

Description

This invention relates to adapters for moulded electrical plugs. These adapters enable moulded plugs having a pin arrangement incompatible with that of the mains socket, such as 2 pin shaver-plugs, to be connected to the mains.

A known adapter for connecting a 2 pin shaver plug to a three pin mains socket comprises a lower and an upper portion. These portions are removably secured to each other. Extending out from the lower portion in a standard arrangement are the neutral, earth and live pins. The upper portion has two slots through which the pins of the incompatible moulded plug can be pushed. The internal surfaces of the slots are metallic so that when the pins of the incompatible plug are inserted into the slots, they are electrically connected to the metallic portions of the slots. The metallic portions are in turn electrically connected to the live and neutral pins respectively of the lower portion.

When the incompatible plug is required for use, its pins are pushed into the slots of the adapter. The adapter, with the incompatible plug mounted onto it, is then simply pushed into a standard household three pin socket. The incompatible moulded plug is now electrically connected to the mains.

However, problems are associated with such adapters. For example, often the moulded plug can become dislodged from the adapter, thus losing the electrical contact. Also, some moulded 2 pin plugs do not have sufficient insulation about their pins, and so care has to be taken when removing the plug from the adapter while connected to the mains.

US patent no. 4605273 discloses a twist-lock to parallel blade adapter consisting of a cylindrical lower housing section which carries the twist-lock blade terminals on its lower, exterior surface and parallel blade receptacles on its interior surface. A parallel blade power plug may be inserted in these receptacles and a second housing section is then attached by screws to envelop the power plug and to clamp the plug cable between the two housing sections at a distance from the plug itself.

The present invention provides an adapter for a moulded plug which can safely retain the plug. This is achieved by providing an adapter for retaining a moulded plug within itself.

According to the present invention there is provided an adapter for the retention of a moulded plug having a plug body, at least two pins and a cable, within itself comprising:

- an upper and a lower portion;
- a plurality of pins which extend from the lower portion for connecting the adapter to the mains;
- means for securing the moulded plug within the adapter;
- means for receiving in electrical contact re-

spective ones of the plug pins, each receiving means being electrically connected to a respective one of the mains pins; and

means for removably securing the upper portion to the lower portion,

characterized in that the means for securing the moulded plug within the adapter comprises means integral with at least one of the upper and lower portions which is adapted to abut the plug body at a position remote from the cable, to prevent the plug from being dislodged from its connection with the receiving means by movement in a direction towards the cable.

Preferably the lower portion comprises a platform having formed on its periphery an upstanding wall, said platform having a plurality of holes for receiving and supporting the mains pins; and the upper portion comprises a platform having formed on its periphery a depending wall.

A first alternative securing means for the moulded plug comprises an appropriately shaped recess formed by the upper and/or lower portions for receiving all or part of the plug body within the adapter.

A second alternative securing means comprises a plurality of ribs or cones formed on the lower portion, the upper portion or both, which tightly abut the plug when the upper and lower portions are secured together.

A third alternative securing means comprises a series of indentations formed in the upper and/or lower portions of the adapter for receiving the pins.

A fourth alternative securing means comprises a sleeve which fits around part or all of the plug body. The sleeve may have a plurality of ribs for co-operation with suitable grooves formed in the upper and/or lower portions.

A fifth alternative securing means comprises resilient clips located in the adapter for bearing on the body of the plug when located in the adapter.

The above-mentioned securing means may be used alone or in any combination.

Preferably, the means for receiving the plug pins comprise metallic spring clips or sleeves of the appropriate size. The clips or sleeves may be mounted on the lower portion or directly onto the mains pins.

Where the means for receiving the plug pins are not mounted directly on the mains pins, it will be necessary to provide electrical connections from the pin receiving means to the mains pins. Preferably, the electrical connections comprise electrically conductive strips.

Preferably, a fuse arrangement is provided within the lower portion. Advantageously, the fuse is in series with one of the electrical strips.

Suitable means for securing the upper portion to the lower portion may comprise at least one standard screw and thread arrangement. Alternatively, the upper portion may be hinged to the lower portion, the

two portions being interlocked when in a closed position by means of a cam locking mechanism. In another alternative, the securing means may include means for allowing the upper portion to slide over, and be secured to the lower portion and to be locked in place.

A preferred adapter has the standard 3 pin arrangement i.e. a neutral pin, an earth pin and a live pin for connection to the mains, and has three clips mounted within the lower portion for receiving moulded plugs having either 2 pins or 3 pins.

Thus the present invention provides an adapter that can retain moulded plugs, such as 2 pin or 3 pin moulded plugs, within the body of the adapter itself. As the moulded plug is retained within the adapter it cannot become free while in use.

A specific embodiment of an adapter according to the present invention is now described, by way of example only, with reference to the accompanying drawings in which:

Figure 1 is a plan view of the lower portion of the adapter;

Figure 2 is a sectional view of the adapter showing the lower and upper portions;

Figure 3 is a plan view of the lower portion of the adapter with a moulded 2 pin plug located therein; and

Figure 4 is a sectional view of the adapter with a moulded 2 pin plug secured therein.

Referring now to the drawings, there is shown an adapter 1 comprising a lower portion 3 and an upper portion 5. The lower portion comprises a generally square, planar platform 7 having formed on its periphery an upwardly extending wall 9. On one side of the wall 9 there is formed a recess 11, and on the opposite side there is formed a series of small indentations 13. The lower portion 3 also has a plurality of moulded ribs 14 on the upper surface of the platform 7.

Three holes (not shown) are formed within the platform 7. In each hole an electrical pin 15, 17 and 19 is located in such a fashion that one end of each pin is secured just above the platform 7 as shown in Figures 2 and 4, the remainder of the pin extending below the platform. The pins 15, 17 and 19 are respectively the neutral, earth and live pins and are arranged so that the adapter can be plugged into a conventional mains socket.

Two electrically conductive clips 21 and 23 are mounted, by means of electrically conductive supports 25 and 27 respectively, on platform 7. A third electrically conductive clip 29 is mounted, by means of an electrically conductive support 31, directly on the earth pin 17. Two further electrically conductive clips 33 and 35 are mounted on platform 7. These sleeves 33 and 35 provide support for a fuse 37, as shown in Figures 1 and 3.

The clip 21 is electrically connected to the neutral pin 15 by means of an electrically conductive strip 39.

The clip 23 is electrically connected to the first fuse clip 33 by means of a electrically conductive strip 41, and the second fuse clip 35 is electrically connected to the live pin 19 by means of an electrically conductive strip 43.

The upper portion 5 also comprises a generally square, planar platform 45. On the periphery of the platform 45 is formed a depending wall 47. On one side of the wall 47 there is formed a recess 49 which in use is aligned with the recess 11 in the lower portion. A plurality of ribs 50 are moulded onto the lower surface of the upper portion 5.

The adapter 1 is also provided with suitable securing means (not shown) such as one or more screw and thread arrangements for removably securing the lower portion 3 to the upper portion 5 in a fashion as shown generally in Figures 2 and 4.

When required for use, the upper portion 5 is removed from the lower portion 3. A moulded two pin plug 51, such as a shaver plug, is then placed within the lower portion 3, in such a fashion that the first electrical pin 53 of the moulded plug 51 is located within clip 21, and the second electrical pin of the moulded plug 51 is located within clip 23. The moulded plug 51 is then pushed in a direction away from the recess 11, until pins 53 and 55 rest in the small indentations 13. In this arrangement the other end of the plug 51 and the electrical cable 57, joined to the moulded plug 51, protrude from the lower portion 3 through the recess 11. A fuse 37, if necessary, is then mounted between the first and second fuse clips 33 and 35.

The upper body 5 is then secured to the lower body 3, in such a fashion that the recess 49 fits over the rear portion of the plug 51 and the cable 57. Securing the upper portion to the lower portion causes the ribs 14 and 50 to press into the plug body 52. The plug 51 is now secure within the adapter 1 as any form of relative movement is prevented by recess 11, indentations 13 and ribs 14 and 50. The adapter, with the 2 pin moulded plug retained within it, is then inserted into a standard household 3 pin plug socket.

The above example first describes the insertion of a 2 pin plug into the adapter 1. In this arrangement the earth clip 29 is redundant. However, the provision of this clip makes the adapter 1 suitable also for the insertion of a moulded 3 pin plug having an earth. Of course, other suitable earthing means can be provided to be compatible with that of the moulded plug to be fitted, such as a scraping earth (not shown) commonly used in countries such as Germany.

Claims

1. An adapter (1) for the retention of a moulded plug (51) having a plug body (52), at least two pins (53,55) and a cable (57), within itself comprising:

two portions being interlocked when in a closed position by means of a cam locking mechanism. In another alternative, the securing means may include means for allowing the upper portion to slide over, and be secured to the lower portion and to be locked in place.

A preferred adapter has the standard 3 pin arrangement i.e. a neutral pin, an earth pin and a live pin for connection to the mains, and has three clips mounted within the lower portion for receiving moulded plugs having either 2 pins or 3 pins.

Thus the present invention provides an adapter that can retain moulded plugs, such as 2 pin or 3 pin moulded plugs, within the body of the adapter itself. As the moulded plug is retained within the adapter it cannot become free while in use.

A specific embodiment of an adapter according to the present invention is now described, by way of example only, with reference to the accompanying drawings in which:

Figure 1 is a plan view of the lower portion of the adapter;

Figure 2 is a sectional view of the adapter showing the lower and upper portions;

Figure 3 is a plan view of the lower portion of the adapter with a moulded 2 pin plug located therein; and

Figure 4 is a sectional view of the adapter with a moulded 2 pin plug secured therein.

Referring now to the drawings, there is shown an adapter 1 comprising a lower portion 3 and an upper portion 5. The lower portion comprises a generally square, planar platform 7 having formed on its periphery an upwardly extending wall 9. On one side of the wall 9 there is formed a recess 11, and on the opposite side there is formed a series of small indentations 13. The lower portion 3 also has a plurality of moulded ribs 14 on the upper surface of the platform 7.

Three holes (not shown) are formed within the platform 7. In each hole an electrical pin 15, 17 and 19 is located in such a fashion that one end of each pin is secured just above the platform 7 as shown in Figures 2 and 4, the remainder of the pin extending below the platform. The pins 15, 17 and 19 are respectively the neutral, earth and live pins and are arranged so that the adapter can be plugged into a conventional mains socket.

Two electrically conductive clips 21 and 23 are mounted, by means of electrically conductive supports 25 and 27 respectively, on platform 7. A third electrically conductive clip 29 is mounted, by means of an electrically conductive support 31, directly on the earth pin 17. Two further electrically conductive clips 33 and 35 are mounted on platform 7. These sleeves 33 and 35 provide support for a fuse 37, as shown in Figures 1 and 3.

The clip 21 is electrically connected to the neutral pin 15 by means of an electrically conductive strip 39.

The clip 23 is electrically connected to the first fuse clip 33 by means of a electrically conductive strip 41, and the second fuse clip 35 is electrically connected to the live pin 19 by means of an electrically conductive strip 43.

The upper portion 5 also comprises a generally square, planar platform 45. On the periphery of the platform 45 is formed a depending wall 47. On one side of the wall 47 there is formed a recess 49 which in use is aligned with the recess 11 in the lower portion. A plurality of ribs 50 are moulded onto the lower surface of the upper portion 5.

The adapter 1 is also provided with suitable securing means (not shown) such as one or more screw and thread arrangements for removably securing the lower portion 3 to the upper portion 5 in a fashion as shown generally in Figures 2 and 4.

When required for use, the upper portion 5 is removed from the lower portion 3. A moulded two pin plug 51, such as a shaver plug, is then placed within the lower portion 3, in such a fashion that the first electrical pin 53 of the moulded plug 51 is located within clip 21, and the second electrical pin of the moulded plug 51 is located within clip 23. The moulded plug 51 is then pushed in a direction away from the recess 11, until pins 53 and 55 rest in the small indentations 13. In this arrangement the other end of the plug 51 and the electrical cable 57, joined to the moulded plug 51, protrude from the lower portion 3 through the recess 11. A fuse 37, if necessary, is then mounted between the first and second fuse clips 33 and 35.

The upper body 5 is then secured to the lower body 3, in such a fashion that the recess 49 fits over the rear portion of the plug 51 and the cable 57. Securing the upper portion to the lower portion causes the ribs 14 and 50 to press into the plug body 52. The plug 51 is now secure within the adapter 1 as any form of relative movement is prevented by recess 11, indentations 13 and ribs 14 and 50. The adapter, with the 2 pin moulded plug retained within it, is then inserted into a standard household 3 pin plug socket.

The above example first describes the insertion of a 2 pin plug into the adapter 1. In this arrangement the earth clip 29 is redundant. However, the provision of this clip makes the adapter 1 suitable also for the insertion of a moulded 3 pin plug having an earth. Of course, other suitable earthing means can be provided to be compatible with that of the moulded plug to be fitted, such as a scraping earth (not shown) commonly used in countries such as Germany.

Claims

1. An adapter (1) for the retention of a moulded plug (51) having a plug body (52), at least two pins (53,55) and a cable (57), within itself comprising:



an upper (5) and a lower (3) portion;
a plurality of pins (15, 17, 19) which extend from the lower portion (3) for connecting the adapter (1) to the mains;

means (14, 50) for securing the moulded plug (51) within the adapter (1);

means (21, 23, 29) for receiving in electrical contact respective ones of the plug pins (53, 55), each receiving means being electrically connected to a respective one of the mains pins (15, 17, 19); and

means for removably securing the upper portion (5) to the lower portion (3),

characterized in that the means for securing the moulded plug (51) within the adapter (1) comprises means integral with at least one of the upper (5) and lower (3) portions which is adapted to abut the plug body (52) at a position remote from the cable (57), to prevent the plug (51) from being dislodged from its connection with the receiving means (21, 23, 29) by movement in a direction towards the cable (57).

2. The adapter of claim 1, wherein the lower portion comprises a platform (7) having formed on its periphery an upstanding wall (9), said platform (7) having a plurality of holes for receiving and supporting the mains pins (15, 17, 19); and the upper portion (5) comprises a platform (45) having formed on its periphery a depending wall (47).
3. The adapter of claim 1 or claim 2, wherein the securing means comprises an appropriately shaped recess formed by the upper and/or lower portions (3, 5) for receiving all or part of the plug body (52) within the adapter (1).
4. The adapter of claim 1 or claim 2, wherein the securing means comprises a plurality of ribs or cones (14, 50) formed on the lower portion (3), the upper portion (5) or both, which tightly abut the plug when the upper and lower portions are secured together.
5. The adapter of claim 1 or claim 2, including a series of indentations (13) formed in the upper and/or lower portions (5, 3) of the adapter for receiving the pins.
6. The adapter of claim 1 or claim 2, wherein the securing means comprises a sleeve which fits around part or all of the plug body.
7. The adapter of claim 1 or claim 2, wherein the securing means comprises resilient clips located in the adapter for bearing on the body of the plug when located in the adapter.

8. The adapter of any one of claims 1 to 7, wherein the means (21, 23, 29) for receiving the plug pins comprise metallic spring clips or sleeves of the appropriate size.

9. The adapter of any one of claims 1 to 8, wherein a fuse arrangement (33, 35, 37) is provided within the lower portion.

Patentansprüche

1. Anpaßvorrichtung (1), um einen vergossenen Stecker (51) zu halten, der einen Steckerkörper (52), zumindest zwei Steckerstifte (53, 55) sowie ein Kabel (57) besitzt, wobei die Anpaßvorrichtung enthält:
einen oberen (5) und einen unteren (3) Teil;
eine Vielzahl von Steckerstiften (15, 17, 19), die vom unteren Teil (3) verlaufen, um die Anpaßvorrichtung (1) mit dem Netz zu verbinden;
eine Einrichtung (14, 50), um den vergossenen Stecker (51) in der Anpaßvorrichtung (1) zu befestigen;
eine Einrichtung (21, 23, 29), um entsprechende Steckerstifte (53, 55) in einer elektrischen Verbindung aufzunehmen, wobei jede Aufnahmeeinrichtung elektrisch mit einem der Netzsteckerstifte (15, 17, 19) verbunden ist; und
eine Einrichtung, um den oberen Teil (5) am unteren Teil (3) abnehmbar zu befestigen;
dadurch gekennzeichnet, daß die Einrichtung, um den vergossenen Stecker (51) in der Anpaßvorrichtung (1) zu befestigen, eine Einrichtung besitzt, die zumindest dem oberen (5) oder dem unteren (3) Teil gemeinsam ist, wobei sie so aufgebaut ist, um am Steckerkörper (52) an einer vom Kabel (57) entfernten Stelle anzuliegen, um zu verhindern, daß der Stecker (51) durch eine Bewegung in Richtung zum Kabel (57) aus seiner Verbindung mit der Aufnahmeeinrichtung (21, 23, 29) losgerissen wird.
2. Anpaßvorrichtung gemäß Anspruch 1, wobei der untere Teil eine Platte (7) enthält, die an ihrem Rand mit einer aufragenden Wand (9) versehen ist, wobei die Platte (7) eine Vielzahl von Öffnungen besitzt, um die Netzsteckerstifte (15, 17, 19) aufzunehmen; und wobei der obere Teil (5) eine Platte (45) enthält, die an ihrem Rand mit einer herabhängenden Wand (47) versehen ist.
3. Anpaßvorrichtung gemäß Anspruch 1 oder 2, wobei die Befestigungseinrichtung eine geeignet ausgebildete Ausnehmung besitzt, die vom oberen und/oder unteren Teil (3, 5) gebildet wird, um den gesamten oder einen Teil des Steckerkörpers (52) in der Anpaßvorrichtung (1) aufzuneh-



men.

4. Anpaßvorrichtung gemäß Anspruch 1 oder 2, wobei die Befestigungseinrichtung eine Vielzahl von Rippen oder Kegeln (14, 50) besitzt, die am unteren Teil (3), am oberen Teil (5) oder an beiden Teilen ausgebildet sind, wobei sie am Stecker eng anliegen, wenn der obere und der untere Teil aneinander befestigt sind.
5. Anpaßvorrichtung gemäß Anspruch 1 oder 2, wobei die Anpaßvorrichtung eine Reihe von Vertiefungen (13) aufweist, die im oberen und/oder unteren Teil (5, 3) der Anpaßvorrichtung ausgebildet sind, um die Steckerstifte aufzunehmen.
6. Anpaßvorrichtung gemäß Anspruch 1 oder 2, wobei die Befestigungseinrichtung eine Buchse enthält, die um einen Teil oder um den gesamten Steckerkörper sitzt.
7. Anpaßvorrichtung gemäß Anspruch 1 oder 2, wobei die Befestigungseinrichtung Federklammern enthält, die in der Anpaßvorrichtung angeordnet sind, um am Körper des Steckers zu liegen, wenn dieser in der Anpaßvorrichtung angeordnet ist.
8. Anpaßvorrichtung gemäß irgendeinem der Ansprüche 1 bis 7, wobei die Einrichtung (21, 23, 29) für die Aufnahme der Steckerstifte metallene Federklammern oder Buchsen von entsprechender Größe enthält.
9. Anpaßvorrichtung gemäß irgendeinem der Ansprüche 1 bis 8, wobei im unteren Teil ein Sicherungselement-Aufbau (33, 35, 37) vorgesehen ist.

Revendications

1. Adaptateur (1) destiné à retenir une fiche moulée (51) ayant un corps (52) de fiche, au moins deux broches (53, 55) et un câble (57), comportant en lui-même:
 - une partie supérieure (5) et une partie une partie inférieure (3),
 - plusieurs broches (15, 17, 19) qui s'étendent à partir de la partie inférieure (3) pour relier l'adaptateur (1) au réseau,
 - des moyens (14, 50) pour fixer la fiche moulée (51) à l'intérieur de l'adaptateur (1),
 - des moyens (21, 23, 29) pour recevoir avec contact électrique une broche respective des broches de prise (53, 55), chaque moyen de réception étant relié électriquement à une broche respective des broches pour réseau (15, 17, 19), et

des moyens pour fixer de manière amovible la partie supérieure (5) sur la partie inférieure (3),

caractérisé en ce que les moyens pour fixer la fiche moulée (51) à l'intérieur de l'adaptateur (1) sont constitués de moyens venus de matière avec au moins l'une des parties supérieure (5) et inférieure (3) qui sont adaptés pour venir en butée avec le corps (52) de fiche au niveau d'une position éloignée du câble (57) pour empêcher la fiche (51) de sortir de sa liaison avec les moyens de réception (21, 23, 23) par un déplacement dans une direction dirigée vers le câble (57).

2. Adaptateur selon la revendication 1, dans lequel la partie inférieure comporte une plate-forme (7) à la périphérie de laquelle est formée une paroi verticale (9), ladite plate-forme (7) comportant plusieurs trous destinés à recevoir et supporter les broches pour réseau (15, 17, 19), et la partie supérieure (5) comporte une plate-forme (45) ayant à sa périphérie une paroi suspendue (47).
3. Adaptateur selon la revendication 1 ou 2, dans lequel les moyens de fixation comportent une cavité ayant une forme appropriée formée par les parties (3, 5) supérieure et/ou inférieure pour recevoir entièrement le corps (52) de fiche ou une partie de celui-ci à l'intérieur de l'adaptateur (1).
4. Adaptateur selon la revendication 1 ou 2, dans lequel les moyens de fixation comportent plusieurs nervures ou cônes (14, 50) formés sur la partie inférieure (3), la partie supérieure (5) ou les deux, qui viennent en butée de manière serrée avec la fiche lorsque les parties supérieure et inférieure sont fixées ensemble.
5. Adaptateur selon la revendication 1 ou 2, comportant une série d'indentations (13) formées dans les parties (5, 3) supérieure et/ou inférieure de l'adaptateur pour recevoir les broches.
6. Adaptateur selon la revendication 1 ou 2, dans lequel les moyens de fixation comportent un manchon qui s'adapte autour d'une partie ou de la totalité du corps de fiche.
7. Adaptateur selon la revendication 1 ou 2, dans lequel les moyens de fixation comportent des attaches élastiques situées dans l'adaptateur pour venir en appui sur le corps de la fiche lorsqu'il est situé dans l'adaptateur.
8. Adaptateur selon l'une quelconque des revendications 1 à 7, dans lequel les moyens (21, 23, 29) destinés à recevoir les broches de fiche sont



constitués d'attaches ou de manchons formant ressorts métalliques de dimension appropriée.

9. Adaptateur selon l'une quelconque des revendications 1 à 8, dans lequel un agencement (33, 35, 37) formant fusible est agencé à l'intérieur de la partie inférieure.

5

10

15

20

25

30

35

40

45

50

55

6

