CLAIMS

1. An underwater pipe assembly comprising:

a first pipe made of a plastic material, extending along a longitudinal axis, and having an inner circumferential surface surrounding the longitudinal axis, an outer circumferential surface opposite to said inner circumferential surface, and an annular end face between the inner and outer circumferential surfaces;

a second pipe made of a plastic material, abutting against said first pipe the longitudinal axis, and having an inner circumferential surface surrounding the longitudinal axis, an outer circumferential surface opposite to said inner circumferential surface of said second pipe, and an annular end face between said inner and outer circumferential surfaces of said second pipe, said annular end faces of said first and second pipes abutting against each other;

a coupling unit including an inner coil surrounding said inner circumferential surfaces of said first and second pipes at a junction therebetween, an annular inner cover layer covering said inner coil, an outer coil sleeved on said outer circumferential surfaces of said first and second pipes at a position corresponding to said inner coil, and an annular outer cover layer covering said outer

coil, each of said inner and outer coils having a first end portion located on one side of the junction of said first and second pipes, and a second end portion located on the other side of the junction of said first and second pipes and opposite to said first end portion; and

a clamping unit removably mounted on said first and second pipes at the junction therebetween, said clamping unit including a support member movably disposed inside said first and second pipes, an inflatable ring disposed between said support member and the junction between said first and second pipes, and a clamping member clamped around said annular outer cover layer, said support member including a support ring surrounding the longitudinal axis, a connecting ring disposed inside said support ring, a plurality of angularly spaced-apart spokes connected between said support ring and said connecting ring, a cross frame connected to said connecting ring, and a plurality of rollers mounted on said cross frame and rollable along said inner circumferential surfaces of said first and second pipes;

wherein, when said inner and outer coils are energized, said annular end faces of said first and second pipes are melted to fuse together said first and second pipes along the longitudinal axis, and

said annular inner and outer cover layers are melted to radially fuse with said first and second pipes.

2. The underwater pipe assembly as claimed in Claim 1, wherein said inner circumferential surface of said first pipe has a first annular recess extending inwardly and axially from said annular end face of said first pipe, said inner circumferential surface of said second pipe having a second annular recess extending inwardly and axially from said annular end face of said second pipe, said first and second annular recesses communicating with each other along the longitudinal axis and cooperatively forming an annular notch, said inner coil and said annular inner cover layer being disposed in said annular notch, said first end portion of said inner coil being located in said first annular recess, said second end portion of said inner coil being located in said second annular recess, said annular inner cover layer being flush with said inner circumferential surfaces of said first and second pipes.

3. The underwater pipe assembly as claimed in Claim 1, wherein a length of said annular outer cover layer along the longitudinal axis is greater than that of said annular inner cover layer along the longitudinal axis.

4. The underwater pipe assembly as claimed in Claim 1, wherein each of said first and second pipes is made of a polyethylene material, and each of said annular inner and outer cover layers is made of one of polyethylene and polypropylene materials.

5. A method for assembling underwater pipes, comprising the steps of:

(A) preparing a first pipe, a second pipe, a coupling unit and a clamping unit, each of the first and second pipes being made of a plastic material and extending along a longitudinal axis, each of the first and second pipes having an inner circumferential surface surrounding the longitudinal axis, an outer circumferential surface opposite to the inner circumferential surface, and an annular end face between the inner and outer circumferential surfaces, the coupling unit including inner and outer coils and annular inner and outer cover layers, the clamping unit including a support member, an inflatable ring and a clamping member, the support member including a support ring surrounding the longitudinal axis;

(B) abutting the annular end faces of the first and second pipes against each other, disposing the inner coil on the inner circumferential surfaces of

the first and second pipes at a junction therebetween, and covering the inner coil with the annular inner cover layer;

(C) sleeving the outer coil on the outer circumferential surfaces of the first and second pipes at a position corresponding to the inner coil, and covering the outer coil with the annular outer cover layer;

(C-1) disposing the support member inside the first and second pipes;

(C-2) sleeving the inflatable ring on the support ring of the support member;

(C-3) moving the support member and the inflatable ring to a position corresponding to the annular inner cover layer;

(C-4) clamping the clamping member around the annular outer cover layer;

(D) clamping tightly the first and second pipes and the coupling unit using the clamping unit;

(E) energizing the inner and outer coils so as to generate heat which melts the annular end faces of the first and second pipes to fuse together the first and second pipes along the longitudinal axis and which melts the annular inner and outer cover layers to radially fuse with the first and second pipes; and

(F) removing the clamping unit from the first and

second pipes.

6. The method as claimed in Claim 5, further comprising the step of inflating the inflatable ring after step (D) and before the step (E).

7. The method as claimed in Claim 5, wherein, in step (A), the inner circumferential surface of the first pipe has a first annular recess extending inwardly and axially from the annular end face of the first pipe, the inner circumferential surface of the second pipe having a second annular recess extending inwardly and axially from the annular end face of the second pipe, the first and second annular recesses communicating with each other along the longitudinal axis and cooperatively forming an annular notch, the inner coil and the annular inner cover layer being disposed in the annular notch.

8. The method as claimed in Claim 5, wherein, in step (A), each of the first and second pipes is made of a polyethylene material, and each of the annular inner and outer cover layers is made of one of polyethylene and polypropylene materials.

9. The method as claimed in Claim 5, wherein, in step (A), the support member further includes a

connecting ring disposed inside the support ring, a plurality of angularly spaced-apart spokes connected between the support ring and the connecting ring, a cross frame connected to the connecting ring, and a plurality of rollers mounted on the cross frame and rollable along the inner circumferential surfaces of the first and second pipes; and wherein, in step (C-3), the support member and the inflatable ring are moved using the rollers.