caused by difference in diameters of the cylinder and the scaffold is a huge problem. The goal is typically to provide a snug fit between the inner walls of the scaffold and the outer wall of the cylinder, however it is very difficult to meet this kind of small tolerances in production and especially since welding causes thermal expansion that may cause buckling of the woven filter wall of the cylinder.

There is hence a need for a new design of a flow distributor that allows a simplified flow distributor.

Summary of the invention

According to a first aspect, the invention provides a cylindrical flow distributor for performing, by means of solid reaction members, a biological or chemical transformation, or physical or chemical trapping from, or release of agents to, a fluidic media, the flow distributor comprising:

a top wall;

a bottom wall comprising a central through going opening; and

an outer wall extending between the top wall and the bottom wall;

wherein the top wall, the bottom wall and an inner envelope surface of said outer wall together define a confinement configured to contain solid reaction members or a rigid body of a reaction member material; and

wherein the outer wall comprises a first plurality of longitudinally extending ribs arranged side by side along a longitudinal centerline CL of the flow distributor with gaps extending in the circumferential direction between two adjacent ribs, and a circumferentially extending first scaffold encircling and being fixedly attached to a peripheral outer surface of said plurality of longitudinally extending ribs.

The cylindrical flow distributor further comprises an inner wall comprising a second scaffold having an extension along the longitudinal center line of the flow distributor, and a plurality of consecutive turns of a second wire being fixedly attached to an outer surface of said second scaffold, such that axially extending gaps are formed between each turn of said second wire, wherein the top wall, the bottom wall, the inner envelope surface of the outer wall and an outer envelope surface of the inner wall facing the outer wall together define the confinement configured to contain solid reaction members or a rigid body of a reaction member material.

Thereby a cylindrical flow distributor is provided in which a confinement is defined by the top wall, the bottom wall and the outer wall. Before use of the flow distributor, the confinement is provided with loosely arranged solid reaction members or one or more cartridges holding such solid reaction members, or a rigid body of a reaction member material (monolithic). In use, the flow distributor containing such

20-800 µm and even more preferred 20-500 µm as measured in the axial direction along the outer envelope surface of said inner wall. The width should be small enough to prevent solid reaction members or a rigid body of a reaction member material (monolithic) configured to be contained in the confinement from being released there through. Still, the width must be large enough from unduly restricting a fluid flow there through.

The second wire may have a triangular or trapezoid cross section, and the second wire may be fixedly attached to an outer surface of the second scaffold via its apex in the event of the cross section being triangular or via its shortest parallel edge in the event of the cross section being trapezoid, whereby the gaps extending between two adjacent turns of the second wire as measured along the outer envelope surface of said inner wall facing the outer wall is smaller than the gaps extending between two adjacent turns of the second wire as measured along an inner envelope surface of said inner wall facing away from the outer wall.

Accordingly, the outer envelope surface of the inner wall of the flow distributor will be formed by the base of the second wire in the event the wire having a triangular cross section and by the long parallel edge in the event the wire having a trapezoid cross section. No matter cross section, the outer envelope surfaces of the inner wall will be cylindrical. Since the wire typically is extruded, the skilled person will understand that production tolerances may hinder the edge portions no matter cross section from being completely straight.

The second scaffold may comprise a second plurality of axially extending ribs. One purpose of the second scaffold is to fixate the second wire to thereby provide a robust inner wall structure to the flow distributor. The plurality of ribs may be arranged side by side with gaps extending in the circumferential direction between two adjacent ribs. The number of ribs should be adapted so that it does not unduly interfere with the radial fluid flow through the gaps to be established during use of the flow distributor

The top wall may be configured to support a shaft, said shaft being configured to be connected to a means, such as a motor, for rotating the cylindrical flow distributor. It is to be understood that other positions of the shaft are possible.

At least one of the top wall or the bottom wall may be removably connected to the outer wall or to the inner wall. Thereby the flow distributor may be easily disassembled to allow loading and unloading of the confinement with solid reaction members or a rigid body of a reaction member material, but also to facilitate cleaning of the confinement.

CLAIMS

1. A cylindrical flow distributor for performing, by means of solid reaction members, a biological or chemical transformation, or physical or chemical trapping from, or release of agents to, a fluidic media, the flow distributor (100) comprising:

a top wall (1);

a bottom wall (2) comprising a central through going opening (13);

an outer wall (3) extending between the top wall (1) and the bottom wall (2); and

an inner wall (4);

wherein the outer wall (3) comprises a first plurality of longitudinally extending ribs (20) arranged side by side along a longitudinal centerline CL of the flow distributor (100) with gaps (21) extending in the circumferential direction between two adjacent ribs (20), and a circumferentially extending first scaffold (22) encircling and being fixedly attached to a peripheral outer surface (29) of said plurality of longitudinally extending ribs (20);

wherein the inner wall (4) comprises a second scaffold (30) having an extension along an axial direction of the flow distributor (100), and a plurality of consecutive turns of a second wire (31) being fixedly attached to an outer surface (32) of said second scaffold (30), such that axially extending gaps (33) are formed between each turn of said second wire (31); and

wherein the top wall (1), the bottom wall (2), an inner envelope surface (5) of the outer wall (3) and an outer envelope surface (6) of the inner wall (4) facing the outer wall (3) together define a confinement (7) configured to contain solid reaction members or a rigid body of a reaction member material.

2. A cylindrical flow distributor according to claim 1, wherein the first scaffold (22) is a first wire (26) spiral wound around the peripheral outer surface (29) of said first plurality of longitudinally extending ribs (20).

3. A cylindrical flow distributor according to claim 1 or 2, wherein the gaps (21) extending between two adjacent ribs (20) have a width W_A as measured along the inner envelope surface of said confinement (7) being smaller than the size of solid reaction members or the rigid body of a reaction member material to be contained in the confinement (7).

4. A cylindrical flow distributor according to any of the preceding claims,

wherein each rib (20) in the first plurality of ribs (20) has a triangular or trapezoid cross section, and wherein each rib (20) is fixedly attached to an inner surface of the first scaffold (22) via its apex in the event of the cross section being triangular or via its shortest parallel edge in the event of the cross section being trapezoid, whereby the gaps (21) extending between two adjacent ribs (20) as measured along the inner envelope surface (5) of said outer wall (3) is smaller than the gaps (27) extending between two adjacent ribs (20) as measured along an outer envelope surface (28) of said outer wall (3).

5. A cylindrical flow distributor according to claim 1, wherein the gaps (33) between each turn of said second wire (31) have a width as measured in the axial direction along the outer envelope surface (6) of said inner wall (4) being smaller than the size of solid reaction members or the rigid body of a reaction member material to be contained in the confinement (7).

6. A cylindrical flow distributor according to any of the preceding claims, wherein the second wire (31) has a triangular or trapezoid cross section, and wherein the second wire (31) is fixedly attached to the outer surface (32) of the second scaffold (30) via its apex in the event of the cross section being triangular or via its shortest parallel edge in the event of the cross section being trapezoid, whereby the gaps (33) extending between two adjacent turns of the second wire (31) as measured along the outer envelope surface (6) of said inner wall (4) facing the outer wall (3) is smaller than gaps (35) extending between two adjacent turns of the second wire (31) as measured along an inner envelope surface (36) of said inner wall (4).

7. A cylindrical flow distributor according to any of claims 4-6, wherein the second scaffold (30) comprises a second plurality of axially extending ribs (34).

8. A reactor for performing, by means of solid reaction members, a biological or chemical transformation, or physical or chemical trapping from, or release of agents to, a fluidic media, said reactor comprising a vessel (200) in which a cylindrical flow distributor (100) has been mounted, said cylindrical flow distributor (100) comprising:

a top wall (1);

a bottom wall (2) comprising a central through going opening (13);

an outer wall (3) extending between the top wall (1) and the bottom wall (2);

an inner wall (4); and

a means for rotating the cylindrical flow distributor (100);

wherein the outer wall (3) comprises a first plurality of longitudinally extending ribs (20) arranged side by side along a longitudinal centerline CL of the flow distributor with gaps (21) extending in the circumferential direction between two adjacent ribs (20), and a circumferentially extending first scaffold (22) encircling and being fixedly attached to a peripheral outer surface (29) of said plurality of longitudinally extending ribs (20),

wherein the inner wall (4) comprises a second scaffold (30) having an extension along an axial direction of the flow distributor (100), and a plurality of consecutive turns of a second wire (31) being fixedly attached to an outer surface (32) of said second scaffold (30), such that axially extending gaps (33) are formed between each turn of said second wire (31); and

wherein the top wall (1), the bottom wall (2), an inner envelope surface (5) of the outer wall (3) and an outer envelope surface (6) of the inner wall (4) facing the outer wall (3) together define a confinement (7) configured to contain solid reaction members or a rigid body of a reaction member material.

9. Use of a reactor according to claim 8 for performing by means of solid reaction members, a biological or chemical transformation, or physical or chemical trapping from, or release of agents to, a fluidic media.