Sept. 4, 1962 E. G. GAYNOR 3,052,864

FLUORESCENT LAMP HOLDER

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FIG. 1

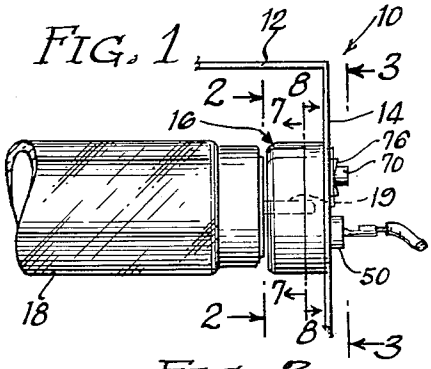


FIG. 2

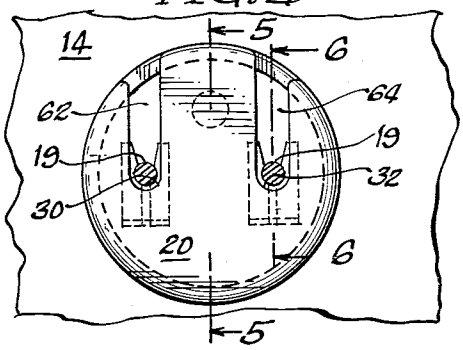


FIG. 3

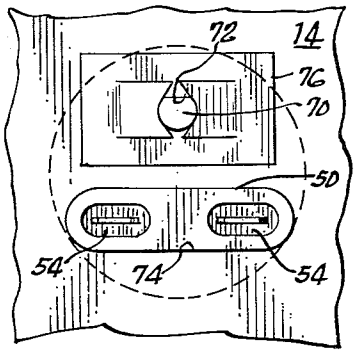


FIG. 4

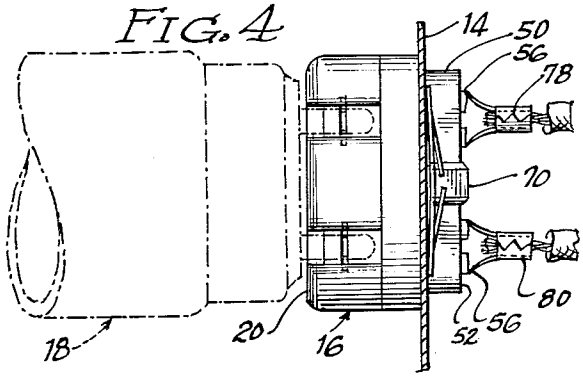


FIG. 5

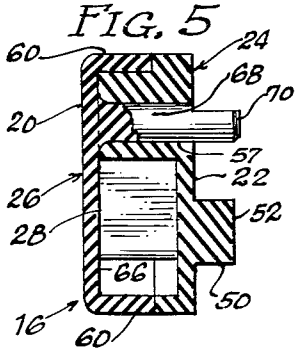


FIG. 6

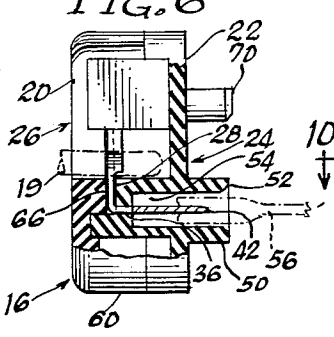


FIG. 7

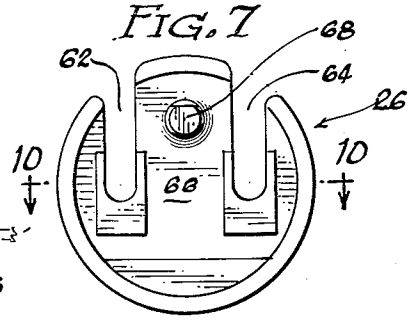


FIG. 8

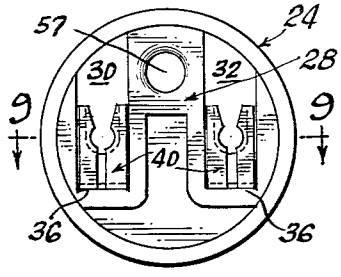


FIG. 9

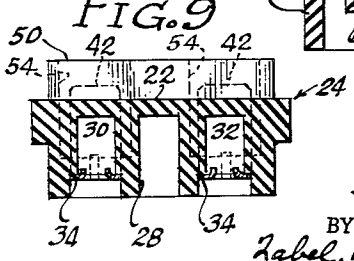
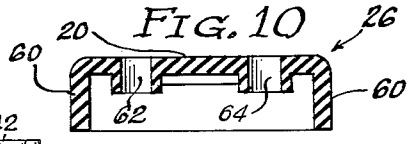


FIG. 10



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FIG. 11

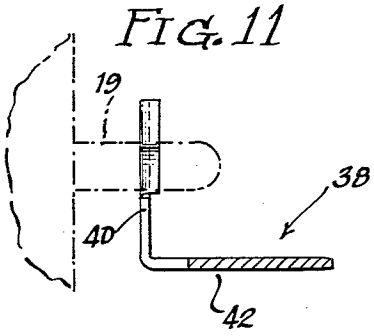


FIG. 12

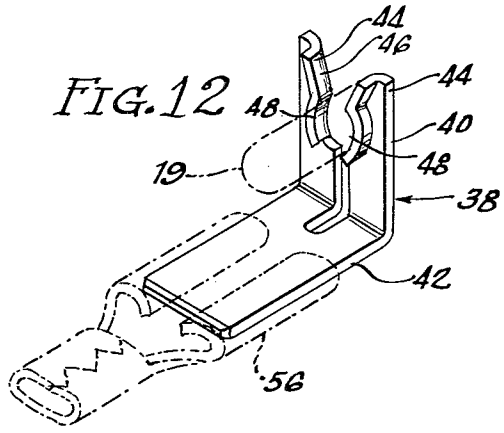


FIG. 13

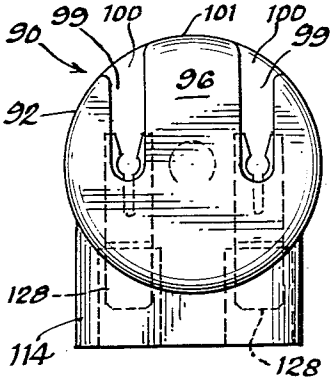


FIG. 14

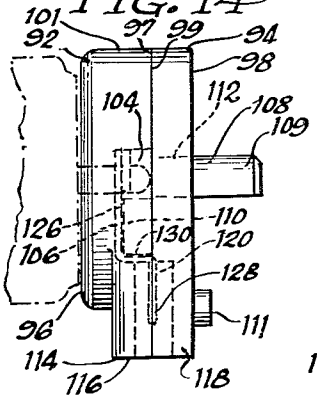


FIG. 15

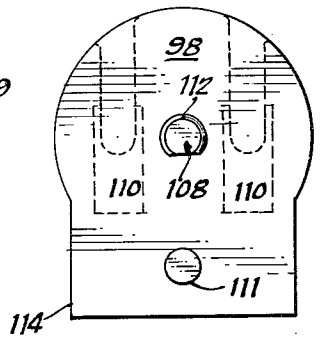


FIG. 16

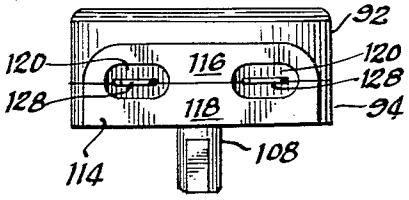
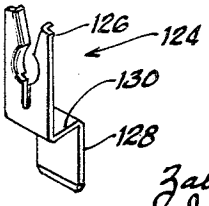


FIG. 17



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FLUORESCENT LAMP HOLDER

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2 Claims. (Cl. 339—53)

This invention relates to a fluorescent lamp holder and to means for mounting the holder on a fixture.

Competition in the manufacture of both fluorescent lamp holders and fixtures is keen, and anything which can reduce costs is valuable. A substantial part of the cost of fixtures goes into the cost of making the fluorescent lamp holder and into the cost of the labor required to mount the holder on the fixture. What is needed therefore, and comprises the principal object of this invention is to devise ways of reducing these costs.

Conventional fluorescent lamp holders comprise a molded plastic shell. The comparatively large elongated terminals for connection with the pins of a fluorescent lamp are positioned in terminal receiving portions of the shell and are held in place by means of a closure member. This closure member is formed from an insulating paper-like material which is fastened to the shell by means of screws or the like. A portion of the terminals is provided with threaded openings which receive screws so that power wires can be connected to them.

The entire assembled lamp holder is mounted on the fixture by means of another screw which is designed to penetrate an opening in the fixture and a threaded opening or nut on the body of the shell. It is apparent from this that, even after the shell is formed, a comparatively large investment in metal, tools, and assembly time is necessary, first to complete and assemble the holder and then to mount it on the body of the fixture.

In addition to these considerations, existing fluorescent lamp holders must be mounted on a support which is parallel to the axis of the fluorescent lamp. This is often inconvenient, when the available support surface is perpendicular to the lamp, such as when the lamp is to be horizontally mounted and is to be plugged directly into an opening in a wall, because, in such a case, it would be necessary to go to the trouble and expense of providing a separate horizontal support member which is attached to the wall and to which the lamp holders may be secured.

What is needed therefore and comprises an important object of this invention is a holder for fluorescent lamps which can be completely and easily assembled from its component parts without the use of any tools.

A further object of this invention is to provide a fluorescent lamp holder having electric terminals which are easy to fabricate and install in the body of the holder, and which uses substantially less metal than terminals in existing holders.

Another object of this invention is to provide a terminal for fluorescent lamp holder which has means on one end for receiving and gripping a pin on an elecronic device while the other end is shaped to extend inside a quick connect female terminal.

Still another object of this invention is to provide a lamp holder and a fixture which can be quickly, easily and removably fastened together without the use of any tools.

Yet a further object of this invention is to provide a fluorescent lamp holder which is mounted on a supporting surface and which is provided with means for gripping the pins of a fluorescent lamp and holding them so they are perpendicular to the holder supporting surface.

These and other objects of the invention will become

more apparent when read in the light of the accompanying drawings wherein:

FIG. 1 is a side elevational view of the end portion of a fluorescent lamp shown plugged into a holder constructed according to one embodiment of this invention and which is shown mounted on the supporting surface of a fixture.

FIG. 2 is an enlarged sectional view on line **2—2** of FIG. 1.

FIG. 3 is a sectional view on line **3—3** of FIG. 1.

FIG. 4 is a top view of the fluorescent lamp holder and supporting surface shown in FIGS. 1–3.

FIG. 5 is a sectional view on line **5—5** of FIG. 2 with the supporting portion omitted.

FIG. 6 is a partial sectional view on line **6—6** of FIG. 2 with the supporting portion omitted.

FIG. 7 is a sectional view on line **7—7** of FIG. 1 with the lamp omitted.

FIG. 8 is a sectional view on line **8—8** of FIG. 1 with the supporting portion omitted.

FIG. 9 is a sectional view on line **9—9** of FIG. 8.

FIG. 10 is a sectional view on line **10—10** of FIG. 7.

FIG. 11 is a side elevational view partly in section showing one terminal constructed according to one embodiment of this invention and connected to a pin on a fluorescent lamp.

FIG. 12 is a perspective view of a terminal for the holder constructed according to the embodiment of FIGS. 1 and 11 and showing in dotted lines a quick connect female coupling connected to it at one end and the pin of a fluorescent tube connected to it at the other end.

FIG. 13 is a front elevational view of another embodiment of a fluorescent lamp holder constructed according to the principles of this invention.

FIG. 14 is a side elevational view of the fluorescent lamp holder shown in FIG. 13, with the end portion of a fluorescent tube in dotted lines.

FIG. 15 is a rear elevational view of the embodiment of the fluorescent lamp holder shown in FIG. 13.

FIG. 16 is a bottom view of the fluorescent lamp holder constructed according to the embodiment of FIG. 13.

FIG. 17 is a perspective view of the terminal for the holder of FIG. 13.

Referring now to FIG. 1, a fixture for fluorescent lamps indicated generally by the reference numeral **10** comprises the usual reflecting surface **12** and holder support portion **14**. A holder indicated generally by the reference numeral **16** for fluorescent lamp **18** is mounted on support portion **14** in a manner to be described below.

As seen in FIGS. 5 and 6, holder **16** has opposed parallel planar surfaces **20** and **22**, and in this particular embodiment, the holder comprises a molded plastic base member indicated generally by the reference numeral **24** and a molded plastic cover indicated generally by the reference numeral **26**, see FIGS. 7 and 8. As seen, base member **24** and cover **26** are circular in cross section, but this is not essential and other cross sectional shapes are contemplated and can be used.

Base member **24** has opposed surfaces **22** and **28**, see FIGS. 5 and 6. Spaced parallel grooves **30** and **32** (FIG. 8) are formed on surface **28** and in this embodiment both of these grooves intersect the periphery of the base member to permit the entrance of terminal pins **19** extending from a fluorescent lamp **18**, as described below. This arrangement is attractive and compact, but it is not essential, and other arrangements are possible and are contemplated. For example, the holder could have a single narrow pin receiving groove which communicates with the periphery of the holder at one end while the other end communicates with an enlarged opening. The entrance to the spaced parallel grooves could communicate with another edge of this enlarged opening,

so that the fluorescent lamp pins could be inserted through the narrow groove or passage endwise, and when they move into the enlarged opening the tube could be rotated on its axes until the pins can enter the spaced parallel grooves.

The sides of grooves **30** and **32** are enlarged adjacent surface **28** to provide seats **34** for terminals **38**, as described below, see FIG. 9. Terminal receiving openings **36** are formed in base member **24** which extend between opposed surfaces **22** and **28**, substantially transverse thereto, see FIG. 6, but it is evident that other angular relationships between the surfaces and the openings are possible. The entrance to these openings in surface **28** are in spaced relation to and in alignment with grooves **30** and **32**, see FIG. 8.

Terminals **38** in this embodiment are formed as by stamping from an elongated piece of electrically conductive metal. Each terminal is L-shaped in longitudinal cross section forming end portions **40** and **42**, see FIGS. 11 and 12. These terminals are mounted on base member **24** with end portions **40** in alignment with grooves **30** and **32** and in engagement with seats **34**, and with end portions **42** extending inside the terminal receiving openings **36**, see FIG. 6. As seen in FIG. 8, the width of terminal receiving openings **36** is substantially equal to the width of the terminals **38**, and consequently functions as a terminal positioning structure, so that the terminals **38**, can be easily and accurately mounted on abse member **24** by simply inserting end portions **42** of terminals **38** in openings **36** until end portions **40** engage seats **34**.

As seen in FIG. 12, end portion **40** of terminal **38** is split longitudinally defining a pair of tapered gripping jaws **44**. The facing edges **46** of the gripping jaws are recessed to provide complementary seat portions **48** for the pins **19** on a fluorescent lamp. These seat portions in free position are spaced apart a distance less than the thickness or diameter of fluorescent lamp pins **19** so that the stress produced in the terminal by forcing the pin of the fluorescent lamp inwardly between the gripping jaws and into the seat portions of the terminal is sufficient to cause the jaws to grip the terminal pin and provide an electrically conductive connection with it. End portion **42** of terminal **38** is unsplit, planar, thin, and elongated so that it can be received within a resilient quick connect female clip.

With this arrangement, it is evident that the grooves **30** and **32** of base member **24** act to receive and guide pins **19** of a fluorescent lamp into engagement with jaws **44** of a terminal **38**.

Surface **22** of base member **24** is provided with an outwardly projecting and transverse elongated boss **50**, see FIG. 6. The outer end **52** of boss **50** is provided with spaced parallel openings **54** which extend inwardly toward surface **28**, see FIGS. 3 and 6. The end of each opening **54** remote from outer end **52** of the boss communicates with a terminal receiving opening **36**, so that when terminals **38** are mounted on base member **24**, end portions **42** extend inside openings **54**, see FIG. 6. As seen, the height of openings **54** is substantially larger than the thickness of terminal end portion **42**. The reason is that the height and width of openings **54** are designed to slightly exceed corresponding dimensions of a quick connect female clip **56**, so that, as seen in FIGS. 4 and 6, the female clip can be snugly received in the openings **54** and move into mating contact with terminal end portion **42**, see FIG. 12. The length of boss **50** also serves to align the holder on its support portion **14** as described below. It is further noted that the end of terminal end portion **42** is inwardly spaced from end **52** of the boss to prevent damage to the tips of the terminals due to accidental blows. In addition to these features, base member **24** is provided with a post receiving opening **57** (FIG. 5) which in this particular embodiment happens to extend transversely between surfaces **22** and **28** for reasons to be described below.

Cover **26** includes peripheral flanges **60** which are adapted to embrace a substantial portion of the peripheral side surfaces of holder **24**, see FIG. 5. In addition, cover **26** has spaced parallel pin receiving slots **62** and **64** extending to its periphery, see FIG. 7. These slots are spaced so they are in coextensive alignment with grooves **30** and **32** on base member **24** when the cover is fixed thereon with flanges **60** embracing portions of the periphery of the holder **24**, as shown in FIGS. 2, 5 and 6. When cover **26** is applied, inner surface **66** of cover **26** engages surface **28** of base member **24** clamping terminal end portions **40** on seats **34** in grooves **30** and **32**, see FIG. 6.

A post **68** extends outwardly and transversely from surface **66** and is rigidly secured thereto. This post is sized to penetrate opening **57** in base member **24** when the cover is on the body. When so assembled, a portion **70** of post **68** projects outwardly beyond surface **22**, see FIGS. 5 and 6.

To assemble the holder without using any tools or other specialized equipment, it is only necessary to insert end portions **42** of terminals **38** in terminal receiving openings **36**, and then place cover **26** on base member **24** with post **68** extending through post receiving opening **57**. A slight force may be necessary because the diameter of the flanges **60** of the cover preferably is sized so that the fit between cover **26** and base member **24** is tight enough to prevent the cover from falling off the base member, but not too tight to prevent the parts from being easily separated.

Support portion **14** is provided with openings **72** and **74** which are similar in shape and size to post end portion **70** and boss **50**, see FIG. 3. To mount holder **16** on support portion **14**, it is only necessary to orient the holder so that end portion **70** of post **68** penetrates openings **72** and boss **50** penetrates opening **74**, see FIG. 4. This prevents the holder from rotating on the support member. A quick connect clip, such as a Tinnerman hold **76**, see FIG. 3, may be forced on the end of post **70** to quickly and easily lock holder **16** on support portion **14**. It is noted that this also simultaneously locks cover **26** to base member **24**.

As seen in FIG. 4, end **52** of boss **50** extends through the support **14**. With this arrangement, power leads **78** and **80**, which terminate in quick connect female clips **56**, can be inserted through openings **54** into removable mating connection with end portions **42** of terminals **40** in the holder, without the necessity of using any tools or removing the holder from the support.

In conventional fluorescent light fixtures, the holders are often designed so that the power leads come into the holder at right angels to the direction of projection of the pins on the fluorescent lamp, and structures are often wired with this in mind. In the modification shown in FIGS. 13–17, the holder is designed to take advantage of this arrangement so that it may be used in existing fixtures and structures without any wiring changes.

As seen in FIG. 13, a holder constructed according to the principles of this invention and indicated generally by the reference numeral **90** comprises a lamp engaging portion **92** and a support engaging portion **94**, see FIGS. 14 and 16. The lamp engaging portion has opposed parallel surfaces **96** and **97** and the support engaging portion has opposed parallel surfaces **98** and **99** so that the assembled holder has opposed parallel surfaces **96** and **98**, see FIG. 14.

Lamp engaging portion **92** has spaced parallel slots **100** which extend from peripheral surface **101** of portion **92** and communicate with the opposed parallel surfaces **96** and **97**, so that passages are provided which extend completely through the lamp engaging portion **92**. In addition, surface **97** of portion **92** is provided with grooves **104** which extend inwardly from surface **97** toward surface

96 and terminate in walls or seats 106, see FIG. 14. A post 108 extends outwardly from surface 97 for reasons to be described below.

Projecting members 110 are formed on surface 99 of the support engaging member 94. These projecting members have a periphery which is similar in shape to the periphery of a portion of the holder terminal described below. In addition, a post receiving opening 112 extends through portion 94 communicating with the opposed parallel surfaces 98 and 99, see FIGS. 14 and 15.

A boss 114 extends from a peripheral surface of the holder. As seen in FIG. 16, the boss is somewhat similar in shape to the boss 50 on the holder in the modification of FIG. 1. In this case, however, the boss is formed from radial portions 116 and 118 extending from portions 92 and 94. These radial portions are provided with complementary shaped recesses which when the holder portions 92 and 94 are secured together form enlarged openings 120, see FIG. 16. Openings 120 serve the same function as the openings 54 in the embodiment of FIG. 3, but they differ in that they extend in directions transverse to the direction of the fluorescent lamp pins in the holder.

Since the configuration of the holder shown in FIGS. 13–16 is different from the holder shown in FIG. 1, it is evident that changes are necessary in the shape of the holder terminals, indicated generally by the reference numeral 124, see FIG. 17. This modified terminal is provided with end portions 126 and 128 which are oppositely extending in spaced parallel relation. These end portions are joined by an intermediate and transverse connecting portion 130. As seen, end portions 126 and 128 are similar in shape and function to the end portions 40 and 42 in terminal 38.

To assemble the modified holder without using any tools, it is only necessary to position each terminal 124 so end portion 126 rests on seat 106 in holder portion 92, see FIG. 14. Then when post 108 of portion 92 is inserted in opening 112 of portion 94, and the portions 92 and 94 are forced together, projection 110 on surface 99 of portion 94 will move into engagement with portion 126 of the terminal 124, thus clamping portion 126 between seat 106 and projections 110. As seen, end portion 128 of terminal 124 extends into the opening 120.

End portion 109 of post 108 extends through portion 94 of the holder and beyond surface 98, see FIG. 14. This post portion along with post 111 extending from surface 98 is adapted to extend through correspondingly shaped openings in a support (not shown). This arrangement prevents the holder from rotating on the support and the holder can be conveniently secured to the support by means of a quick connect clip, such as a Tinnerman hold. It is noted again that this connection also simultaneously locks the holder portions 92 and 94 together when the holder is being mounted on a support.

It is evident that power leads terminating in female quick connect clips as shown in FIG. 4 conveniently and quickly connect to terminals 124 in this modification by inserting them into openings 120 in the same way as in the modification of FIG. 1.

The invention may be embodied in other forms without departing from the spirit or essential characteristics thereof as set forth in the claims, and the present embodiment is therefore to be considered as illustrative and not restrictive and it is intended to include all changes which come within the scope and range of the claims.

I claim:

1. A holder for fluorescent lamps comprising in combination a base member and a cover, said base member having opposed surfaces and a post receiving opening extending between them, one surface of said base member having spaced parallel grooves for providing terminal seats, and aligning means for orienting the holder with respect to a support, said aligning means including boss means extending from the surface of said base member opposite to the surface with said grooves, said boss means adapted to extend through at least one correspondingly shaped opening on a support for alignment of the base member thereon, said cover having parallel pin receiving slots formed therein, said slots spaced so they are in alignment with said grooves on said base member when the cover is fixed thereon whereby both the aligned grooves and slots are adapted to receive the pins on a fluorescent lamp for attachment of said pins to terminals mounted on said terminal seats, a post rigidly secured to said cover, said post adapted to extend completely through the post receiving opening in said base member when said cover is on said base member with a portion of said post extending beyond said opposite surface of said base member and adapted to extend through an opening in the support for engagement with a quick connect locking clip so that the cover is locked on said base member when the holder is attached to said support.

2. A holder for fluorescent lamps comprising in combination a base member and a cover, said base member having opposed surfaces with terminal receiving openings and a post receiving opening extending between them, one surface of said base member having spaced parallel grooves formed therein and providing terminal seats, the entrances to said terminal receiving openings in said one surface in communication with said grooves, boss means extending from the surface of said base member opposite to said grooves, said boss means adapted to extend through at least one opening on a support for alignment of the base member thereon, said terminal receiving openings extending through said boss means so that terminals in the holder may be connected to or disconnected from a source of electric power without removing the holder from the support, said cover having parallel pin receiving slots formed therein, said slots spaced so they are in alignment with said grooves on the base member when the cover is fixed thereon whereby the aligned grooves and slots are adapted to receive the pins of a fluorescent lamp for attachment of said pins to terminals on said terminal seats, a post rigidly secured to said cover, said post adapted to extend completely through the post receiving opening in said base member, a portion of said post extending beyond said opposite surface of said base member when said cover is on said base member, said portion of said post adapted to extend through an opening in the support for engagement with a quick connect locking clip so that the cover is attached to said base member when the holder is locked to said support.

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