A mounting apparatus for mounting a lighting fixture to a pole including a pole plate, a first mounting bracket mounted on the pole, a second mounting bracket adapted to be removably mounted to the first mounting bracket, and an extrusion adapted to be mounted to the second mounting bracket. The extrusion also adapted to have the light source mounted to it.
MOUNTING APPARATUS FOR AREA LIGHTING FIXTURES

BACKGROUND OF THE INVENTION

[0001] This invention relates to the illumination arts and, more particularly, to mounting devices for mounting a lighting fixture to a pole. More specifically, the invention relates to mounting devices for quickly mounting and removing a lighting fixture from a pole and, in some instances, simultaneously establishing electrical connection via the mounting arrangement when the fixture is properly mounted to the pole.

[0002] Currently, mounting decorative area lighting products on a pole to illuminate a parking lot, street, or similar area involves using an extrusion or mounting component, at least a pair of threaded rods, and a threaded pole plate. The rods are passed through a pair of openings formed in an upper portion of the pole and threaded into a pole plate. The extrusion is placed over the protruding rods, then the lighting fixture is mounted on the extrusion/rod assembly and two nuts secure the housing to the extrusion/rod assembly. The method is time consuming, difficult to handle because of all the loose components, and does not provide an electrical connection.

[0003] Therefore, it is desirable to provide a luminaire that can quickly mount to and quickly release from a pole. Furthermore, it would be beneficial to simultaneously establish complete electrical connections with the fixture to input power without manipulating the mounting components during mounting and without requiring separate electrical components and undertaking separate electrical connection steps.

BRIEF SUMMARY OF THE INVENTION

[0004] In an exemplary embodiment of the present invention, a mounting apparatus includes a first mounting element that mounts to the pole and a second mounting element that receives the lighting fixture at one end and attaches to the first mounting element at the other end. The first mounting element includes a base member having first and second appendages extending therefrom. The second mounting element includes first and second arms extending from a central member that are adapted to mattingly engage with the appendages of the first mounting element.

[0005] The mounting apparatus also preferably includes electrical connectors attached to the mounting brackets to provide an electrical connection for the lighting fixture.

[0006] Additionally, the mounting apparatus includes openings in the respective mounting elements. The openings receive fasteners to attach an arm having a lighting fixture secured at one end to one of the mounting elements. The other mounting element includes openings to receive fasteners that attach the other mounting element to the utility pole.

[0007] An exemplary method of mounting a lighting fixture to a pole is provided. The method includes the steps of connecting the fixture to a first end of a fixture mounting component or extrusion, fastening a second end of the fixture mounting component to a first mounting bracket, mounting a second mounting bracket to the pole, and sliding the first mounting bracket into the second mounting bracket.

[0008] The method preferably further includes the step of providing an electrical connector on each of the mounting brackets and engaging the two electrical connectors to provide an electrical connection.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] FIG. 1 is an exploded view of a mounting apparatus according to the present invention.

[0010] FIG. 2 is a top view of a mounting apparatus without a cap plate according to the present invention.

[0011] FIG. 3 is a perspective view of the mounting apparatus of FIG. 2 showing electrical connectors in phantom.

DETAILED DESCRIPTION OF THE INVENTION

[0012] With reference to FIG. 1, a light fixture mounting assembly or apparatus 10 generally includes a pole mounting component or pole plate 20, a first mounting bracket 24, a second mounting bracket 26, and a light fixture mounting component or extrusion 28. The pole plate 20 is rectangular in shape in the exemplary embodiment having first and second openings or fastener receiving holes 30, 32. The plate is dimensioned for receipt inside a utility pole 34 to which the lighting fixture (not shown) is mounted. The plate in the preferred embodiment is made from metal, however, it will be appreciated that the plate can be formed from any suitable material that would be of sufficient strength and rigidity to adequately anchor the first mounting bracket to the pole. The pole likewise includes openings or fastener receiving holes 36, 38 that are similarly dimensioned apart from mating alignment with the plate holes 30, 32.

[0013] The first mounting bracket of the exemplary embodiment includes a central portion 42, a first sidewall, flange, or appendage 44 preferably extending from adjacent one edge of the central portion, and a second sidewall, flange, or appendage 46 also preferably extending from adjacent the other edge of the central portion. The sidewalls extend perpendicularly from outer edges of the central portion or may be located inwardly from the edges if so desired. As best seen in FIG. 2, the sidewalls form a receiving cavity of a dovetail connection. The first appendage 44, the second appendage 46 and an inner surface 40 of the central portion 42 define a channel 48 into which a portion of the second mounting bracket 26 is received. Referring again to FIG. 1, the central portion 42 of the first mounting bracket also includes first and second openings or mounting holes 50, 52. The first mounting bracket openings 50, 52 also align with the openings 36, 38 in the pole and the pair of openings 30, 32 in the pole plate. Fasteners such as threaded mounting bolts 80, 82 extend through aligned openings to securely attach the first mounting bracket 40 to the pole.

[0014] As more particularly illustrated in FIG. 2 the central portion 42 of the first mounting bracket has a mounting surface 54 facing the pole. The mounting surface 54 preferably has an arcuate contour or surface shape substantially matching the contour of the pole 34 so that when the first mounting bracket is mounted thereto, the mounting bracket snugly engages the pole.

[0015] An electrical connector 56 is preferably mounted in integral fashion to the central portion 42 on the inner surface.
of the mounting bracket which faces away from the pole. The electrical connector provides one portion of an electrical connection between an electrical input and the light source of the lighting fixture.

[0016] As is evident from FIG. 2, a portion of the first mounting bracket 24 forms a receiving end of a dovetail type connection. The first sidewall 44 has an outer surface 58 that is substantially perpendicular to the inner surface 40 of the central portion 42. The second sidewall 46 is in a spaced relation to the first sidewall 44 and also has an outer surface 60 that is substantially perpendicular to the inner surface 40 of the central portion 42. The first sidewall has an interior contact surface 62 that extends outwardly from the inner surface 40 and preferably at an acute angle. Likewise, the second sidewall 46 has an interior contact surface 64 that faces contact surface 62 and extends outwardly from the inner surface 40 and preferably at an acute angle. The contact surfaces 62, 64 and the inner surface 40 define the channel 48 that receives a portion of the second mounting bracket member 26. The remainder of the dovetail connection will be explained in more detail below.

[0017] The second mounting bracket 26 includes a first member or leg 66 and a second member or leg 68 extending outwardly from a base or central portion 70. The first and second legs 66, 68 are adapted to slidably engage the first and second sidewall 44, 46 of the first mounting bracket, respectively. The first leg 66 has an outer or external contact surface 72 that faces and engages the first sidewall contact surface 62 when the second mounting bracket slides into the channel 48. The second leg 68 also has a contact surface 74 that faces and slidably engages with the second sidewall contact surface 64 when the second mounting bracket slides into the channel 48 of the first mounting bracket.

[0018] To complete the dove-tail type connection, the contact surfaces 72, 74 of the first and second legs 66, 68 of the second mounting bracket form an acute angle with an inner surface 76 of the second mounting bracket base. To provide a snug fit, the acute angle is substantially equal to the acute angle of the contact surfaces 62, 64 of the first and second sidewalls 44, 46 of the first mounting bracket 24.

[0019] The second mounting bracket 26 also includes an electrical connector 78 integrally attached to the second mounting bracket inner surface 76. The electrical connector is preferably disposed between the first and second legs 66, 68. When the second mounting bracket is mounted onto the first mounting bracket 24, the electrical connector 78 of the second mounting bracket 26 matingly engages with the electrical connector 56 of the first mounting bracket 24.

[0020] As shown in FIG. 1, the second mounting bracket also preferably openings 80, 82 that are dimensioned and spaced to receive threaded rods 96, 98. The second mounting bracket also includes a cap plate 84 that is either integrally formed or attached at a first or upper end of the second mounting bracket. The cap plate provides a cap or lid on top of the mounting brackets when the second mounting bracket is mounted onto the first mounting bracket. The cap plate preferably has a contoured edge 86 facing the pole 34 that matches the contour of the arcuate mounting surface of the first mounting bracket.

[0021] The assembly also includes the mounting arm or extrusion member 28 for receiving the light fixture. The extrusion member in the exemplary embodiment is substantially hollow, however other cross-sectional configurations could be used with equal success and without departing from the scope and intent of the present invention. The extrusion includes an inner wall 90 having cylindrical members 92 and 94 formed therein. The cylindrical members 92, 94 align with the openings 80, 82 of the second mounting bracket 26 such that threaded rods 96, 98 or another type of fastener extend through the cylindrical members to engage openings 80, 82 in the second mounting bracket and thereby attach the extrusion to the second mounting bracket. The extrusion may alternatively be fastened to the second mounting bracket by other means if so desired.

[0022] As best seen in FIG. 3, the electrical connectors 56, 78 are a common male and female type connection. The electrical connector 78 is integrally secured to the second mounting bracket 26 is the male connector having blades 100. The blades 100 fit into receptacles 102 of the female connector 56 attached to the first mounting bracket. The orientation of the blades 100 and receptacles 102 can be modified as can the location of the male and female connectors. Also, other types of electrical connection can be used to electrically connect the lighting fixture to wiring in the pole 34.

[0023] The lighting fixture is preferably attached to the pole 34 by initially attaching the first mounting bracket 24 to pole via mounting bolts 104, 106 extending through first mounting bracket openings 50, 52, and through the pole openings 36, 38. The plate 20 is located inside the pole 34 and the bolts 104, 106 threaded into plate openings 30, 32. The extrusion 28 or receiving arm, which has the light fixture attached at one end, connects to the second mounting bracket 26 by placing threaded rods 96, 98 through cylindrical members 92, 94 and threading the rods inside second mounting bracket openings 80, 82. Attaching the extrusion 28 and the lighting fixture to the second mounting bracket 26 may be accomplished in the factory as opposed to in the field as required by the prior art. Mounting the first mounting bracket 24 to the pole 34 is done in the field.

[0024] To mount the fixture and receiving arm assembly to the pole 34, the second mounting bracket 26, and particularly the legs 66, 68 are slid into channel 48 of the first mounting bracket 24. The contact surfaces 72, 74 of the first and second members 66, 68 slide across the contact surfaces 62, 64 of the first and second sidewalls 44, 46. The electrical connector 78 of the second mounting bracket 26 then matingly engages with electrical connector 56 of the first mounting bracket 24 to provide an electrical connection between the two. Thus, a simple and less cumbersome way of mounting a lighting fixture to a pole has been described.

[0025] The invention has been described with reference to the preferred embodiment. Obviously, modifications and alterations will occur to others upon reading and understanding the preceding detailed description. For example, although FIG. 1 illustrates a single end cap 84 for closing the upper end of the mating channels of the first and second mounting brackets, it will be appreciated that the opposite or lower end of the assembly could be closed with a similar end cap if so desired. This would also provide additional structural support to the arrangement. In addition, the contact surfaces of the first and second members and the sidewalls are described as forming a dovetail configuration along their
length. It will be appreciated that if these components are not extruded, and are formed in an alternative manner such as a casting, then consideration could be given to narrowing the dimension between the mating contact surfaces over the length thereof so that the forces/weight of the light fixture carried by the receiving arm can be distributed over the height of the first and second mounting components rather than being limited to the end caps. It is intended that the invention be construed as including all such modifications and alterations in so far as they come within the scope of the appended claims or the equivalents thereof.

What is claimed is:

1. A mounting apparatus for attaching a lighting fixture to an associated pole comprising:
   a first mounting element adapted to attach to the pole, the first mounting element comprising a central portion having first and second sidewalls extending from an inner surface of the central portion; and
   a second mounting element adapted to matingly engage the first mounting element, the second mounting element comprising a central member having first and second arms extending from an inner surface of the central member.

2. A mounting apparatus of claim 1 further comprising:
   a first electrical connector mounted to the inner surface of the central portion of the first mounting element interposed between the first and second sidewalls; and
   a second electrical connector mounted to the inner surface of the central member of the second mounting element interposed between the first and second arms.

3. A mounting apparatus of claim 1 wherein the central member of the second mounting element defines at least two holes adapted to receive fasteners to attach the lighting fixture to the second mounting element.

4. A mounting apparatus of claim 1 wherein the second mounting element arms each have inner surfaces facing each other that are substantially perpendicular to the central member inner surface and contact surfaces opposite the inner surfaces that form an acute angle with the central member inner surface.

5. A mounting apparatus of claim 1 wherein the first mounting element sidewalls each have a contact surface facing each other that form an acute angle with the central portion inner surface and an outer surface opposite the contact surface that are substantially perpendicular to the inner surface of the central portion inner surface.

6. A mounting apparatus of claim 1 wherein the central portion of the first mounting member includes a mounting surface having an arcsine shape opposite the inner surface.

7. A mounting apparatus of claim 1 wherein the central portion of the first mounting member defines at least two openings adapted to receive fasteners to attach the first mounting element to the pole.

8. A mounting apparatus for attaching a lighting fixture to an associated plate disposed inside an associated utility pole, the apparatus comprising:
   a first mounting bracket adapted to attach to the plate inside the pole, the first mounting bracket comprising a central portion, a first sidewall and a second sidewall both extending from the central portion, the central portion having a mounting surface adapted to match the pole and an inner surface wherein the first and second sidewalls and the inner surface define a channel;
   a second mounting bracket comprising a central member, a first arm and a second arm both extending from the central member and both adapted to be received by the first mounting bracket channel;
   a first electrical connector mounted on the central portion disposed in the channel of the first mounting bracket; and
   a second electrical connector mounted on the central portion of the second mounting bracket adapted to matingly engage with the first electrical connector.

9. A mounting apparatus of claim 8 further comprising a receiving arm having one end adapted to mount to the second mounting bracket and another end adapted to receive a mating mounting bracket.

10. A mounting apparatus of claim 9 wherein the receiving arm comprises an inner wall having at least one cylindrical element disposed on the inner wall.

11. A mounting apparatus of claim 8 wherein the central portion of the first mounting bracket defines at least two openings adapted to receive fasteners to fasten the first mounting bracket to the plate.

12. A mounting apparatus of claim 8 wherein the mounting surface is arcuate.

13. A mounting apparatus of claim 8 wherein the second mounting bracket includes a cap attached at an end.

14. A mounting apparatus of claim 13 wherein the cap includes an edge matching the contour of the mounting surface.

15. A mounting apparatus of claim 8 wherein the first electrical connector is a male adapter adapted to fit into the second electrical connector.

16. A method of mounting a lighting fixture to a pole, the method comprising:
   mounting a first mounting bracket to the pole;
   connecting the fixture to a first end of an extrusion;
   fastening a second end of the extrusion to a second mounting bracket;
   slidably engaging the second mounting bracket with the first mounting bracket.

17. A method of claim 16 further comprising:
   providing an electrical connector on the first mounting bracket;
   providing an electrical connector on the second mounting bracket; and
   matingly engaging the first mounting bracket electrical connector with the second mounting bracket electrical connector.