(54) Title: APPARATUS FOR RETROFITTING AN ENCLOSURE WITH A CABINET

(57) Abstract: An apparatus for retrofitting an enclosure with a cabinet for digital service access equipment allows digital access equipment disposed in the cabinet to be accessible for coupling to other equipment disposed in the enclosure. The apparatus comprises a bracket, a wireway, and a fastener. The bracket is configured to attach to a substantially vertical surface of the enclosure. The attachment of the bracket to the enclosure provides a support for the cabinet. The wireway enables an interior of the enclosure to be coupled to an interior of the cabinet if the cabinet is attached to the bracket. The fastener attaches the cabinet to the bracket.
APPARATUS FOR RETROFITTING AN ENCLOSURE WITH A CABINET

Field of the Invention

The present invention relates to an apparatus for retrofitting an enclosure with a cabinet. More particularly, the present invention relates to an apparatus for retrofitting an enclosure with a cabinet such that digital access equipment disposed in the cabinet may be coupled to other equipment disposed in the enclosure.

Background of the Invention

Incumbent and competitive local exchange carriers that provide digital subscriber line (DSL) service have been fairly successful reaching their customer base that live within close proximity of a central office with high-speed data services. However, in many areas, the majority of the customers may not live near the central office. Typically, these customers receive their voice services via a digital loop carrier (DLC).

Most of the large regional bell operating companies (RBOCs) have begun providing DSL service to customers that do not live within close proximity to the central office. Remote digital services access multiplexer (DSLAM) cabinets are deployed near existing DLC cabinets or distribution area cross-connect enclosures. Deployment of DSLAM cabinets can be quite expensive due to permit and right-of-way issues, and construction costs associated with concrete pad placement and trenching. For most installations, the cost to the service provider can be $50,000 to $100,000 per site. This relatively high initial cost creates a lengthy period before a return on the investment can be realized.

The incumbent local exchange carrier's (ILEC) and RBOC's primary competitor is the cable television industry. In many regions, ILECs and RBOCs have started losing not only their data service customers but also their telephone service customers to this new competition. To compete with this well-positioned competitor, the ILECs and RBOCs compete on other levels such as video services. However, the
ILEC and RBOC networks were not originally designed to provide video services easily. Thus, an economical method of providing video service access platforms closer to the customers/subscribers is desired.

**Summary of the Invention**

This summary of the invention section is intended to introduce the reader to aspects of the invention. Particular aspects of the invention are pointed out in other sections herein below, and the invention is set forth in the appended claims, which alone demarcate its scope.

The present invention is directed to an apparatus for retrofitting an enclosure with a cabinet for digital service access equipment allows digital access equipment disposed in the cabinet to be accessible for coupling to other equipment disposed in the enclosure. The apparatus comprises a bracket, a wireway, and a fastener. The bracket is configured to attach to a substantially vertical surface of the enclosure. The attachment of the bracket to the enclosure provides a support for the cabinet. The wireway enables an interior of the enclosure to be coupled to an interior of the cabinet if the cabinet is attached to the bracket. The fastener attaches the cabinet to the bracket.

Another aspect of the present invention is directed to an apparatus for retrofitting an enclosure with a cabinet for digital service access equipment. The apparatus comprises a bracket, a wireway, and a fastener. The bracket is configured to attach to a substantially vertical surface located proximate to the enclosure. The attachment of the bracket to the substantially vertical surface provides a support for the cabinet. At least one of an input cable and an output cable extend through the wireway to enable coupling of the digital service access equipment disposed in the cabinet to other equipment disposed in the enclosure. The fastener attaches the cabinet to the bracket.
**Brief Description of the Drawings**

Non-limiting and non-exhaustive embodiments of the present invention are described with reference to the following drawings. In the drawings, like reference numerals refer to like parts throughout the various figures unless otherwise specified.

For a better understanding of the present invention, reference will be made to the following Detailed Description of the Invention, which is to be read in association with the accompanying drawings, wherein:

FIGURE 1 is a three dimensional perspective view of a cabinet attached to an enclosure;

FIGURE 2 is a three dimensional perspective view of the cabinet;
FIGURE 3 is a three dimensional perspective view of a bracket;
FIGURE 4 is a side view illustrating the cabinet, the enclosure, and the bracket before assembly is completed;

FIGURE 5 is a partial three dimensional perspective view of the cabinet, the enclosure, and the bracket illustrating a fastener that is arranged to attach the cabinet to the bracket; and

FIGURE 6 is a three dimensional perspective view of the cabinet attached to a modified housing of the enclosure, in accordance with aspects of the invention.

**Detailed Description of the Preferred Embodiment**

In the following detailed description of exemplary embodiments of the invention, reference is made to the accompanied drawings, which form a part hereof, and which is shown by way of illustration, specific exemplary embodiments of which the invention may be practiced. Each embodiment is described in sufficient detail to enable those skilled in the art to practice the invention, and it is to be understood that other embodiments may be utilized, and other changes may be made, without departing from the spirit or scope of the present invention. The following detailed description is, therefore, not to be taken in a limiting sense, and the scope of the present invention is defined only by the appended claims.
Briefly stated, the present invention is directed to an apparatus for retrofitting an enclosure with a cabinet such that digital access equipment disposed in the cabinet is accessible for coupling to other equipment disposed in the enclosure. The present invention enables a service provider to bring digital subscriber line (DSL) service to their subscribers that cannot be reached by central office based access equipment at a fraction of the cost and time normally associated with DSL deployment.

FIGURE 1 illustrates a three dimensional perspective view of a cabinet (100) attached to an enclosure (20) by a bracket (130). Enclosure 20 is mounted on a concrete pad (30). Enclosure 20 has an attachment surface (22). Bracket 130 is attached to attachment surface 22 of enclosure 20. Also, cabinet 100 is mounted on bracket 130 such that the cabinet is supported by concrete pad 30. Although not shown, the interior of cabinet 100 is typically arranged to accommodate the operation of equipment for digital access such as digital service line (DSL) equipment.

In another embodiment of the invention (not shown), bracket 130 can be attached to a substantially vertical surface such as a wall or pole located near enclosure 20. In this embodiment, cabinet 100 may be mounted on bracket 130 such that cabinet 100 is supported by the substantially vertical surface. For some installations, this arrangement of cabinet 100 and bracket 130 can reduce and in some cases eliminate the need for right-of-way and construction permits, require no additional concrete pad and reduce construction costs when compared to other methods of digital services equipment deployment.

FIGURE 2 illustrates a three-dimensional perspective view of cabinet 100. Digital access equipment can be disposed in cabinet 100 and can include a remote access module (114), a telephone service splitter (116), and a service protection center (118). Input and output cables (120) extend from cabinet 100 and these cables enable the digital access equipment to couple to other equipment disposed within enclosure 20. Cabinet 100 includes a mounting surface (122) (shown in FIGURE 4) and a roof (124) that can provide protection from the weather in outdoor locations.

FIGURE 3 illustrates a three-dimensional perspective view of bracket 130, which includes a base (140), a plate (150), and a fastening mechanism (160) for
attaching the plate to the base. As shown, the base is a U-shaped member having a main body (142), and a pair of parallel arms (144) extending perpendicularly and unidirectionally from opposite ends of the main body. Fastening mechanism 160 may be any means for attaching the plate to the base such as screws, bolts, welded joints, and the like.

In FIGURE 3, exemplary fastening mechanism 160 is represented by four bolts (162) and four nuts (not shown). Bolts 162 are inserted into corresponding holes formed in base 140 and plate 150 to engage with the threads of corresponding nuts. The plate is an elongate member having one end attached to the main body of base 140 by fastening mechanism 160 and an opposite free end such that the plate extends perpendicularly from the main body of base 140. In another embodiment of the invention, the base and the plate can be integrally formed such that the bracket does not require a fastening mechanism. Also, a slot (152) can be formed along an edge of the free end of plate 150. As shown, orifices (154) and slots (156) can be formed in a middle portion of plate 150.

Also referring to FIGURE 4, orifices 154 and slots 156 of plate 150 can be used as a template to mark hole and slot locations on attachment surface 22 of enclosure 20. Holes and slots (not shown) corresponding to orifices 154 and slots 156 of plate 150 can be formed in attachment surface 22 by means of a drill, hole saw, tool punch, and the like. The lining up of the holes formed in attachment surface 22 and orifices 154 create a port. The port can be used as a wireway that enables an interior of enclosure 20 to be coupled to an interior of cabinet 100 when the cabinet is attached to the bracket and disposed adjacent to enclosure 20.

Bracket 130 can be affixed to attachment surface 22 of enclosure 20 by a mounting mechanism. The mounting mechanism can be any means for affixing the bracket to the attachment surface such as screws, bolts, welded joints and the like. For example, the mounting mechanism can be represented by a bolt extending through each slot 156 of plate 150 and the corresponding slot in the attachment surface 22 to engage with the threads of a corresponding nut positioned within the enclosure.
Input and output cables 120 of cabinet 100 are passed through the wireway. Input and output cables 120 can be connected to equipment disposed in enclosure 20 such that digital access equipment disposed in the cabinet is coupled to equipment disposed in the enclosure. Cabinet 100 is typically positioned on the base of the bracket such that the mounting surface abuts plate 150.

As shown in FIGURE 5, an L-shaped tab (126) extends vertically and downwardly from the roof of cabinet 100 proximate to mounting surface 122. Tab 126 enables the selective engagement of slot 152 so that cabinet 100 can be coupled to bracket 130. Cabinet 100 is secured to bracket 130 by a securing mechanism (not shown). The securing mechanism can be any means for securing the cabinet to the bracket, such as screws, bolts, welded joints, and the like. For example, the securing mechanism can be represented by nuts engaging the threads of corresponding bolts to secure cabinet 100 to base 140. Further, bracket 130 enables the cabinet to be supported by the concrete pad.

In another embodiment, cabinet 100 is not attached to enclosure 20. For example, cabinet 100 could be attached to any substantially vertical surface such as a wall or pole located near the enclosure.

Referring to FIGURE 6, an enclosure may have a shape that prevents cabinet 100 from being easily attached thereto. However, this type of enclosure can be replaced with a modified housing (200). Modified housing 200 is shaped such that cabinet 100 can be attached to modified housing 200 as described above.

The apparatus for retrofitting an enclosure with a cabinet for digital access equipment simplifies and reduces the size and cost related to remote DSL deployment. Construction costs are avoided because the retrofitted cabinet does not require a new concrete pad for support. Installation time and cost are decreased because trenches between the cabinet and enclosure for burying the input and output cables are not required. Complications created by right-of-way issues do not arise when the cabinet is directly attached to the enclosure or to a modified enclosure that facilitates attachment of the cabinet.
The above specification, examples, and data provide a complete description of the manufacture and use of the composition of the invention. Since many embodiments of the invention can be made without departing from the spirit and scope of the invention, the invention resides in the claims hereinafter appended.
I CLAIM:

1. An apparatus for retrofitting an enclosure with a cabinet for digital service access equipment, comprising:
   a bracket that is configured to attach to a substantially vertical surface of the enclosure, wherein the attachment of the bracket to the enclosure provides a support for the cabinet;
   a wireway, wherein the wireway enables an interior of the enclosure to be coupled to an interior of the cabinet if the cabinet is attached to the bracket; and
   a fastener for attaching the cabinet to the bracket;
   wherein digital service access equipment that is disposed in the cabinet is accessible for coupling to other equipment disposed in the enclosure.

2. The apparatus of claim 1, wherein the wireway is formed by a port that extends from a substantially vertical surface of the cabinet disposed against a substantially vertical surface of the bracket through the substantially vertical surface of the enclosure that is attached to the bracket.

3. The apparatus of claim 2, wherein the wireway further comprises an orifice formed in the bracket.

4. The apparatus of claim 3, wherein the cabinet further includes at least one of an input cable and an output cable extending through the wireway to enable coupling of digital access equipment disposed in the cabinet to other equipment disposed in the enclosure.

5. The apparatus of claim 1, wherein the bracket further comprises a U-shaped base and a plate extending substantially perpendicular from the base.

6. The apparatus of claim 5, wherein the base further comprises a main body and a pair of arms extending substantially perpendicular from opposite ends.
of the main body, the plate extending substantially perpendicular from the main body and the arms.

7. The apparatus of claim 6, wherein the plate is attached to the base by a fastening mechanism.

8. The apparatus of claim 6, wherein the bracket is an integral member.

9. The apparatus of claim 5, wherein the fastener further comprises a slot formed in an edge of a free end of the plate and an L-shaped tab extending from the cabinet to selectively engage with the slot.

10. The apparatus of Claim 1, wherein the cabinet provides a weather proof roof environment for digital access equipment disposed within the cabinet.

11. The apparatus of claim 1, wherein the enclosure is a distribution area cross-connect enclosure.

12. The apparatus of claim 1, wherein the enclosure is mounted on a concrete pad.

13. The apparatus of claim 12, wherein the cabinet is mounted on the bracket such that the cabinet is supported by the concrete pad.

14. The apparatus of claim 1, wherein the enclosure comprises a modified housing that is arranged to facilitate attachment of the cabinet.

15. An apparatus for retrofitting an enclosure with a cabinet for digital service access equipment, comprising:
a bracket that is configured to attach to a substantially vertical surface located proximate to the enclosure, wherein the attachment of the bracket to the substantially vertical surface provides a support for the cabinet;
a wireway, wherein at least one of an input cable and an output cable extending through the wireway enables coupling of digital service access equipment disposed in the cabinet to other equipment disposed in the enclosure; and
a fastener for attaching the cabinet to the bracket.

16. The apparatus of claim 15, wherein the substantially vertical surface is a wall.

17. The apparatus of claim 15, wherein the substantially vertical surface is a pole.

18. The apparatus of claim 15, wherein the cabinet is mounted on the bracket such that the cabinet is supported by the substantially vertical surface.