EUROPEAN PATENT SPECIFICATION

Date of publication and mention of the grant of the patent:

Application number: 93108383.6

Date of filing: 24.05.1993

User installed telephone option module to provide additional functions to a basic telephone

Benutzerinstalliertes Telefonzusatzmodul zur Erweiterung eines gewöhnlichen Telefonapparats

Module téléphonique optionnel monté par l’utilisateur pour munir un téléphone ordinaire de fonctions supplémentaires

Designated Contracting States:
DE FR GB

Priority: 25.06.1992 US 903582

Date of publication of application:

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References cited:
WO-A-90/04896

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1. Technical Field

[0001] This invention relates generally to telephones, and, more particularly, optional upgrade circuitry for telephones.

2. Related Art

[0002] Conventional telephone model lines typically include a basic telephone which contains the most basic and common features desired and used by the telephone user. In addition to these basic functions, a desk unit may perform additional functions which the customer may need or desire. Examples of such additional functions include adding a speaker, encryption or decryption of the voice message, adding a headset to the telephone, or interfacing the basic telephone to a recording device.

[0003] One conventional technique used to add these additional upgrades to a basic telephone has been to replace the basic telephone model with another model having the desired functional configuration. A disadvantage of this technique is that it requires maintaining multiple lines of telephones, each comprising one or more different upgrade functions. Another disadvantage is that this technique requires additional trained service personnel to install the new models at the customer site.

[0004] Another conventional technique for providing additional upgrade functions to a basic telephone has been to manufacture the basic telephone model with another module having at least one external device and a rear endcap and electrically connected to said printed wiring assembly and to an endcap and electrically connected to said first connector, said second connector connected to said printed wiring assembly and to an endcap and electrically connected to said first connector, said second connector having at least one external port configured to interface said option module with at least one external device and a rear surface comprising a portion of the outer surface. The present invention provides a user installable option module which contains upgrade circuitry to perform the installation.

SUMMARY OF THE INVENTION

[0007] The present invention provides a user installable option module which contains upgrade circuitry to add additional functions to a basic telephone. This generic upgrade module is capable of containing different sets of electronic circuitry which perform different functions and have different applications. The option module is user installable, and requires neither shipping the original unit to repair or upgrade, nor does it require trained service personnel to visit the customer site to perform the installation.

[0008] The user installed option is installed in the base of a basic telephone. After installation, the option module appears to be an integral part of the basic telephone and is not readily visible to the user. The basic telephone also retains its original footprint. The option module is secured to the basic telephone in such a manner that prevents the option module from being damaged when subjected to significant forces.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The foregoing and other features and examples of the invention will be apparent from the following more particular description of preferred embodiments of the invention as illustrated in the accompanying drawings in which:

Figure 1 is a bottom perspective view of a basic telephone with an option module partially installed.

Figure 2 is a front perspective view of a generic op-
tion module.

Figure 3 is a rear perspective view of a generic option module.

Figure 4 is an exploded view of the option module housing body.

Figure 5 is a top view of a generic printed wiring board installed in an option module.

Figure 6 is a printed wiring assembly for a PC interface option module.

Figure 7 is a printed wiring assembly for a headset/recorder option module.

DETAILED DESCRIPTION OF THE INVENTION

[0010] The preferred embodiment of the present invention is now described with reference to the Figures where like reference numbers refer to like elements.

[0011] Referring to Figure 1, a bottom perspective view of a basic telephone 100 is illustrated. Basic telephone 100 contains two option bays 102A and 102B (collectively or generally referred as 102 in the text), which are symmetrical to each other. Each option bay 102 is functionally identical and can accept an option module 200. Associated with each option bay 102 are three points of contact for securing the option module 200 to the basic telephone 100. The first two are slots 106A and 106B or 106C and 106D (collectively or generally referred as 106 in the text), which will accept a tab insert from the option module 200. The third is a snapping arm 104 which secures the option module 200 on a side opposite slots 106. Connector slots 108A and 108B (collectively or generally referred as 108 in the text), are used by option module 200 to communicate with basic telephone 100. There is one connector slot 108 associated with each option bay 102. Basic telephone 100 has a card edge (not shown) which is accessible by option module 200 through connector slot 108.

[0012] Referring to Figures 2 and 3, option module 200 consists of a housing top 222, housing bottom 206, and an endcap 210. Card edge connector 208 extends through an aperture 228 in a recessed area 214 on the housing top 222. Extending card edge connector 208 through an aperture 228 and positioning it in a recessed area 214 results in the card edge connector 208 being protected by the housing body of the option module 200. This prevents the card edge connector 208 from being damaged from twisting or bending. Card edge connector 208 has an opening 218 for receiving the card edge which is part of the printed wiring assembly of basic telephone 100. Card edge connectors 208 such as the one used here in the preferred embodiment are well known in the art.

[0013] Pivot tabs 212A and 212B (collectively or generally referred as 212 in the text), are part of housing top 222 and are used to secure the option module 200 to the basic telephone 100 when option module 200 is installed in option bay 102. Option module 200 also has two latching edges 224A and 224B (collectively or generally referred as 224 in the text), one on each side of option module 200. Only latching edge 224A is visible in Figures 2 and 3. Latching edge 224B is visible in Figure 4. These two latching edges 224 assist in securing option module 200 to the basic telephone 100. When installed in option bay 102, latching edges 224 secure option module 200 to the basic telephone 100. In the preferred embodiment of the present invention, pivot tabs 212 and latching edges 224 have been used to secure the option module 200 to the basic telephone 100. However, it should be known that other means of securing the option module 200 and option bay 102 are available.

[0014] Installation of option module 200 into basic telephone 100 is achieved without tools of any kind by turning the basic telephone 100 upside down and snapping the option module 200 into position. Pivot tabs 212 on option module 200 fit into slots 106 on the underside of basic telephone 100 and act as pivot points to guide the installation of option module 200 into either option bay 102. Option module 200 is rotated into position, connecting the card edge connector 208 with the card edge on the printed wiring assembly within the basic telephone 100. As the user pushes the option module 200 into place, snapping arm 104 actuates to secure it. The snapping arm 104 is located along the length of option module 200 housing as far away from the pivot tabs 212 as possible. Option module 200 has two latching edges 224 onto which snapping arm 104 can attach. Which latching edge 224 the snapping arm 104 attaches to depends on which option bay 102 option module 200 is installed in. The housing body of option module 200 has a top surface 220 and a bottom surface 202. When option module 200 is inserted into option bay 102, the top surface 220 of option module 200 is placed face down into option bay 102. When completely installed, the bottom surface 202 of option module 200 is substantially flush with the bottom surface 202 of the basic telephone 100. In addition, the endcap surface 204 of endcap 210 is substantially flush with the rear surface 110 of basic telephone 100.

[0015] This firm attachment, coupled with the interlocking recessed position of option module 200 in option bay 102, insures that the option module 200 will not be disengaged due to the pulling of external connections, shock, or vibration. For all practical purposes, the option module 200 has become a part of the basic telephone 100. Option module 200, however, can easily be removed by disengaging the snapping arm 104. Once installed, option module 200 appears to be an integral part of the basic telephone 100 and is not readily visible to the user. The basic telephone 100 retains its original footprint.
In the preferred embodiment of the present invention, basic telephone 100 is a ROLM 60000 series telephone. However, one should know that any basic telephone 100 which can receive, identify, and interface with option module 200 can be used.

Referring to Figure 4, an exploded view of option module 200 is illustrated. Housing bottom 206 has support posts 226 to support the housing top 222 when the housing body is assembled. As illustrated in Figure 2, the housing top 222 is secured to the housing bottom 206 by screws 216A, 216B, and 216C (collectively or generally referred as 216 in the text), which are attached to support posts 226. Housing top 222 and housing bottom 206 of option module 200 always have the same configuration to fit into option bay 102 of basic telephone 100. Housed within housing top 222 and housing bottom 206 of option module 200 is a printed wiring board 400 containing upgrade circuitry to perform a specific function which is not performed by the basic telephone 100. The housing top 222 and housing bottom 206 are interchangeably with the different versions of upgrade circuitry. However, endcap 210 will change with each type of upgrade circuitry to support the external connections necessary.

Referring to Figure 5, printed wiring board 400 positioned in housing body 206 is illustrated. All models of printed wiring board 400 contains circuitry to perform a specific function, card edge connector 208, and connector edge 402. Printed wiring board 400 is shaped such that support posts 226 extending from the housing bottom 206 can extend past the printed wiring board 400 to support the housing top 222. All models of printed wiring board 400 used in option module 200 have a common outline to conform to the housing body 206. Printed wiring board 400 is smaller than the recessed area 214 within housing bottom 206 to enable the printed wiring board 400 to float in the direction of the arrows shown in Figure 5. This insures that the card edge connector 208 and the card edge within the basic telephone 100 will align properly during installation.

Many types of upgrade circuitry which are contained in option module 200 require the option module 200 to interface with external devices other than basic telephone 100. For such upgrades, external connectors are mechanically and electrically connected to the printed wiring board 400 at the location of connector edge 402. For example, referring to Figure 6, printed wiring assembly 500 contains upgrade circuitry which enables the basic telephone 100 to communicate with a personal computer (PC). Secured on printed wiring board 502 is card edge connector 208 for interfacing with basic telephone 100. Connector edge 402 has a 25-pin RS-232 connector 506 secured to it in order to interface with the PC. Endcap 210 is replaced with endcap 504 to enable cable access to the connector 506. In addition to interfacing with a PC, a basic telephone 100 which has a PC interface option module 200 may also interface with any other electronic device having an RS-232 compatible port and the associated interfacing capability.

Referring to Figure 7, printed wiring assembly 600 contains upgrade circuitry which enables the user to record telephone conversations and allow the use of headsets. Secured on printed wiring board 602 is card edge connector 208 for interfacing with the basic telephone 100. Connector edge 402 has an interface containing four connectors secured to it: connector 606 is an RJ-11 connector which provides a recording interface, connector 612 is an RJ-11 connector for a headset interface, and 608 and 610 are a single, 2 prong headset connection. In the preferred embodiment of the present invention, the 2 prong headset connector 608, 610 is manufactured by Switchcraft, Chicago, IL, USA. However, one should know that other types of 2 prong headset connectors and manufactures may be used. Endcap 604 replaces endcap 210 to allow access to these four connectors.

This scheme eliminates the need for any cabling between the basic telephone 100 and the option module 200. As illustrated in Figures 6 and 7, any connectors or switches vital to the functionality of the upgrade circuitry within option module 200 are placed along the connector edge 402 of the printed wiring board 502. An endcap corresponding to the option connector configuration is provided for each unique option type. The option housing or the option module 200 thus provides connections not only to an existing basic telephone 100, but also to an external device or user.

**Claims**

1. An upgrade circuitry option module (200) for a basic telephone (100) having a base with an outer surface, a plurality of option bays (102) on the base, each option bay (102) having a connector slot (108) within it, a first connector (208) connected to said printed wiring assembly (400,502,602) to form an electrical connection between said printed wiring assembly (400,502,602) and the basic telephone (100) when said option module (200) is installed in the option bay (102) of the basic telephone (100); and a second connector (506,608,610) connected to said printed wiring assembly (400,502,602) and to an endcap (210) and electrically connected to said first connector (208), said second connector (506,608,610) having at least one external port configured to interface said option (200) module with at least one external device, and a rear surface comprising a portion of the outer surface, said option module (200) is characterized by a housing body having a bottom surface (202) and a top surface (220), said housing body is configured to fit within and conform to the option bay (102) such that said bottom surface (206) of said option module...
(200) is substantially flush with the outer surface of the base of the basic telephone (100); and in that said endcap (210) is connected to said housing body and configured to be flush with the rear surface (110) of the basic telephone (100) when said option module (200) is installed within the option bay; and in that said printed wiring assembly (400,502,602) is configured to fit loosely within said housing body.

2. The module of claim 1, further comprising a coupling means for securely coupling said option module (200) to the basic telephone (100) when said option module (200) is installed in the option bay (102) of the basic telephone (100).

3. The module of claim 2, wherein said housing body further comprises:

- a housing top (222), having
  - an aperture (228) through which said first connector (208) extends, and
  - a recessed area (214) below said top surface of said housing bottom (206) containing said aperture (228); and a housing bottom (206) having a plurality of support posts (226), configured to support said housing top (222).

4. The module of claim 3, wherein said coupling means comprises:

- a plurality of pivot tabs (212) connected to a first side of said housing body, and configured to align and secure said first side of said housing body while said option module (200) is installed into the option bay (102) of the basic telephone (100); and
- a latching edge (224) connected to said housing body on a second side opposite to said pivot tabs (212) and configured to accept a snapping arm (104), said snapping arm (104) securing said second side to the basic phone (100) when the option module (200) is installed in the option bay (102).

Patentansprüche

1. Aufrüstschaltungstechnik-Optionsmodul (200) für einen Basisfern sprecher (100), der eine Außenfläche, eine Mehrzahl von Optionseinschubfächern (102) an der Basis hat, wobei jedes Optionseinschubfach (102) einen Anschlussschlitz (108) hat, einen ersten Anschluss (208), der mit besagter gedruckter Schaltplatinen-Baugruppe (400, 502, 602) verbunden ist, um eine elektrische Verbindung zwischen besagter gedruckter Schaltplatinen-Baugruppe (400, 502, 602) und dem Basisfern sprecher (100) zu schaffen, wenn besagtes Optionsmodul (200) im Optionseinschubfach (102) des Basisfern sprechers (100) montiert ist; und einen zweiten Anschluss (506, 608, 610), der mit besagter gedruckter Schaltplatinen-Baugruppe (400) und einer Abschlusskappe (210) verbunden ist und elektrisch mit besagtem erstem Anschluss (208) und besagtem zweitem Anschluss (506, 608, 610) verbunden ist und mindestens einen externen Port hat, der so konfiguriert ist, dass er besagtes Optionsmodul (200) mit mindestens einem externen Gerät vernetzt; und eine Rückseite, die einen Anteil der Außenfläche umfasst, wobei besagtes Optionsmodul (200) durch einen Gehäusekörper gekennzeichnet ist, der eine Unterseite (202) und eine Oberseite (220) hat, wobei besagter Gehäusekörper so konfiguriert ist, dass er in das Optionseinschubfach (102) passt und so mit diesem übereinstimmt, dass besagte Unterseite (202) des besagten Optionsmoduls (200) im Wesentlichen bündig mit der Außenfläche der Basis des Basisfern sprechers (100) ist; und dadurch gekennzeichnet, dass besagte Abschlusskappe (210) mit besagtem Gehäusekörper verbunden und so konfiguriert ist, dass sie bündig mit der Rückseite (110) des Basisfern sprechers (100) ist, wenn besagtes Optionsmodul (200) im Optionseinschubfach (102) montiert ist; und dadurch gekennzeichnet, dass besagte gedruckte Schaltplatinen-Baugruppe (400, 502, 602) so konfiguriert ist, dass sie lose in besagten Gehäusekörper passt.

2. Modul nach Anspruch 1, das zusätzlich ein Kupplungsmittel für das sichere Verbinden besagten Optionsmoduls (200) mit dem Basisfern sprecher (100) beinhaltet, wenn besagtes Optionsmodul (200) im Optionseinschubfach (102) des Basisfern sprechers (100) montiert ist.

3. Modul nach Anspruch 2, bei dem besagter Gehäusekörper zusätzlich Folgendes beinhaltet:

- eine Gehäuseoberseite (222), die eine Öffnung (228) hat, durch die sich besagter erster Anschluss (208) erstreckt, und
- einen vertieften Bereich (214) unterhalb besagter Oberseite des besagten Gehäusebodens (206), der besagte Öffnung (228) hat, und
- einen Gehäuseboden (206), der eine Mehrzahl von Tragzapfen (226) hat, die so konfiguriert sind, dass sie besagte Gehäuseoberseite (222)
4. Modul nach Anspruch 3, bei dem besagtes Kupp lungsmittel Folgendes beinhaltet:

eine Mehrzahl von Drehzapfen (212), die an ei ner ersten Seite besagten Gehäusekörpers be festigt und so konfiguriert sind, dass sie besag te erste Seite besagten Gehäusekörpers aus richten und sicher festhalten, wenn besagtes Optionsmodul (200) im Optionseinschubfach (102) des Basisfernsprechers (100) montiert ist; und
eine Rastkante (224), die an besagtem Gehäu sekörper auf einer zweiten Seite gegenüber be sagten Drehzapfen (212) befestigt und so kon figuriert ist, dass sie einen Rastarm (104) auf nimmt, wobei besagter Rastarm (104) besagte zweite Seite am Basisfernsprecher (100) sicher hält, wenn besagtes Optionsmodul (200) im Optionseinschubfach (102) montiert ist.

Revendications

1. Module optionnel (200) de circuits d'amélioration pour un téléphone de base (100) comportant une base avec une surface extérieure, une pluralité de compartiments pour options (102) sur la base, chaque compartiment pour options (102) comportant à l'intérieur une fente pour connecteur (108), un premier connecteur (208) relié audit ensemble de câblage imprimé (400, 502, 602) pour former un raccordement électrique entre ledit ensemble de câblage imprimé (400, 502, 602) et le téléphone de base (100) quand ledit module optionnel (200) est installé dans le compartiment pour options (102) du téléphone de base (100) ; et
2. Module selon la revendication 1, comprenant en outre un moyen de couplage destiné à coupler soli dement ledit module optionnel (200) au téléphone de base (100) quand ledit module optionnel (200) est installé dans le compartiment pour options (102) du téléphone de base (100).
3. Module selon la revendication 2, dans lequel ledit corps de boîtier comprend en outre :
   un haut de boîtier (222) comportant une ouverture (228) à travers laquelle s'étend ledit premier connecteur (208), et une zone évidée (214) au-dessous de ladite surface supérieure dudit bas de boîtier (206), contenant ladite ouverture (228) et un bas de boîtier (206) comportant une pluralité de montants de support (226), configurés pour porter ledit haut de boîtier (222).
4. Module selon la revendication 3, dans lequel ledit moyen de couplage comprend :
   une pluralité de pattes pivotantes (212) reliées à un premier côté dudit corps de boîtier, et configurées pour aligner et fixer ledit premier côté dudit corps de boîtier tandis que ledit module optionnel (200) est installé dans le compartiment pour options (102) du téléphone de base (100) ; et
   un bord de verrouillage (224) relié audit corps de boîtier sur un deuxième côté opposé auxdites pattes pivotantes (212) et configuré pour accepter un bras d'encliquetage (104), ledit bras d'encliquetage (104) fixant ledit deuxième côté au téléphone de base (100) quand le module optionnel (200) est installé dans le compartiment pour options (102).
FIG. 4