

Description

This invention relates to a receptacle connector for mating with a cable connector, the cable connector being of the type having a housing provided with spring-loaded latching members for locking the cable connector to the receptacle connector, said receptacle connector comprising a housing which is provided at one end for mating with the cable connector with a peripheral wall which extends in the insertion direction of the cable connector, a plurality of contact elements being disposed within said peripheral wall.

A receptacle connector of this type, also designed as a cable connector, is disclosed by US-A-4,089,579. In this known connector, the peripheral wall is provided with openings for receiving projecting bosses on the spring loaded latching members of the mating cable connector. When locked, these bosses engage on an edge of the openings.

Cable connectors must often times mate with and lock to receptacle connectors mounted or built into electronic equipment. Such built-in receptacle connectors in fact must be fed in a close fit through an aperture in a wall of the electrical equipment and then mounted. With the known connector, the openings thereof for receiving the latching members of the cable connector will be totally or partially surrounded by the wall of the electrical equipment and totally or partially blocked thereby, respectively, such that engagement of the bosses of the latching members and the openings are not or not readily possible.

Further, receptacle connectors mounted or built into electronic equipment cannot not, however, always be provided with free upright wall parts having openings or recesses to receive the latching members of a mating cable connector.

In order to facilitate latching of cable connectors with such receptacle connectors mounted in electrical equipment, also called mountable connectors, the invention provides a separate locking frame adapted to mount around and to lock to the peripheral wall, said locking frame being provided with receiving and locking means for said latching members of the cable connector.

After the mountable connector is mounted in the electronic equipment, the locking frame can be pushed onto and locked to the peripheral wall thereof. The mountable connector is then provided with means for receiving and locking the latching members of the cable connector.

For locking the locking frame to the peripheral wall of the mountable connector, in a further embodiment of the invention said peripheral wall is provided with boss guide means and locking means, and the locking frame is provided with bosses for mating with said guide means and locking means.

In a yet further embodiment, the boss guide means on the peripheral wall are tapered, such that

slanted boss guide faces are formed in said wall, and extending tapering outwards from a line lying within the peripheral wall at a front side of said wall in the insertion direction of the cable connector into the plane of the peripheral wall, the boss guide faces merging into recessed locking faces lying at right angles to the peripheral wall, said locking frame is provided with bosses disposed on the inside wall for mating with said boss guide faces and said locking faces.

For guiding and locking outward projecting bosses provided on the spring loaded latching members of the housing of the cable connector, in a further embodiment, the inside wall of the locking frame is provided with guide and locking faces for guiding and locking said outward-projecting bosses.

The invention will now be explained in greater detail with reference to the drawings.

Fig. 1 shows an assembly of a cable connector and a built-in receptacle connector;

Fig. 2 shows another receptacle connector for mounting to electrical equipment;

Fig. 3 shows a cable connector and a built-in receptacle connector, the built-in connector being provided with a lip locking frame according to the invention; and

Fig. 4 shows separately the built-in receptacle connector and frame of Fig. 3.

Cable connectors must often times mate with and lock to receptacle connectors mounted or built into electronic equipment. Fig. 1 shows, for example, such a cable assembly. A cable connector 1 is provided with a housing 2 of insulating material provided with resilient, spring loaded locking lips 3. The receptacle connector 4 has a housing 4a of insulating material with free upright wall parts 7 and 8 which are separated by a distance away from a central part 5 provided with contact plug sockets 6. Between these upright wall parts 7 and 8 and the central part 5 is a space adapted to receive a collar 12 of the cable connector 1. Within this collar 12 are pin contacts (not shown) which will be received by the plug sockets 6. When the cable connector 1 is inserted into the receptacle connector 4, detents or bosses 9 on the end of the locking lips 3 are first pressed inwards by the upright walls 7 and 8. When the cable connector 1 is fully seated in the receptacle connector 4, the bosses 1 spring back into the recesses 10 and 11 to latch the connectors together.

Receptacle connectors mounted or built into electronic equipment cannot, however, always be provided with the free upright wall parts 7 and 8. Such built-in receptacle connectors 4 in fact may have a surrounding collar 13 such as shown in Fig. 2 which must be fed in a close fit through an aperture in a wall of the electrical equipment and then mounted. The built-in receptacle connector 4 of Fig. 2 surrounds pin contacts 14. Such a built-in receptacle connector can also be in the form shown in Fig. 1 with plug socket

but without the free upright wall parts 7 and 8. There are also other applications for which the wall parts 7 and 8 cannot be used, so that the cable connector 1 cannot be locked with its lips 3.

This problem can be eliminated according to the present invention through use of lip locking frame 16 shown in Figs. 3 and 4. This frame 16 can be locked on the outside wall of the collar 17 of the built-in receptacle connector 4 which is also shown in Figs. 3 and 4 (see particularly Fig. 4).

The lip locking frame 16 for the cable connector 1 must, of course, also be locked on the built-in connector 4. This is accomplished by locking means disposed, on the one hand, on the collar 17 and, on the other, on the inside wall of the lip locking frame 16. The collar 17 is fitted with side faces 18 which extends outwards at an angle from the free front end of the collar 17 into the plane of the outside wall of the collar. This is followed by a recessed part 19 with a face at right angles to the outside wall of the collar 17.

The lip locking frame 16 is provided with bosses 20 with an upwardly slanting side 21 and a transverse face 22. The bosses 20 are fitted in the lip locking frame 16 in the same way as the faces 18 and 19 on opposite walls of the collar 17 as shown in Fig. 4. When this locking frame 16 is pushed over the collar 17, the bosses 20 are first pressed outwards bating walls 18, and after passing the edge of the face 19 they then spring back. The lip locking frame 16 is then locked onto the built-in connector 4.

To ensure that the cable connector 1 with conventional locking lips 3 and bosses 9 mate and latch with a receptacle connector having the lip locking frame, the lip locking frame 16 is provided with recessed parts 23 and 24 which do not run downwards as far the edge of the locking frame 16, but end at a transverse wall 25 at right angles to the plane of the locking frame 16. The collar 17 can be provided with recessed parts 26, 27 in order to provide additional space for the bosses 9.

When the cable connector 1 is now inserted into the built-in receptacle connector 4, the bosses 9 of the locking lips 3 will be pressed inwards by the parts 23 and 24, until on further displacement 8 the cable connector 1, these bosses 9 through the spring force of the locking lips 3 snap behind the faces 25 of the lip locking frame. The cable connector 1 is herewith now also locked on the built-in connector 4.

The present invention is not limited to the embodiment shown in Figs. 3 and 4, and modifications and additions are possible without going beyond the scope of the invention. For example, the faces 18 and 19 or recesses 26 and 27 can, of course, also be used in the central part 5 of Fig. 1 containing plug sockets 6. The equipment or built-in connector can be either the type with plug pins or one with plug sockets, which also applies to the cable connector mating therewith.

Claims

1. A receptacle connector (4) for mating with a cable connector (1), the cable connector (1) being of the type having a housing (2) provided with spring-loaded latching members (3) for locking the cable connector (1) to the receptacle connector (4), said receptacle connector (4) comprising a housing (4a) which is provided at one end for mating with the cable connector (1) with a peripheral wall which extends in the insertion direction of the cable connector (1), a plurality of contact elements (6,14) being disposed within said peripheral wall, characterized in that said receptacle connector (4) is a mountable connector, comprising a separate locking frame (16) adapted to mount around and to lock to the peripheral wall, said locking frame (16) being provided with receiving and locking means (23,24;25) for said latching members (3) of the cable connector (1).
2. A mountable connector (4) according to claim 1, wherein said peripheral wall is provided with boss guide means (18) and locking means (19), and the locking frame (16) is provided with bosses (20) for mating with said guide means (18) and locking means (19), for locking the locking frame (16) to the peripheral wall.
3. A mountable connector (4) according to claim 2, wherein said contact elements are terminal pins (14) and further comprising a collar (17) surrounding said pins (14), the outside wall of the collar (17) forming said peripheral wall.
4. A mountable connector (4) according to claim 2, wherein the boss guide means on the peripheral wall are tapered, such that slanted boss guide faces (18) are formed in said wall, and extending tapering outwards from a line lying within the peripheral wall at a front side of said wall in the insertion direction of the cable connector (1) into the plane of the peripheral wall, the boss guide faces (18) merging into recessed locking faces (19) lying at right angles to the peripheral wall, said locking frame (16) is provided with bosses (20) disposed on the inside wall for mating with said boss guide faces (18) and said locking faces (19).
5. A mountable connector (4) according to claim 4, wherein the boss guide and locking faces (18,19) are disposed on opposite sides of the peripheral wall.
6. A mountable connector (4) according to claim 2, wherein the inside wall of the locking frame (16) is provided with guide and locking faces



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This problem can be eliminated according to the present invention through use of lip locking frame 16 shown in Figs. 3 and 4. This frame 16 can be locked on the outside wall of the collar 17 of the built-in receptacle connector 4 which is also shown in Figs. 3 and 4 (see particularly Fig. 4).

The lip locking frame 16 for the cable connector 1 must, of course, also be locked on the built-in connector 4. This is accomplished by locking means disposed, on the one hand, on the collar 17 and, on the other, on the inside wall of the lip locking frame 16. The collar 17 is fitted with side faces 18 which extends outwards at an angle from the free front end of the collar 17 into the plane of the outside wall of the collar. This is followed by a recessed part 19 with a face at right angles to the outside wall of the collar 17.

The lip locking frame 16 is provided with bosses 20 with an upwardly slanting side 21 and a transverse face 22. The bosses 20 are fitted in the lip locking frame 16 in the same way as the faces 18 and 19 on opposite walls of the collar 17 as shown in Fig. 4. When this locking frame 16 is pushed over the collar 17, the bosses 20 are first pressed outwards bating walls 18, and after passing the edge of the face 19 they then spring back. The lip locking frame 16 is then locked onto the built-in connector 4.

To ensure that the cable connector 1 with conventional locking lips 3 and bosses 9 mate and latch with a receptacle connector having the lip locking frame, the lip locking frame 16 is provided with recessed parts 23 and 24 which do not run downwards as far the edge of the locking frame 16, but end at a transverse wall 25 at right angles to the plane of the locking frame 16. The collar 17 can be provided with recessed parts 26, 27 in order to provide additional space for the bosses 9.

When the cable connector 1 is now inserted into the built-in receptacle connector 4, the bosses 9 of the locking lips 3 will be pressed inwards by the parts 23 and 24, until on further displacement 8 the cable connector 1, these bosses 9 through the spring force of the locking lips 3 snap behind the faces 25 of the lip locking frame. The cable connector 1 is herewith now also locked on the built-in connector 4.

The present invention is not limited to the embodiment shown in Figs. 3 and 4, and modifications and additions are possible without going beyond the scope of the invention. For example, the faces 18 and 19 or recesses 26 and 27 can, of course, also be used in the central part 5 of Fig. 1 containing plug sockets 6. The equipment or built-in connector can be either the type with plug pins or one with plug sockets, which also applies to the cable connector mating therewith.

Claims

1. A receptacle connector (4) for mating with a cable connector (1), the cable connector (1) being of the type having a housing (2) provided with spring-loaded latching members (3) for locking the cable connector (1) to the receptacle connector (4), said receptacle connector (4) comprising a housing (4a) which is provided at one end for mating with the cable connector (1) with a peripheral wall which extends in the insertion direction of the cable connector (1), a plurality of contact elements (6, 14) being disposed within said peripheral wall, characterized in that said receptacle connector (4) is a mountable connector, comprising a separate locking frame (16) adapted to mount around and to lock to the peripheral wall, said locking frame (16) being provided with receiving and locking means (23, 24; 25) for said latching members (3) of the cable connector (1).
2. A mountable connector (4) according to claim 1, wherein said peripheral wall is provided with boss guide means (18) and locking means (19), and the locking frame (16) is provided with bosses (20) for mating with said guide means (18) and locking means (19), for locking the locking frame (16) to the peripheral wall.
3. A mountable connector (4) according to claim 2, wherein said contact elements are terminal pins (14) and further comprising a collar (17) surrounding said pins (14), the outside wall of the collar (17) forming said peripheral wall.
4. A mountable connector (4) according to claim 2, wherein the boss guide means on the peripheral wall are tapered, such that slanted boss guide faces (18) are formed in said wall, and extending tapering outwards from a line lying within the peripheral wall at a front side of said wall in the insertion direction of the cable connector (1) into the plane of the peripheral wall, the boss guide faces (18) merging into recessed locking faces (19) lying at right angles to the peripheral wall, said locking frame (16) is provided with bosses (20) disposed on the inside wall for mating with said boss guide faces (18) and said locking faces (19).
5. A mountable connector (4) according to claim 4, wherein the boss guide and locking faces (18, 19) are disposed on opposite sides of the peripheral wall.
6. A mountable connector (4) according to claim 2, wherein the inside wall of the locking frame (16) is provided with guide and locking faces



(23,24;25) for guiding and locking outward-projecting bosses (9) provided on the spring-loaded latching members (3) of the housing (2) of the cable connector (1).

7. A mountable connector (4) according to claim 6, wherein the guide and locking faces (23,24;25) for the latching members (3) of the housing (2) of the cable connector (1) are disposed on opposite sides of the peripheral wall, differing from the sides thereof with the guide and locking faces (18,19) for locking the locking frame (16).

Patentansprüche

1. Aufnahmeverbinder (4) zur passenden Aufnahme eines Kabelverbinders (1), wobei der Kabelverbinder (1) derart ausgelegt ist, daß er ein Gehäuse (2) hat, welches mit federbelasteten Verriegelungsteilen (3) zum Sperren des Kabelverbinders (1) an dem Aufnahmeverbinder (4) versehen ist, der Aufnahmeverbinder (4) ein Gehäuse (4a) aufweist, welches an einem Ende zur passenden Aufnahme des Kabelverbinders (1) mit einer Umfangswand versehen ist, welche in Einführungsrichtung des Kabelverbinders (1) verläuft, und bei dem eine Mehrzahl von Kontaktelementen (6, 14) innerhalb der Umfangswand angeordnet ist, dadurch gekennzeichnet,

daß der Aufnahmeverbinder (4) ein Einbauverbinder ist, welcher einen gesonderten Sperrrahmen (16) aufweist, welcher derart ausgelegt ist, daß er um die Umfangswand angebracht und mit dieser gesperrt werden kann, wobei der Sperrrahmen (16) mit Aufnahme- und Sperreinrichtungen (23, 24; 25) für die Verriegelungsteile (3) des Kabelverbinders (1) versehen ist.

2. Einbauverbinder (4) nach Anspruch 1, bei dem die Umfangswand mit Vorsprungsührungseinrichtungen (18) und Sperreinrichtungen (19) versehen ist, und der Sperrrahmen (16) mit Vorsprüngen (20) passend zu den Führungseinrichtungen (18) und Sperreinrichtungen (19) zum sperrenden Festlegen des Sperrrahmens (16) an der Umfangswand versehen ist.
3. Einbauverbinder (4) nach Anspruch 2, bei dem die Kontaktelemente Anschlußstifte (14) sind und bei dem ferner einen die Stifte (14) umgebenden Bund (17) aufweist, wobei die Aussenwand des Bunds (17) die Umfangswand bildet.
4. Einbauverbinder (4) nach Anspruch 2, bei dem die Vorsprungsührungseinrichtungen an der Umfangswand derart abgeschrägt ausgebildet

sind, dass schiefwinklige Vorsprungsührungsf lächen (18) in der Wand gebildet werden, welche in Richtung nach aussen, ausgehend von einer Linie, welche innerhalb der Umfangswand an einer vorderen Seite der Wand liegt, in Einführungsrichtung des Kabelverbinders (1) abgeschrägt verlaufen bis in der Ebene der Umfangswand, bei dem die Vorsprungsührungsf lächen (18) in ausgenommene Sperrf lächen (19) übergehen, welche rechtwinklig zu der Umfangswand liegen, und bei dem der Sperrrahmen (16) mit Vorsprüngen (20) versehen ist, welche auf der Innenwand passend zu den Vorsprungsührungsf lächen (18) und den Sperrf lächen (19) angeordnet sind.

5. Einbauverbinder (4) nach Anspruch 4, bei dem die Vorsprungsührungsf lächen (18, 19) auf gegenüberliegenden Seiten der Umfangswand angeordnet sind.
6. Einbauverbinder (4) nach Anspruch 2, bei dem die Innenwand des Sperrrahmens (16) mit Führungs- und Sperrf lächen (23, 24; 25) zum Führen und Sperren von nach aussen vorspringenden Vorsprüngen (19) versehen ist, welche an den federbelasteten Verriegelungsteilen (3) des Gehäuses (2) des Kabelverbinders (1) vorgesehen sind.
7. Einbauverbinder (4) nach Anspruch 6, bei dem die Führungs- und Sperrf lächen (23, 24; 25) für die Verriegelungsteile (3) des Gehäuses (2) des Kabelverbinders (1) auf gegenüberliegenden Seiten der Umfangswand angeordnet sind, welche sich von den Seiten mit den Führungs- und Sperrf lächen (18, 19) zum Sperren des Sperrrahmens (16) unterscheiden.

Revendications

1. Un connecteur femelle (4) destiné à être accouplé à un connecteur pour câble (1), le connecteur pour câble (1) étant du type comportant un capot (2) muni d'organes d'enclenchement sollicités élastiquement (3) pour verrouiller le connecteur pour câble (1) sur le connecteur femelle (4), ledit connecteur femelle (4) comprenant un logement (4a) muni à l'une de ses extrémités d'une paroi périphérique destinée à l'emboîtement du connecteur pour câble (1) et qui s'étend selon la direction d'insertion du connecteur pour câble (1), une pluralité d'éléments de contact (6, 14) étant disposée à l'intérieur de ladite paroi périphérique, caractérisé en ce que ledit connecteur femelle (4) est une embase comprenant un cadre de verrouillage séparé (16) susceptible d'être



- monté autour de la paroi périphérique et d'y être verrouillé, ledit cadre de verrouillage (16) étant muni de moyens de réception et de verrouillage (23, 24; 25) pour lesdits organes d'enclenchement du connecteur pour câble (1).
2. Un connecteur formant embase (4) selon la revendication 1, dans lequel ladite paroi périphérique est munie de moyens de guidage de protubérance (18) et de moyens de verrouillage (19), et le cadre de verrouillage (16) étant muni de protubérances (20) destinées à venir en correspondance avec lesdits moyens de guidage (18) et lesdits moyens de verrouillage (19 pour verrouiller le cadre de verrouillage (16) sur la paroi périphérique.
 3. Un connecteur formant embase (4) selon la revendication 2, dans laquelle lesdits organes de contact sont des broches (14), l'embase comprenant en outre un collier (17) entourant lesdites broches (14), la paroi extérieure du collier (17) formant ladite paroi périphérique.
 4. Un connecteur formant embase (4) selon la revendication 2, dans lequel les moyens de guidage de protubérance sur la paroi périphérique sont chanfreinés afin de définir des faces de guidage de protubérance inclinées (18) à l'intérieur de ladite paroi, et s'évasant vers l'extérieur à partir d'une ligne située à l'intérieur de la paroi périphérique sur une face frontale de ladite paroi, en suivant dans la direction d'insertion du connecteur pour câble (1) jusqu'au plan de la paroi périphérique, les faces de guidage de protubérance (18) se transformant en faces de verrouillage évidées (19) disposées perpendiculairement à la paroi périphérique, ledit cadre de verrouillage (16) étant muni de protubérances (20) disposées sur la paroi interne et destinées à s'accoupler avec lesdites faces de guidage de protubérance (18) et avec lesdites faces de verrouillage (19).
 5. Un connecteur formant embase (4) selon la revendication 4, dans lequel les faces de guidage de protubérance et les faces de verrouillage (18, 19) sont disposées sur des faces opposées de la paroi périphérique.
 6. Un connecteur formant embase (4) selon la revendication 2, dans laquelle la paroi intérieure du cadre de verrouillage (16) est munie de faces de guidage et de verrouillage (23, 24; 25) pour le guidage et le verrouillage de protubérances dirigées vers l'extérieur (9) prévues sur les organes d'enclenchement sollicités élastiquement (3) du capot (2) du connecteur pour câble (1).
 7. Un connecteur formant embase (4) selon la revendication 6, dans lequel les faces de guidage et de verrouillage (23, 24; 25) pour les organes d'enclenchement (3) du capot (2) du connecteur pour câble (1) sont disposées sur des faces opposées de la paroi périphérique, différents de ces faces de guidage et de verrouillage (18, 19) destinées à verrouiller le cadre de verrouillage (16).