Claims

1. A support matrix arrangement (9) for a porous material, the matrix arrangement (9) comprising:

a first planar member (1) and a second planar member (2) overlaying each other with the porous material (24) between them so as to provide a diffuse flow of fluid across the arrangement in use,

wherein each planar member (1,2) comprises a frame (3,4) and ribbon elements (5,6) extending across said frame to present the porous material (24) in a substantially flat configuration,

characterised in that the ribbon elements (5,6) have at least one deflector portion (7,8) shaped to accommodate thermal expansion or contraction of the ribbon elements by arching substantially in the plane (X-Y) of each planar member (1,2).

2. An arrangement as claimed in claim 1 wherein the deflector portions (7) in the first planar member (1) mirror the deflector portions in the second planar member (2) either side of the respective overlaying ribbon elements (5, 6).

3. An arrangement as claimed in claim 1 or claim 2 wherein the at least one deflector portion (7, 8) comprises a loop.

4. An arrangement as claimed in any of claims 1, 2 or 3 wherein the porous material comprises a flaccid material (24).

5. An arrangement as claimed in claim 1 wherein the frame comprises a plurality of sides and the ribbon elements (5,6) extend from one side of the frame to another side in the form of lateral ribbon elements (5a,5b).

6. An arrangement as claimed in claim 5 wherein the deflector portions (7a,8a) in lateral ribbon elements (5a,

6a) have a bulbous necked loop configuration, that is to say similar to an Omega sign.

7. An arrangement as claimed in claim 5 or claim 6 wherein intermediate ribbon elements (5b,6b) extend between lateral ribbon elements (5a,6a).

8. An arrangement as claimed in claim 7 wherein deflector portions (7b,8b) in intermediate ribbon elements (5b,6b) have a U loop configuration.

9. An arrangement as claimed in claim 7 or claim 8 wherein intermediate ribbon elements (5b,6b) are substantially S shaped and extend from a base portion of deflector portions (7a,8c) in lateral ribbon elements (5a,6c).

10. An arrangement as claimed in any preceding claim wherein the ribbon elements (5,6) have a width less than or equal to the thickness of the planar members (1,2).

11. An arrangement as claimed in any preceding claim wherein the support matrix arrangement is part of a flow regulator or meter for a gas flow (22) with the porous material acting as a diffuser between the planar members (1,2;25,26).

12. An arrangement as claimed in claim 11 wherein the diffuser is arranged to be located relative to a work piece (20) at a shape memory deposition or weld site (20,21) for a welding process such that the gas flow (22)provides local shielding about the work piece.

13. An arrangement as claimed in claim 12, wherein the local shielding comprises a homogeneous vortex free gas cloud about the work piece (20).

CLAIMS:

1. A support matrix arrangement (9) to support a porous material utilised to act as a diffuser in relation to creating a gas shield to protect a weld site or shape metal deposition process, the matrix arrangement (9) comprising:

   a first planar member (1) and a second planar member (2) overlaying each other with the porous material (24) between them so as to provide a diffuse flow of fluid across the arrangement in use, **characterised in that**
   each planar member (1,2) comprises a frame (3,4) and ribbon elements (5,6) extending across said frame to present the porous material (24) in a substantially flat configuration, wherein the ribbon elements (5,6) have at least one deflector portion (7,8) shaped to accommodate thermal expansion or contraction of the ribbon elements by arching substantially in the plane (X-Y) of each planar member (1,2).

2. An arrangement as claimed in claim 1 wherein the deflector portions (7) in the first planar member (1) mirror the deflector portions in the second planar member (2) either side of the respective overlaying ribbon elements (5, 6).

3. An arrangement as claimed in claim 1 or claim 2 wherein the at least one deflector portion (7, 8) comprises a loop.

4. An arrangement as claimed in any of claims 1, 2 or 3 wherein the porous material comprises a flaccid material (24).

5. An arrangement as claimed in claim 1 wherein the frame comprises a plurality of sides and the ribbon elements (5,6) extend from one side of the frame to another side in the form of lateral ribbon elements (5a,5b).

6. An arrangement as claimed in claim 5 wherein the deflector portions (7a,8a) in lateral ribbon elements (5a, 6a) have a bulbous necked loop configuration, that is to say similar to an Omega sign.

7. An arrangement as claimed in claim 5 or claim 6 wherein intermediate ribbon elements (5b,6b) extend between lateral ribbon elements (5a,6a).

8. An arrangement as claimed in claim 7 wherein deflector portions (7b,8b) in intermediate ribbon elements (5b,6b) have a U loop configuration.

9. An arrangement as claimed in claim 7 or claim 8 wherein intermediate ribbon elements (5b,6b) are substantially S shaped and extend from a base portion of deflector portions (7a,8c) in lateral ribbon elements (5a,6c).

10. An arrangement as claimed in any preceding claim wherein the ribbon elements (5,6) have a width less than or equal to the thickness of the planar members (1,2).

11. An arrangement as claimed in any preceding claim wherein the support matrix arrangement is part of a flow regulator or meter for a gas flow (22) with the porous material acting as a diffuser between the planar members (1, 2; 25, 26).

12. An arrangement as claimed in claim 11 wherein the diffuser is arranged to be located relative to a work piece (20) at a shape memory deposition or weld site (20,21) for a welding process such that the gas flow (22) provides local shielding about the work piece.

13. An arrangement as claimed in claim 12, wherein the local shielding comprises a homogeneous vortex free gas cloud about the work piece (20).