(54) **Connector adapted to handling of different kinds of signals including high-speed signals**

Für die Verarbeitung von verschiedenen Signalarten inklusive Signale mit hoher Geschwindigkeit verwendbarer Verbinder

Connecteur appliqué pour le traitement de différents types de signaux comprenant des signaux à haute vitesse

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Description

Background of the Invention:

[0001] This invention relates to a connector comprising a plurality of conductive contacts arranged in a coupling portion held by an insulator.

[0002] For example, an information processing apparatus such as a personal computer illustrated in Fig. 1 transmits and receives various kinds of signals. For input and output of these signals, the personal computer is provided with a plurality of connectors 11, 12, and 13 different in shape and typically formed on its rear side.

[0003] The connector 11 is intended to be connected to a connector 15 of a docking station 14 or a connector 17 of a port replicator 16. Each of the connectors 12 and 13 is adapted to be connected to a connector 19 of a peripheral device such as a CD (Compact Disk) drive and a DVD (Digital Video Disk) drive. The docking station 14 and the port replicator 16 have connectors 21 and 22, respectively, which can be connected to the connector 19 of the peripheral device 18.

[0004] Thus, the personal computer 10 is adapted to be connected to various types of peripheral devices. Therefore, the connectors 11, 12, and 13 are supplied with various kinds of signals. These signals are different in speed and include a so-called high-speed signal. As well known, a line for transmission and reception of the high-speed signal is typically provided with a shield.

[0005] However, the connectors 11, 12, and 13 of the personal computer 10 are not classified in accordance with the kinds of the signals supplied thereto. Therefore, each of the connector 11, 12, and 13 may be supplied with the various kinds of signals. In this case, wiring for the connectors 11, 12, and 13 is complicated and therefore difficult.

[0006] In case where personal computers manufactured by different manufacturers are selectively connected, connection to the common peripheral device or the common docking station may be defective even if connectors of a same kind are used in the personal computers. This is because pin assignment of the connector is often different for each manufacturer as known in the art.

[0007] Furthermore, if connection to a particular circuit block alone is desired, a special connector for the particular circuit block must be separately equipped in the personal computer. This requires the connector cost and the mounting cost for the special connector.

[0008] From the EP-A-052 3491 a connector according to the preamble of claim 1 is known comprising an insulator and a number of conductive contacts held by the insulator. The contacts are grouped into contact groups and adjacently arranged in a first direction wherein the contact in each group is arranged in a second direction, perpendicular to the first direction.

Summary of the Invention:

[0009] It is therefore an object of this invention to provide a connector in which a number of contacts are grouped into a plurality of groups in a manner adapted to handle various kinds of signals including high-speed signals.

[0010] Other objects of this invention will become clear as the description proceeds. This object is achieved by the features of claim 1. Further advantageous developments are subject-matters of the dependent claims.

Brief Description of the Drawing:

[0011] Fig. 1 is a perspective view for describing the use of a personal computer equipped with conventional connectors;
Figs. 2A, 2B, and 2C are a front view, a plan view, and a right side view of a connector according to a first embodiment of this invention, respectively;
Fig. 3 is a sectional view of a characteristic part of the connector illustrated in Figs. 2A to 2C;
Figs. 4A, 4B, and 4C are a front view, a plan view, and a right side view of a connector according to a second embodiment of this invention, respectively;
Fig. 5 is a sectional view of the connector illustrated in Figs. 4A to 4C when it is connected to a board;
Figs. 6 through 9 are perspective views for describing the use of the connectors in various cases;
Fig. 10 is a sectional view of modifications of the connectors in Figs. 2A to 2C and in Figs. 4A to 4C when they are connected to each other;
Fig. 11 is a view for describing connection of a shield cable to a signal contact and a ground contact of the connector of Fig. 10;
Figs. 12A and 12B show surrounding portions formed on the ground contacts to surround the shield cables, respectively;
Fig. 13 shows a modification of the surrounding portions formed on the ground contacts together with the shield cables;
Fig. 14 is a sectional view of two modifications of the connector in Figs. 4A-4C when they are connected to each other;
Fig. 15 is a sectional view for describing connection of the shield cable to the connector by the use of a locator and shows a state before connection;
Fig. 16 is a sectional view similar to Fig. 15 but shows a state after connection;
Fig. 17 is a sectional view of a modification of connection between the locator and the shield cable;
Fig. 18 is a sectional view of another modification of connection between the locator and the shield cable;
Fig. 19 is a sectional view of a connector according
Description of the Preferred Embodiments:

[0012] Now, description will be made of various embodiments of this invention with reference to the drawing.

[0013] At first referring to Figs. 2A, 2B, 2C, and 3, description will be made of a connector according to a first embodiment of this invention.

[0014] The connector illustrated in the figures is a receptacle connector and comprises an insulator 21, a cylindrical conductive coupling portion 22 held by the insulator 21, and a plurality of conductive contacts 23 arranged within the coupling portion 22 and held by the insulator 21. The conductive contacts 23 are grouped into a plurality of contact groups 24 corresponding to intended uses, respectively, and adjacent to one another in a first direction A1. In each contact group 24, the conductive contacts 23 are arranged in a second direction A2 perpendicular to the first direction A1.

[0015] Among the contact groups 24, one of outermost contact groups located outermost in the first direction A1 is assigned to high-speed signals as a specific contact group. In the specific contact group, the conductive contacts 23 are classified into signal contacts 23a and ground contacts 23b. The signal contacts 23a are arranged in a first array adjacent to the first array in the first direction A1. The ground contacts 23b are arranged in a second array adjacent to the first array in the first direction A1. Each of the signal contacts 23a is adapted to be connected to a signal wire of a shield cable. Each of the ground contacts 23b is adapted to be connected to a shield wire of the shield cable.

[0016] Each of the conductive contacts 23 substantially extends in a third direction A3 perpendicular to the first and the second directions A1 and A2. Therefore, the connector of this type is called a straight-type connector. The specific contact group may be either one of the contact groups 24 located at opposite ends in the first direction A1.

[0017] The signal contacts 23a and the ground contacts 23b are connected to the shield cable through a relay connector 25. Specifically, each of the conductive contacts 23 of the specific contact group has a first contacting portion formed at one end in the third direction A3 to be connected to a mating connector and a second contacting portion formed at the other end in the third direction A3 to be connected to the relay connector 25.

[0018] Referring to Figs. 4A, 4B, 4C and 5, description will be made of a connector according to a second embodiment of this invention.

[0019] The connector illustrated in the figures is also a receptacle connector and comprises an insulator 26, a cylindrical conductive coupling portion 27 held by the insulator 26, and a plurality of conductive contacts 28 arranged within the coupling portion 27 and held by the insulator 26. The conductive contacts 28 are grouped in a plurality of contact groups 29 corresponding to intended uses, respectively, and adjacent to one another in a first direction A1. In each contact group 29, the conductive contacts 28 are arranged in a second direction A2 perpendicular to the first direction A1.

[0020] Among the contact groups 29, one of outermost contact groups located outermost in the first direction A1 is assigned to high-speed signals as a specific contact group. In the specific contact group, the conductive contacts 28 are classified into signal contacts 28a and ground contacts 28b. The signal contacts 28a are arranged in a first array while the ground contacts 28b are arranged in a second array adjacent to the first array in the first direction A1. Each of the signal contacts 28a is adapted to be connected to a signal wire of a shield cable. Each of the ground contacts 28b is adapted to be connected to a shield wire of the shield cable.

[0021] Each of the conductive contacts 28 is folded at an end in the third direction A3 and extends therefrom in the first direction A1 to form a board connecting portion 32 to be connected to the board 31. Therefore, the connector of this type is called an angle-type connector. The specific contact group is a farthest one of the contact groups 29 which is farthest from the board 31.

[0022] Referring to Figs. 6 to 10, various examples of connection will be described.

[0023] In the figures, a connector similar to the connector illustrated in Figs. 4A to 4C and 5 is depicted by a reference numeral 33. Signal transmission by the use of the connector 33 and a mating connector 34 to be connected thereto may be carried out by relay connection as illustrated in Fig. 6 or by board mounting or board-through connection as illustrated in relay connection. In the relay connection, an appropriate circuit block including a connector 35 are inserted so as to readily prevent the disturbance in impedance resulting from crosstalk between board patterns. In the board mounting, the pitch of board patterns 36 is appropriately selected so as to prevent the disturbance in impedance resulting from the crosstalk. In the figures, reference numerals 37 and 38 represent relay connectors, 39, a transmission chip, and 41, a cable.

[0024] Referring to Fig. 8, the connector 33 comprises a structure including two kinds of the above-mentioned connectors integrally combined. With this structure, sig-
nal transmission can be carried out both by the board mounting and by the relay connection.

[0025] Referring to Fig. 9, the connector 33 is adapted to be connected to a plurality of circuit blocks or the connector 35.

[0026] Referring to Fig. 10, description will be made of a modification of the connector illustrated in Figs. 4A to 4C and 5. Similar parts are designated by like reference numerals and will not be described any longer.

[0027] As illustrated in Fig. 10, an angle-type connector 42 is coupled and connected to a straight-type connector 43. In the angle-type connector 42, each of the signal contacts 28a in the specific contact group has a specific connecting portion 44 starting at one end in the third direction A3. The specific connecting portion 44 extends in the first direction A1 in parallel to the board connecting portion 32 and is connected to the board 31. The specific connecting portion 44 may have an end which serves as a surface mounting terminal 45 to be connected to the surface of the board 31.

[0028] The straight-type connector 43 comprises an insulator 46, a conductive cylindrical coupling portion 47 held by the insulator 46, and a plurality of conductive contacts 48 arranged within the coupling portion 47 and held by the insulator 46. The conductive contacts 48 are brought into contact with the conductive contacts 28 of the angle-type connector 42 in one-to-one correspondence. Therefore, the conductive contacts 48 corresponding to the specific contact group are classified into signal contacts 48a as signal paths and ground contacts 48b to be grounded. The signal contacts 48a are arranged in a first array while the ground contacts 48b are arranged in a second array adjacent to the first array in the first direction A1. Each of the signal contacts 48a is adapted to be connected to the signal wire 49a of the shield cable 49. Each of the conductive contacts 55 corresponding to the specific contact group are classified into signal contacts 55a as signal paths and ground contacts 55b to be grounded. The signal contacts 55a are arranged in a first array while the ground contacts 55b are arranged in a second array adjacent to the first array in the first direction A1. Each of the signal contacts 55a is adapted to be connected to the signal wire 49b of the shield cable 49. In other contact groups except the specific contact group, each of the conductive contacts 55 has a board connecting portion 56 starting at an end in the third direction A3 and extending in the first direction A1 towards the board 50 to be connected to the board 50.

[0029] Referring to Figs. 11 through 13, connection of the shield cable 49 will be described.

[0030] In order to connect the shield cable 49, the ground contact 48b is provided with a surrounding portion 51 for surrounding and positioning a part of the shield cable 49 where the shield wire 49b is exposed. The shield wire 49b has a lead portion directly connected to the ground contact 48b by soldering or the like. The surrounding portion 51 may be formed into a shape illustrated in Figs. 12A, 12B, or 13.

[0031] Referring to Fig. 14, description will be made of a modification of connection of the shield cable 49.

[0032] In Fig. 14, the angle-type connector 42 is coupled and connected to another angle-type connector 52. The connectors 42 and 52 are mounted on the board 31 and a board 50, respectively.

[0033] The connector 52 comprises an insulator 53, a cylindrical conductive coupling portion 54 held by the insulator 53, and a plurality of conductive contacts 55 arranged within the coupling portion 54 and held by the insulator 53. The conductive contacts 55 are brought into contact with the conductive contacts 28 of the connector 42 in one-to-one correspondence. Therefore, the conductive contacts 55 corresponding to the specific contact group are classified into signal contacts 55a as signal paths and ground contacts 55b to be grounded. The signal contacts 55a are arranged in a first array while the ground contacts 55b are arranged in a second array adjacent to the first array in the first direction A1. Each of the signal contacts 55a is adapted to be connected to the signal wire 49b of the shield cable 49. Each of the ground contacts 55b is adapted to be connected to the shield wire 49b of the shield cable 49. In other contact groups except the specific contact group, each of the conductive contacts 55 has a board connecting portion 56 starting at an end in the third direction A3 and extending in the first direction A1 towards the board 50 to be connected to the board 50.

[0034] In the specific contact group, each of the conductive contacts 55 is of a straight type and has a first contacting portion formed at one end in the third direction A3 to be brought into contact with the conductive contact 28 of the connector 42 and a second contacting portion formed at the other end in the third direction A3 to be connected to the shield cable 49.

[0035] In order to connect the shield cable 49 to the second contacting portion of the conductive contact 55 of the connector 52, use is made of a locator 57 separate from the conductive contacts 55. The locator 57 places the shield cable 49 in proper position and is engaged with the insulator 53. The locator 57 connects the shield wire 49a and the shield wire 49b of the shield cable 49 to the signal contact 55a and the ground contact 55b, respectively.

[0036] The locator 57 comprises an insulator 58 and a conductive portion 59 held by the insulator 58 and connected to the shield wire 49b. By bringing the conductive portion 59 into contact with the ground contact 55b with the sliding movement in the third direction A3, the shield wire 49b is connected to the ground contact 55b. In this state, the locator 57 is engaged with the insulator 53 and the signal wire 49a is connected to the signal contact 55a.

[0037] Referring to Figs. 15 and 16, description will be made of another modification of connection of the shield cable 49.

[0038] The ground contacts 55b alternately have a processing portion 61 for assisting a contacting operation of the shield wire 49b and a spring portion 62 to be brought into press contact with the conductive portion 59. On the other hand, the shield wire 49b is provided with a lead portion 63.

[0039] The locator 57 with the shield cable 49 connected thereto as illustrated in Fig. 15 is coupled to the connector 52 as illustrated in Fig. 16. In this event, the conductive portion 59 is put into press contact with the spring portion 62 and the lead portion 63 is brought into contact with the processing portion 61. Thus, the shield wire 49b is connected to the ground contact 55b. The
signal wire 49a is connected to the signal contact 55a by soldering or the like.

[0040] As illustrated in Fig. 15, the locator 57 may be provided with envelope portions 57a for surrounding and positioning the shield cable 49. Alternatively, the locator 57 may be provided with a surrounding portion for surrounding and positioning a part of the shield cable 49 where the shield wire 49b is exposed.

[0041] Referring to Fig. 17, the lead portion 63 of the shield wire 49b may be connected to the conductive portion 59 of the locator 57 by press contact, crimping, or soldering.

[0042] Referring to Fig. 18, a part 59a of the conductive portion 59 of the locator 57 is inserted into a hole of the ground contact 55b to establish electrical connection between the conductive portion 59 and the ground contact 55b.

[0043] Referring to Figs. 19 and 20, the conductive portion 59 of the locator 57 may be inserted into the hole of the ground contact 55b in the third direction A3 (Fig. 19) or in the first direction A1 (Fig. 20).

[0044] Referring to Fig. 21, electrical connection between the shield wire 49b and the ground contact 55b may be established via the spring portion 62 of the ground contact 55b.

[0045] In the structure illustrated in each of Figs. 19 through 21, the specific contact group is located at a lower part of the connector 52.

[0046] Referring to Fig. 22, the conductive portion 59 of the locator 57 may be provided with a spring portion 64 instead of the spring portion 62 of the ground contact 55b.

[0047] Referring to Fig. 23, the lead portion 63 of the shield wire 49b may be directly connected to the ground contact 55b by press contact, crimping, or soldering, which, then, does not form a part of the invention.

[0048] Referring to Fig. 24, description will be made of an example of practical application of this invention.

[0049] A display 71 is connected to a connector 72 including a number of contacts arranged within a coupling portion and grouped into a plurality of groups in correspondence to intended uses, respectively, like the above-mentioned connector. On the other hand, DVCs (Digital Video Cameras) 73 and 74 are provided with connectors 75 and 76, respectively. A game apparatus 77 is provided with a connector 78. A mobile telephone apparatus 79 can be selectively connected to the connector 72 connected to the display 71. Thus, the display 71 is simplified in its connector arrangement. The connector 75 is of a straight type while the connector 76 is of an angle type.

[0050] Herein, description is directed to the case where the display is connected to the DVC, the game apparatus, or the mobile telephone apparatus. Howev-
each of the conductive contacts extends in a third direction perpendicular to the first and the second directions, and
the specific contact group is either one of the contact groups at opposite ends in the first direction.

3. The connector according to one of claims 1 to 2, wherein:

each of the conductive contacts in other contact groups except the specific contact group has a board connecting portion starting from an end of the contact in the third direction;
the board connecting portion extends in the first direction away from the specific contact group to be connected to a board, and
the specific contact group is one of the contact groups which is farthest from the board.

4. The connector according to one of claims 1 to 2, wherein each of the conductive contacts in the specific contact group has:

a first contacting portion formed at one end in the third direction to be connected to a mating connector; and
a second contacting portion formed at the other end in the third direction to be connected to a relay connector.

5. The connector according to one of claims 1 to 3, wherein:

each of the conductive contacts in the specific contact group has a specific connecting portion starting from the end of the contact in the third direction; and
the specific connecting portion extends in the first direction in parallel to the board connecting portion to be connected to the board or

wherein the specific connecting portion has a surface mount terminal to be connected to the surface of the board.

6. The connector according to claim 1, wherein:

the ground contacts are provided with a surrounding portion (51) surrounding and positioning a part of the shield cable (49) where the shield wire is exposed.

7. The connector according to claim 1, wherein the locator (57) is provided with a surrounding portion surrounding and positioning a part of the shield cable (49) where the shield wire is exposed or

wherein each of the ground contacts (55b) has a processing portion (61) for assisting a contacting operation of the shield wire (49b).

8. The connector according to claim 1, wherein the locator is connected and disconnected to and from the ground contact 55b with sliding movement.

9. The connector according to claim 8, wherein the ground contact has a spring portion to be brought into contact with the locator.

10. The connector according to claim 1, wherein the locator (57) has a spring portion to be brought into contact with the ground contact.

Patentansprüche

1. Ein Verbinder, aufweisend:

   eine Isolation (21, 26); und
eine Anzahl leitfähiger Kontakte (23, 28), die von der Isolation gehalten werden, wobei die Kontakte in einer Mehrzahl an Kontaktgruppen (24, 29) gruppiert sind, entsprechend den jeweiligen beabsichtigten Verwendungen, und die in einer ersten Richtung (A1) benachbart zueinander sind, wobei die Kontakte (23, 28) in jeder Kontaktgruppe (24, 29) in einer zweiten Richtung (A2) senkrecht zur ersten Richtung angeordnet sind, wobei die Kontaktgruppen (24, 29) eine spezifische Kontaktgruppe enthalten, die sich am weitesten außen in der ersten Richtung befindet und Hochgeschwindigkeitssignalen zugeordnet ist, wobei die leitfähigen Kontakte enthalten:

   Signalkontakte (23a, 28a), die als Signalpfade dienen; und
Erdungskontakte (23b, 28b), die geerdet werden sollen, wobei die spezifische Kontaktgruppe enthält:

   ein erstes Feld, das Signalkontakte aufweist; und
ein zweites Feld, das die Erdungskontakte aufweist und in der ersten Richtung an dem ersten Feld angrenzt, des weiteren aufweisend einen leitfähigen Positionsgeber (57), der von dem Erdungskontakt (55b) getrennt ist und dazu dient, ein Abschirmkabel (49) relativ zu dem Verbinder zu positionieren,

   wobei der Positionsgeber (57) mit einem Abschirmdraht (49b) des Abschirmkabels (49) verbunden ist und mit dem Erdungskontakt (23b, 28b, 55b) ver-
bunden und davon getrennt werden kann, wobei der Positionsgeber den Abschirmdraht elektrisch mit dem Erdungskontakt verbindet, wenn der Positionsgeber mit dem Erdungskontakt verbunden wird, dadurch gekennzeichnet, daß der Positionsgeber (57) eine Isolation (58) und einen leitfähigen Abschnitt (59), der von der Isolation gehalten wird, aufweist und mit dem Abschirmdraht (49b) verbunden ist.

2. Der Verbinder gemäß Anspruch 1, wobei:

sich jeder der leitfähigen Kontakte in einer dritten Richtung senkrecht zu den ersten und zweiten Richtungen erstreckt, und
die spezifische Kontaktgruppe eine der Kontaktgruppen an den gegenüberliegenden Enden in der ersten Richtung ist.

3. Der Verbinder gemäß einem der Ansprüche 1 bis 2, wobei:

jeder der leitfähigen Kontakte in den anderen Kontaktgruppen mit Ausnahme der spezifischen Kontaktgruppe einen Plattenverbindungsschnitt besitzt, der von einem Ende des Kontakts in der dritten Richtung aus beginnt;
sich der Plattenverbindungsschnitt in der ersten Richtung weg von der spezifischen Kontaktgruppe erstreckt, um mit einer Platte verbunden zu werden, und
die spezifische Kontaktgruppe eine der Kontaktgruppen ist, die am weitesten von der Platte entfernt ist.

4. Der Verbinder gemäß einem der Ansprüche 1 bis 2, wobei jeder der leitfähigen Kontakte in der spezifischen Kontaktgruppe besitzt:

 einen ersten Kontaktabchnitt, der an einem Ende in der dritten Richtung ausgebildet ist, um mit einem dazu passenden Verbinder verbunden zu werden; und
einen zweiten Kontaktabchnitt, der am anderen Ende in der dritten Richtung ausgebildet ist, um mit einem Weiterschaltungsverbinder verbunden zu werden.

5. Der Verbinder gemäß einem der Ansprüche 1 bis 3, wobei:

jeder der leitfähigen Kontakte in der spezifischen Kontaktgruppe einen spezifischen Verbindungsschnitt besitzt, der vom Ende des Kontakts in der dritten Richtung startet; und sich der spezifische Verbindungsschnitt in der ersten Richtung parallel zu dem Plattenverbindungsschnitt erstreckt, um mit der Platte verbunden zu werden, oder

wobei der spezifische Verbindungsschnitt einen Oberflächenbefestigungsanschluß besitzt, um mit der Oberfläche der Platte verbunden zu werden.

6. Der Verbinder gemäß Anspruch 1, wobei:

die Erdungskontakte mit einem Umgebungsabschnitt (51) versehen sind, die einen Teil des Abschirmkabels (49) umgeben und dieses positionieren, wo der Abschirmdraht bloß liegt.

7. Der Verbinder gemäß Anspruch 1, wobei der Positionsgeber (57) mit einem Umgebungsabschnitt versehen ist, der einen Teil des Abschirmkabels (49) umgibt und dieses ausrichtet, wo der Abschirmdraht bloß liegt, oder

wobei jeder der Erdungskontakte (55b) einen Verarbeitungsabschnitt (61) besitzt, um einen Kontaktierungsabschnitt des Abschirmdrahts (49b) zu unterstützen.

8. Der Verbinder gemäß Anspruch 1, wobei der Positionsgeber mit dem Erdungskontakt 55b mit einer gleitenden Bewegung verbunden wird und davon gelöst wird.

9. Der Verbinder gemäß Anspruch 8, wobei der Erdungskontakt einen Federabschnitt besitzt, um mit dem Positionsgeber in Kontakt gebracht zu werden.

10. Der Verbinder gemäß Anspruch 1, wobei der Positionsgeber (57) einen Federabschnitt besitzt, um mit dem Erdungskontakt in Kontakt gebracht zu werden.

Revendications

1. Connecteur comprenant :

un isolateur (21, 26) et
un nombre de contacts conducteurs (23, 28) supportés par l'isolateur, les contacts étant groupés en une pluralité de groupes de contacts (24, 29), correspondant aux utilisations prévues, respectivement, et adjacents les uns aux autres dans une première direction (A1), les contacts (23, 28) dans chaque groupe de contacts (24, 29) étant disposés dans une deuxième direction (A2) perpendiculaire à la première direction, les groupes de contacts (24, 29) incluant un groupe spécifique de contacts situé le plus à l’extérieur dans la première direction et associé à des signaux à grande vi-
tresse,
dans lequel les contacts conducteurs incluent :

des contacts de signaux (23a, 28a) servant de voies de signaux, et

des contacts de masse (23b, 28b) à mettre à la masse,

le groupe spécifique de contacts incluant :

un premier arrangement comprenant les contacts de signaux, et

un deuxième arrangement comprenant les contacts de masse, adjacent au premier arrangement dans la première direction,
comprenant également un positionneur conducteur (57) séparé du contact de masse (55b) et servant à positionner un câble blindé (49) relativement au connecteur,
le positionneur (57) étant connecté à un fil blindé (49b) du câble blindé (49) et étant connecté au contact de masse (23b, 28b, 55b) et déconnecté de celui-ci, le positionneur connectant électriquement le fil blindé au contact de masse lorsque le positionneur est connecté au contact de masse,

 caractérisé en ce que

le positionneur (57) comprend un isolateur (58) et une partie conductrice (59) supportée par l'isolateur et connectée au fil blindé (49b).

4. Connecteur selon l'une des revendications 1 à 2, dans lequel chacun des contacts conducteurs dans le groupe spécifique de contacts possède :

une première partie entrant en contact, formée à une extrémité dans la troisième direction, à connecter à un connecteur correspondant, et une deuxième partie entrant en contact, formée à l'autre extrémité dans la troisième direction, à connecter à un connecteur relais.

5. Connecteur selon l'une quelconque des revendications 1 à 3, dans lequel :

chacun des contacts conducteurs dans le groupe spécifique de contacts comporte une partie de connexion spécifique, commençant à partir de l'extrémité du contact dans la troisième direction, et la partie de connexion spécifique s'étend dans la première direction en parallèle à la partie connectant une carte, à connecter à la carte, ou dans lequel la partie de connexion spécifique comporte une borne de montage en surface, à connecter à la surface de la carte.

6. Connecteur selon la revendication 1, dans lequel :

les contacts de masse sont munis d'une partie périphérique (51), entourant et positionnant une partie du câble blindé (49) où le fil blindé est exposé.

7. Connecteur selon la revendication 1, dans lequel le positionneur (57) est muni d'une partie périphérique entourant et positionnant une partie du câble blindé (49) où le fil blindé est exposé, ou dans lequel chacun des contacts de masse (55b) possède une portion de traitement (61) pour permettre une opération de mise en contact du fil blindé (49b).

8. Connecteur selon la revendication 1, dans lequel le positionneur est connecté au contact de masse (55b) et déconnecté de celui-ci par un mouvement coulissant.

9. Connecteur selon la revendication 8, dans lequel le contact de masse comporte une partie de ressort à amener en contact avec le positionneur.
10. Connecteur selon la revendication 1, 
dans lequel 
le positionneur (57) comporte une partie de ressort 
à amener en contact avec le contact de masse.

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FIG. I

RELATED TECHNIQUE