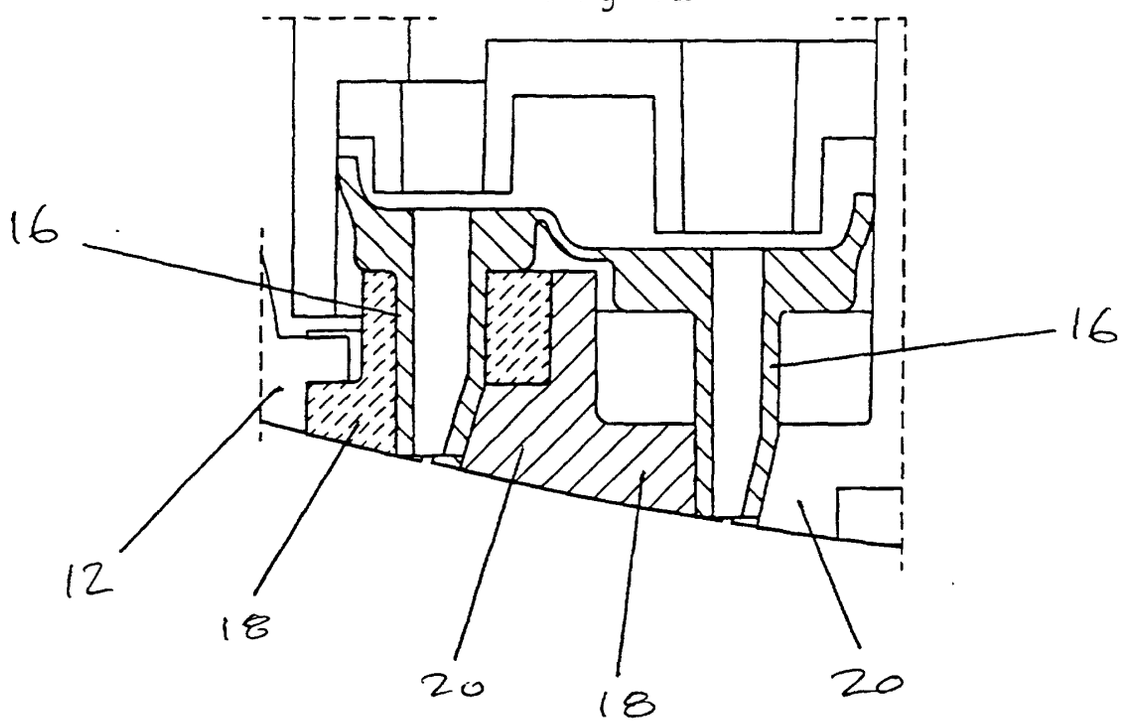


FIG 10

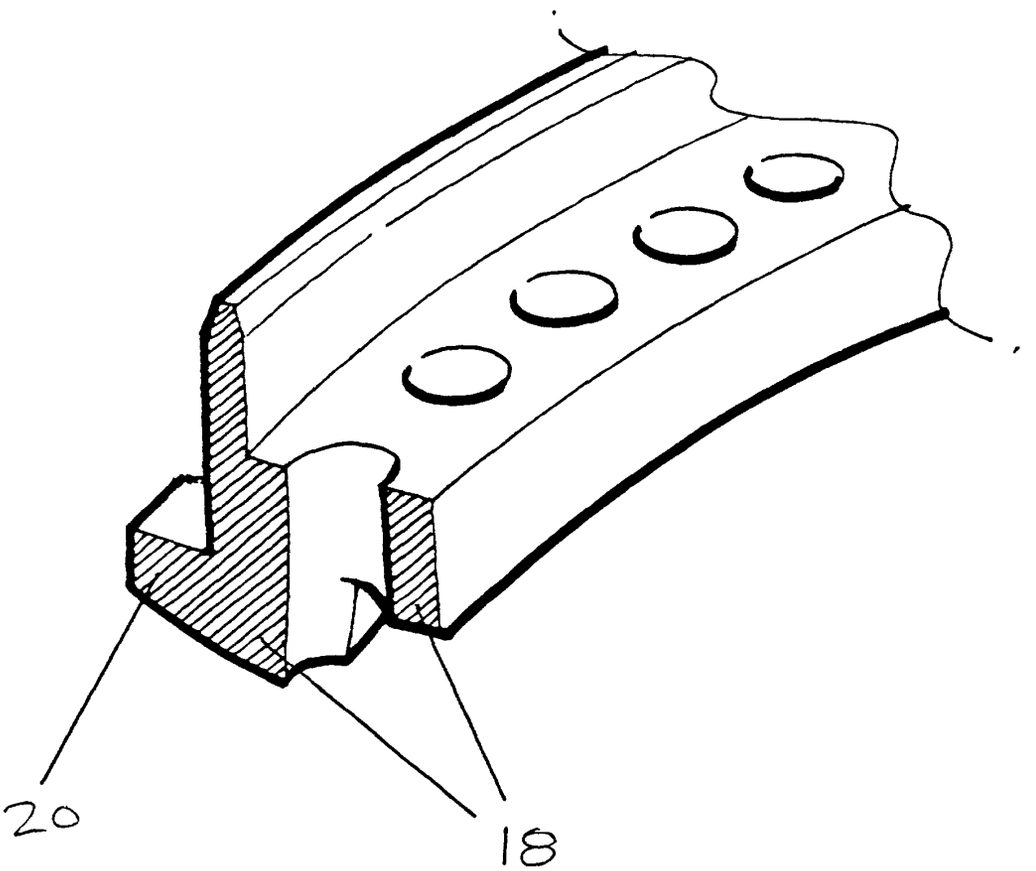


FIG 11