Claims

1. In combination, a sprinkler and a coupling in a pre-assembled state for joining said sprinkler to a pipe element, said coupling comprising:

first and second segments arranged end to end surrounding a central space, each of said segments having a first end and a second end;

an adjustable attachment assembly connecting said segments to one another at a separation sufficient to permit insertion of said pipe element into said central space;

first and second arcuate surfaces positioned on opposite sides of said segments and projecting toward an axis extending through said central space;

an annular seal located within said central space, said annular seal comprising first and second lobes positioned on opposite sides of said seal and extending toward said axis;

said sprinkler comprising:

a body located at least partially within said central space, said body comprising a bore surrounding said axis, said bore having an inlet and an outlet oppositely disposed;

a groove extending around said body and positioned between said inlet and said outlet, at least a portion of said first arcuate surfaces on one side of

said segments engaging said groove and retaining said sprinkler to said coupling in said pre-assembled state.

2. The combination according to claim 1, further comprising a hinge pivotably connecting said first ends of each of said segments to one another.

3. The combination according to claim 2, wherein said adjustable attachment assembly connects said second ends of each of said segments to one another at a separation angle sufficient to permit insertion of said pipe element into said central space.

4. The combination according to claim 1, wherein said annular seal has an outer surface sized to support said segments at said separation when said coupling is in said pre-assembled state.

5. The combination according to claim 1, wherein said seal is compressed between said segments at said separation.

6. The combination according to claim 1, wherein said first arcuate surfaces have a smaller radius of curvature than said second arcuate surfaces.

7. The combination according to claim 1, wherein said first arcuate surfaces have a radius of curvature equal to a radius of curvature of said second arcuate surfaces.

8. The combination according to claim 1, wherein at least one of said arcuate surfaces comprises at least one tooth projecting toward said axis.

9. The combination according to claim 1, further comprising at least one relief cutout in one of said arcuate surfaces, said at least one relief cutout positioned proximate to an end of one of said segments and facing said central space.

10. The combination according to claim 2, wherein said hinge comprises:

a stirrup extending from said first end of said first segment;

a tongue extending from said first end of said second segment, said tongue engaging said stirrup and pivotably attaching said first and second segments to one another.

11. The combination according to claim 1, wherein said attachment assembly comprises:

a first lug extending from said second end of said first segment;

a second lug extending from said second end of said second segment, said first and second lugs being in facing relation with one another;

a fastener extending between said first and second lugs for adjustably connecting said segments to one another.

12. The combination according to claim 1, further comprising a projection projecting outwardly from said body, said projection being positioned between said groove and said outlet.

13. The combination according to claim 12, wherein said projection comprises a ring extending around said body.

14. The combination according to claim 13, wherein a portion of said body comprises a cylindrical surface, said groove and said ring extending circumferentially around said surface.

15. The combination according to claim 1, further comprising:

a first arm extending from said body adjacent to said outlet, said first arm having an end positioned in spaced relation to said outlet;

a closing member sealingly engaging said outlet;

a trigger positioned between said end of said first arm and said closing member, said trigger permitting opening of said closing member.

16. The combination according to claim 15, further comprising:

a second arm extending from said body adjacent to said outlet, said first and second arms meeting to form an apex in spaced relation to said outlet;

said trigger being positioned between said apex and said closing member, said trigger being heat sensitive and permitting opening of said closing member in response to a specified temperature.

17. The combination according to claim 16, wherein said trigger comprises a frangible bulb.

18. The combination according to claim 16, wherein said trigger comprises a solder link.

19. A method of preparing a combination according to claim 1 in a pre-assembled state; said method comprising:

attaching said first ends of said first and second segments to one another;

positioning said annular seal between said first and second segments;

inserting said body into engagement with said first lobe;

attaching said second ends of said segments to one another; and

positioning said segments at said separation.

20. The method according to claim 19, further comprising:

using a hinge to attach said first ends of said first and second segments; and

positioning said segments at a separation angle.

21. The method according to claim 19, further comprising compressing said annular seal between said segments.

22. A method of using the combination according to claim 1, the method comprising:

inserting said pipe element into said central space opposite to said body;

engaging said pipe element with said second lobe;

adjustably tightening said attachment assembly, thereby drawing said segments toward one another and engaging said first arcuate surfaces with said body and said second arcuate surfaces with said pipe element.

23. The method according to claim 21, further comprising engaging said second arcuate surfaces with a circumferential groove on said pipe element.

24. In combination, a sprinkler and a coupling in a pre-assembled state for joining said sprinkler to a pipe element, said coupling comprising:

first and second segments arranged end to end surrounding a central space, each of said segments having a first end and a second end;

an adjustable attachment assembly connecting said second ends of each of said segments to one another at a separation sufficient to permit insertion of said pipe element into said central space;

first and second arcuate surfaces positioned on opposite sides of said segments and projecting toward an axis extending through said central space;

an annular seal located within said central space, said annular seal comprising first and second lobes positioned on opposite sides of said seal and extending toward said axis;

said sprinkler comprising:

a body located at least partially within said central space, said body comprising a bore surrounding said axis, said bore having an inlet and an outlet oppositely disposed, said lobe engaging and retaining said body within said central space in said pre-assembled state; wherein

said separation is sufficient to permit insertion of said pipe element into said central space.

25. The combination according to claim 24, further comprising a hinge pivotably connecting said first ends of each of said segments to one another.

26. The combination according to claim 25, wherein said adjustable attachment assembly connects said second ends of each of said segments to one another at a separation angle sufficient to permit insertion of said pipe element into said central space.

27. The combination according to claim 24, wherein said annular seal has an outer surface sized to support said segments at said separation when said coupling is in said pre-assembled state.

28. The combination according to claim 27, wherein said seal is compressed between said segments at said separation.

29. The combination according to claim 24, wherein said first arcuate surfaces have a smaller radius of curvature than said second arcuate surfaces.

30. The combination according to claim 24, wherein said first arcuate surfaces have a radius of curvature equal to a radius of curvature of said second arcuate surfaces.

31. The combination according to claim 24, wherein at least one of said arcuate surfaces comprises at least one tooth projecting toward said axis.

32. The combination according to claim 24, further comprising at least one relief cutout in one of said arcuate surfaces, said at least one relief cutout positioned proximate to an end of one of said segments and facing said central space.

33. The combination according to claim 25, wherein said hinge comprises:

a stirrup extending from said first end of said first segment;

a tongue extending from said first end of said second segment, said tongue engaging said stirrup and pivotably attaching said first and second segments to one another.

34. The combination according to claim 24, wherein said attachment assembly comprises:

a first lug extending from said second end of said first segment;

a second lug extending from said second end of said second segment, said first and second lugs being in facing relation with one another;

a fastener extending between said first and second lugs for adjustably connecting said segments to one another.

35. The combination according to claim 24, further comprising a groove extending around said body and positioned between said inlet and said outlet, said first arcuate surfaces being engageable with said groove.

36. The combination according to claim 24, further comprising a projection projecting outwardly from said body, said projection being positioned between said groove and said outlet.

37. The combination according to claim 36, wherein said projection comprises a ring extending around said body.

38. The combination according to claim 37, wherein a portion of said body comprises a cylindrical surface, said groove and said ring extending circumferentially around said surface.

39. The combination according to claim 24, further comprising:

a first arm extending from said body adjacent to said outlet, said first arm having an end positioned in spaced relation to said outlet;

a closing member sealingly engaging said outlet;

a trigger positioned between said end of said first arm and said closing member, said trigger permitting opening of said closing member.

40. The combination according to claim 39, further comprising:

a second arm extending from said body adjacent to said outlet, said first and second arms meeting to form an apex in spaced relation to said outlet;

said trigger being positioned between said apex and said closing member, said trigger being heat sensitive and permitting opening of said closing member in response to a specified temperature.

41. The combination according to claim 40, wherein said trigger comprises a frangible bulb.

42. The combination according to claim 40, wherein said trigger comprises a solder link.

43. A method of preparing a combination according to claim 24 in a pre-assembled state; said method comprising:

attaching said first ends of said first and second segments to one another;

positioning said annular seal between said first and second segments;

inserting said body into engagement with said first lobe;

attaching said second ends of said segments to one another; and

positioning said segments at said separation.

44. The method according to claim 43, further comprising:

using a hinge to attach said first ends of said first and second segments; and

positioning said segments at a separation angle.

45. The method according to claim 43, further comprising compressing said annular seal between said segments.

46. A method of using the combination according to claim 24, the method comprising:

inserting said pipe element into said central space opposite to said body;

adjustably tightening said attachment assembly, thereby drawing said segments toward one another and engaging said first arcuate surfaces with said body and said second arcuate surfaces with said pipe element.

47. The method according to claim 46, further comprising engaging said second arcuate surfaces with a circumferential groove on said pipe element.