necessary to join the butt flange adapter to the non-flanged polymer pipe. This requires a fusing machine, which requires power or a heat source for operation. The fusing operation itself takes time and is affected by the weather when joints are to be made in the field. For example, cold weather will slow the fusing process, and can stop it entirely if severe enough. There is clearly a need for improved components and a method for joining non-flanged polymer pipe elements to flanged pipe elements.

Summary

According to an aspect of the present invention, there is provided a coupling for joining a flanged pipe element to a plain end pipe element. The coupling comprises a plurality of segments attached to one another in spaced apart relation end to end surrounding a central space. Each of the segments comprises first and second sides oppositely disposed. A first channel is positioned proximate to the first side and extends circumferentially around and facing the central space. A first flange is positioned proximate to the second side and extends outwardly away from the central space. The first flange has a plurality of holes therethrough. A second channel is positioned between the first channel and the flange and extends circumferentially around and faces the central space. The coupling further comprises a split ring positioned in the first channel. A seal is positioned in the second channel. A tube is positioned within the central space and extends outwardly from the second sides of the segments. The tube engages the seal. A second flange may extend outwardly from the tube and positioned adjacent to the first flange. A barb may extend outwardly from the tube proximate one end thereof.

In an example embodiment the first channel comprises two side surfaces arranged in spaced relation. At least one of the segments may have at least one notch positioned in the two side surfaces adjacent to an end of the at least one segment. A floor surface extends between the side surfaces. The floor surface comprises first and second surface portions arranged respectively at opposite ends of the segments. A third surface portion is positioned between the first and second surface portions. The first and second surface portions each have a radius of curvature greater than a radius

What is claimed is:

1. A coupling for joining a flanged pipe element to a plain end pipe element, said coupling comprising:

a plurality of segments attached to one another in spaced apart relation end to end surrounding a central space, each of said segments comprising:

first and second sides oppositely disposed;

a first channel positioned proximate to said first side and extending circumferentially around and facing said central space;

a first flange positioned proximate to said second side and extending outwardly away from said central space, said first flange having a plurality of holes therethrough;

a second channel positioned between said first channel and said flange and extending circumferentially around and facing said central space; wherein said coupling further comprises:

a split ring positioned in said first channel;

a seal positioned in said second channel;

a tube positioned within said central space and extending outwardly from said second sides of said segments, said tube engaging said seal.

2. The coupling according to claim 1, wherein said first channel comprises:

two side surfaces arranged in spaced relation;

a floor surface extending between said side surfaces, said floor surface comprising first and second surface portions arranged respectively at opposite ends of said segments and a third surface portion positioned therebetween, said first and second surface portions each having a radius of curvature greater than a radius of curvature of said third surface portion.

3. The coupling according to claim 2, wherein said radius of curvature of said first and second surface portions on at least one of said segments is equal to an outer radius of curvature of said split ring.

4. The coupling according to claim 2, wherein at least one of said first and second surface portions has a length extending from 5% to 45% of a total circumferential length of said first channel.

5. The coupling according to claim 1, wherein said seal comprises a flexible, resilient sealing ring having first and second ring inner surfaces adapted to respectively engage outer surfaces of said tube and said pipe element, one of said ring inner surfaces having a diameter sized to receive said pipe element upon insertion of said pipe elements between said segments.

6. The coupling according to claim 5, wherein said seal has an outer surface engaged with and supporting said segments in a preassembled state in spaced apart relation sufficient to allow said pipe element to be inserted into said central space.

7. The coupling according to claim 1, wherein said split ring has an outer radius of curvature and an inner radius of curvature, said inner radius of curvature being equal to or greater than an outer radius of said pipe element.

8. The coupling according to claim 1, wherein said split ring supports said segments in a preassembled state in spaced apart relation sufficient to allow said pipe elements to be inserted into said central space.

9. The coupling according to claim 8, wherein said split ring has sufficient stiffness to maintain said segments in said preassembled state through handling of said coupling during insertion of said pipe element.

10. The coupling according to claim 1, wherein said split ring comprises a plurality of teeth arranged in spaced relation to one another and extending circumferentially around said split ring, said teeth projecting toward said central space.

11. The coupling according to claim 1, wherein said plurality of segments comprises no more than two said segments.

12. The coupling according to claim 11, wherein each said segment comprises adjustable attachment members located at opposite ends thereof.

13. The coupling according to claim 12, wherein said adjustable attachment members comprise projections extending from opposite ends of each said segment, each said projection defining an opening for receiving a fastener.

14. The coupling according to claim 2, wherein at least one of said segments has at least one notch positioned in said two side surfaces adjacent to an end of said at least one segment.

15. The coupling according to claim 1, further comprising a second flange extending outwardly from said tube and positioned adjacent to said first flange.

16. The coupling according to claim 1, further comprising a barb extending outwardly from said tube proximate one end thereof.