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(54) **INCORPORATED POWER LINE CABLE AND FILTER, PARTICULARLY FOR APPLIANCES**

INTEGRIERTES STROMLEITUNGSKABEL UND FILTER INSBESONDERE FÜR HAUSHALTSGERÄTE

CABLE D'ALIMENTATION ET FILTRE INTEGRES, EN PARTICULIER POUR APPAREILS ELECTROMENAGERS

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EP 1 495 515 B1

Description

[0001] The present invention relates to a new constructive solution of the connection for the power supply of appliances and their specific devices, in particular for the integration with radio-frequency interference filters or devices.

[0002] The invention relates particularly to an integrated power line cord and circuit assembly for a device such as an appliance having a side wall or casing, said assembly comprising a supplying electric cable and an electric circuit, in particular a radio frequency interference filter. Such an assembly is disclosed by EP 0 805 617 A1.

[0003] A first innovating feature of this invention is that of providing the end of the appliance power cable with a plate over moulded together with the end of the feeding cable itself, said plate intended to be housed in a hole of the steel sheet or casing of the appliance, the inner surface of this plate being able to be linked by coupling both to a supporting element that holds the e.g. radio frequency interference device and to its wires and electric connections necessary for the working of the appliance and said supporting element being embedded in a box structure that closes and protects the above mentioned parts, assuring their ruggedness according also to the electric connection safety standards.

[0004] The safety standards that foresee the presence of electronic filters able to suppress or reduce the electromagnetic noise coming from the uses of the appliance, besides the constructive regulations intended to avoid the casual opening of the connector block and to assure the fixing solidity of the line cable, have brought the constructor to integrate to the maximum the wires, accomplishing box structures with over moulded contacts inserted into or anyway linked to the printed circuits and able to support both the filter with its wires and the usual electric connector and the cable blocking system in order to minimize the bulk and the times and costs of making the device in accordance to the standards.

[0005] Among the well-known solutions, the above mentioned reference EP 0 805 617 A1 foresees the accomplishment of an integrated connector block-filter group comprising a central body with a hollow that houses the integrated and assembled components of an radio frequency interference filter (RFI filter), while a series of electric contacts are placed on a lateral bracket linked to the main body, to which also a mechanic cable blocking system is applied.

[0006] Other well-known solutions foresee anyway the presence of one or more plates to fix and support the different elements of the RFI filter and the connectors, each solution being different from the others only for the different arrangement of the elements and for their fixing system to the casing or wall of the appliance.

[0007] All the well-known solutions foresee also the embedding of the filter and its wiring system in a bath of electric isolation resin, which is thereafter solidified, and from which only the electric connection come out.

[0008] This common technique of embedding the elements into the resin thereafter solidified is due mainly to the necessity of insulating the filter connections and the power cord ends. In fact this procedure constitutes a serious ecologic problem in case of replacement of the filter-connector group or in case of wear of the appliance, since the solidified resin itself prevents the selection of the different elements according to the kind of material to be recovered, creating not recyclable rejects.

[0009] Furthermore, the necessity of blocking the power cord with a cable clamp to be applied at the mouth of the connector-filter group does not allow to set in time the power cord connections with the electric contacts set in the same group, binding the installator to carry out these connections on each device, only after the introduction and the fixing of the line cable, which brings to a great discomfort during the working, besides discomforts and additional time to fix the cable clamp, that means too much times and costs that draw on the finished products.

[0010] A more recent technique foresees the possibility of only coupling the power cable near the connectors with subsequent blocking of its end by means of the resin placed in the opening in order to insulate its connections with the filter and the connectors. Still this technique foresees the use of a printed circuit that links each wire to the respective contacts of the connector box.

[0011] Also this technique, although it eliminates the presence of a cable clamp to be set during the laying improving the previous technique, presents the disadvantage of using the resin that makes the constructive elements as well as the printed circuit not recoverable, which contributes to create not recyclable rejects.

[0012] A problem underlying to the invention is that of accomplishing an electric connector integrated with another device, in particular with an RFI filter, that can be completely accomplished in advance and directly installed by introduction into the hole of the steel sheet or casing of the appliance to be electrically supplied, without the necessity of carrying out cable blockings and subsequent final wirings, this being accomplished without the use of insulating resins.

[0013] Another problem underlying to the invention is that of recovering and/or ecologically recycle any components of the electric connector and of the filter in case of replacement of one of the components or in case of demolition of the appliance itself, thanks to the elimination of the use of the insulating resin to embed the components or to assemble the printed circuits.

[0014] Yet another problem underlying to the invention is that of accomplishing a wiring between the power line cord contacts and the integrated filter or other device, but guarantee the possibility to replace each components avoiding to replace the whole cable-filtering body.

[0015] Another problem underlying to the invention is that of realizing a structure supporting the electrical connector and the integrated device, i.e. RFI device, that is most reliable, because solid and safe, and easy to be assembled.

[0016] Last but not least a problem underlying to the invention is that of reducing to the minimum the discomforts during the application of the integrated connector block with consequent cut down on the costs and times of application of the connector block itself.

[0017] These problems perfectly have been solved by the invention.

[0018] The subject matter of the invention is an integrated power line cord and circuit assembly for a device having a side wall or casing, particularly for appliances, said assembly comprising a supplying electric cable and an electric circuit, in particular a radio frequency interference filter, characterized in that the supplying electric cable is provided with a first plate moulded together with the cable, said first plate being adapted to be inserted in a hole arranged in said side wall or casing, and being supplied with the electric circuit, the first plate comprises a body having two longitudinal parts with an intermediate hollow, said longitudinal parts being integral with the body and each being provided with two side wings that form openings with respect to the body, the second plate is linked to the first plate in an orthogonal manner and it supports both the connector and a means capable of supporting elements of the electric circuit, said second plate being provided with two guides with head surfaces adapted to assure a temporary joint to the first plate.

[0019] According to the invention there is a second plate supporting an electrical connector and the electric circuit which is connected to the connector, wherein the first plate and the second plate comprise respective joints or connection points for attaching the second plate to the first plate. Preferably there is a box structure which is adapted to be secured to the first plate and the second plate, said box structure reliably and steadily housing and protecting the radio circuit interference filter in co-operation with the first plate and the second plate.

[0020] Preferably the first plate and its two side wings are adapted to be inserted into the hole of the side wall or casing of the appliance to be fed, said hole being provided with openings for the front passage of the wings, while said hole is high enough to allow the gliding downwards of the first plate so that said wings move from the openings to meet an edge of the hole that, with its thickness, snap-shuts into the openings of the first plate.

[0021] Particularly there are electrical contacts included in connector and connected with a basis of the second plate, said contacts being provided with respective ends of electrical connections of cable and with the electric circuit. More particularly there is a grounding device comprising a plate near one of the head surfaces of the second plate, so as to project far enough to be fixed in a further hole arranged in the side wall or casing.

[0022] According to a further advantageous embodiment of the invention the second plate is provided with a couple of slides with a coaxial groove, and with a hooking end having a trigger grip and shoulders to be inserted and blocked in a box structure. Preferably the box structure comprises an upper surface with an opening and guides near edges of the opening, said guides being capable of being linked to the grooves of the slides of the second plate, said box structure further comprising a lowered part arranged on a bottom and having an edge, which edge allows the passage and hooking of the grip so as to axially block the second plate to the box structure.

[0023] According to a still further advantageous embodiment of the invention the first plate comprises a couple of cross guides integral with projections, and the box structure comprises grips arranged on hook-ups of the upper surface, so as to allow said grips to hook up on the cross guides in order to assure a safe and immovable joint of said box structure and of the second plate to the first plate for creating a unique body to be arranged in the hole of the side wall or casing requiring only fixing of a grounding plate into a further hole for the grounding.

[0024] The invention is illustrated by the following detailed description in connection with the enclosed 15 schematic drawings, given only by way example and not limitative, in these:

Fig. 1 represents a front view of the inner side of a filter and electrical connector supporting and fixing plate, it being over moulded together with the end of a wire specific for the kind of appliance to be supplied;

Fig. 2 represents a side view of the same plate of Fig.1;

Fig. 3 represents a top view of the same plate of Fig. 1;

Fig. 4 represents a side view - mainly in axial section along the plane IV-IV of Fig. 5 - of a box structure to be linked to the plate illustrated in Fig. 1, in order to allow also to sustain the filter supporting plate as well as their connections and wirings coming from the over moulded plate of Fig. 1.

Fig. 5 illustrates a side view of the above mentioned box structure illustrated in Fig. 4;

Fig. 6 represents a bottom view - mainly along the plane of the axial section VI-VI of Fig. 7 - of the connector and nominally RFI filter or other device supporting plate to be put into the upper side of the box structure of Fig. 4 and therein fixed;

Fig. 7 is a top view of the same box structure of Fig. 6;

Fig. 8 represents a top view of the assembly of the plate A of Fig. 3 linked to the box structure B of Fig. 5 and to the plate C supporting the connector M illustrated in Fig. 7;

Fig. 9 represents a side section mainly along the plane IX-IX of the assembly illustrated in Fig. 8;

Fig. 10 represents a front view of the perforation template of the steel sheet or casing of the appliance, to which the inner side of the plate of Fig. 1 with its incorporated power line cord and filter are to be linked according to the present invention;

Fig. 11 represents a perspective view of the same assembly of Fig. 8 and 9 as it is embodied to be applied to the appliance to be supplied;

Fig. 12 represents a lateral view in elevation of one plate C' as support of the electric connector M made as a first constructive variation of the invention;

Fig. 13 represents a plane view of the same plate C' of Fig. 12;

Fig. 14 represents an elevation lateral view of the same plate C' of Fig. 12 applied to the head plate A of Fig. 2;

Fig. 15 represents a plane view of the same plate C' of Fig. 12 linked to the head plate A of Fig. 2.

[0025] In all figures the same elements and details are represented or are understood to be represented with the same reference number.

[0026] A first innovating feature of this invention is that of eliminating any forms of cable fixing clamp or any other similar mechanical systems or any resins to block the line cord with the filter or other integrated device, by over moulding one end of the line cable together with the plate to be inserted into the hole of the steel sheet or casing of the appliance to be supplied, said plate being provided with proper hooks to support a box structure able to hold and block the connector, the filter and the respective wirings.

[0027] Another innovation of the invention is given by the fact that the use of usual capacitors and other preinsulated elements is not more necessary to insulate the components of the RFI filter and the connections, it being enough to crimp or weld their contacts onto the ends of the line cable and to do the connections of the RFI filter, in order to reach the desired filtering effect without the necessity of embedding said connections into the resin that avoids the recycle of the components.

[0028] According to the embodiment proposed in the attached drawings, a head plate A accomplished in proper electrically insulating plastic material is moulded together with a power cable 1, previously accomplished for its specific use.

[0029] Said plate A substantially comprises a plane body 10 with a possible camber 11 and with a central hollow 12, said body 10 presenting two projecting longitudinal parts 13 and 14, at the two ends of which wings 13' and 14' are respectively accomplished higher with respect to plane 10.

[0030] From said projecting parts 13 and 14, in a proper position, two opposing longitudinal angle guides 15 and 16, properly designed and below better described, farther project.

[0031] Preferentially laterally from the projection 14, the cable 1 is printed together with the plate A, being covered with a printing protective covering 18 according to the prior art.

[0032] The wings 13' and 14' and the inner side of the body 10 form openings 13A and 14A respectively, with the openings 13A and 14A having a tapering to make their closing onto the edge of a hole accomplished on sheet L of the appliance to be supplied easier, the inner sides of the openings 13A and 14A being lightly tilted.

[0033] The plate A presents a rear shoulder 19 that is visible from the outside of the appliance and that is placed in such a way to work as a stroke end for the cover of the appliance itself, assuring consequently its steady blocking in the hole 80 of the steel sheet or casing L , in which it is housed.

[0034] An opening 20 is accomplished in the lower part of the plate A, clearly to support the plate near the lower edge of the hole 80, which holds it and links it to the appliance.

[0035] A shoulder 21 is made near the guide 15 to work as a stroke end during the association of a plate A with the plate C as below specified.

[0036] As shown in Fig. 4 and 5, a box structure B made of proper insulating plastic material comprises a lower part 30 substantially smooth and provided with head grooves 31 and bottom grooves 32.

[0037] Said structure B presents then an opposing upper part 33 with a wide axial opening 34 and a further head opening 35, said box B having identical head grooves 31 and bottom grooves 32.

[0038] On the longitudinal edges of the opening 34, two outer rectilinear guides 36 are accomplished in relief, while the back side 37 presents a lowered part 38 with an upper opening 39.

[0039] Ribs 40 stiffen the sides 41 and 42 connected to the bottom 37 by means of the above mentioned lowered part 38 and the upper opening 39.

[0040] The space of the upper part 33 between the two couples of lateral grooves 31 determines the presence of the hook-up ends 33' endowed with respective grips 33".

[0041] Likewise, the space of the lower part 30 between the two couples of lateral grooves 31 determines the presence of hook-up ends 30' endowed with respective grips 30".

[0042] With respect to the box perimeter, the lateral sides 41 and 42 present a proper head projection 41' and 42' working as distance piece during the assembling the grounding plate as below described.

[0043] A plate C made of proper electrically insulating plastic material, comprising the electrical connector M, besides the support 67 holding the RFI filter or other device to be applied, is made by a central plain body 51 provided with two lateral guides 52 and 53 having a lon-

gitudinal opening 54, such a length and such a dimension to axially fit into the guides 36 of the box structure B.

[0044] The same central body 51 presents an end provided with a central swell 55 and two lateral protrusions 56 and 57 with stiffening ribs 58, said protrusions 56 and 57 being separated by openings 59, while a hook-up 60 with grip 60' is accomplished with a proper lowered part 51'at the opposed end, laterally to the connector block M and preferentially limited by openings 61.

[0045] A couple of lateral brackets 62 accomplished lower with respect to the plane 51' and with the cooperation of two protrusions 63-64 and 65-66 of the plane 51' allows the housing and the retention of the connecting wires among the different components of the filter or other device to be linked to the connector M.

[0046] Said connector M is provided with necessary electrical contacts 70 made integral with the plane 51 by over moulded or anyway fixing it to the body C, being shaped in such a way and provided with respective hook-ups to be wired with the different parts and to the grounding of the device, according to a known technique, whose constructive details are not considered necessary in this description and which are likewise variable and can be adapted to meet different needs.

[0047] Also the plate C is provided with a couple of lowered planes 50 placed near the respective ends 56 and 57 and working as a shoulder and a consolidating element for the connection of the guides 36 of the box B in the grooves 54 of the slides 52 and 53.

[0048] To complete this description and with reference to Fig. 10 it has to be pointed out that, according to the innovation, a hole 80 is accomplished in a proper position on the steel sheet L or casing of the appliance to be electrically supplied and presents four side widenings 80', said hole 80 and said widenings 80' being dimensioned in such a way to allow the translation of the couple of reliefs 13 and 14, besides the wings 13' and 14' placed on the plate C, the vertical distance between said openings 80' being identical to the distance between the two couples of wings 13' and 14', while the height of the hole 80 must be bigger than the outer distance of the wings 13 and 14 to allow the dropping of said wings13 and 14 until the throat 20 of the plate A leans on the bottom of the hole 80, when the wings 13' and 14' themselves disappear from the holes 80'

[0049] As already said, the contacts 70 of the connector M are linked to the plane 51 of the supporting plate C by over moulded or anyway by applying it on the plate C itself, according one of the known techniques.

[0050] Still according to one of the known techniques, a plate 83 is provided on the head of the plate C to allow the ground connection housed in an opening 12 and projecting from the box B thanks to the opening formed by its distance pieces 41' - 42', in order to be directly linked to the steel sheet L, by means, for example, of screws to be fixed into the holes 82.

[0051] After having described the main components of the invention, their assembling and functions also with reference to the purposes of the invention itself are here below summarised.

[0052] According to one of the assembling procedures referring to a connector M integrated with an RFI filter for appliance only for convenience, the worker brings the plate C near the plate A in order to connect the different wires of the over moulded cable 1 to the different connections of the electrical elements 70 of the connector block M, after having applied the supporting coil 67 and after having linked its winding wires to the other wire elements housed and blocked in the lower side of the plane 51 of the plate C.

[0053] Completed this phase of wiring of cable 1 to the contacts 70 of the connector M, included the grounding 83 linked to the ends 56-57 of the plate C, besides the connection of the RFI filter contacts integrated with the connector M itself, the plate C is aligned to the mouth of the opening 12 of plate A.

[0054] The plate C itself is head driven along the opening 12 so that its guide 55 slides along the outer surface of the guide 15 of plate A, till its side 56 meets the shoulder 21 of plate A, which avoids its prosecution and assures its coaxiality.

[0055] An adequate and temporary linking balance between the vertical plate A and the horizontal plate C is given by the contact between the guide 55 and the guide 15 as well as by the contact between heads 56-57 and the grounding plate 83 against the bottom of the opening 12.

[0056] Thereafter the head of the box B is brought near the bottom of the plate C, in order that the lowered element 51' slips under the thickness of the upper side 33 in correspondence with the wide opening 35.

[0057] Proceeding with the inserting of plate C into the box B, the guides 36 get into the grooves 54 of the slides 52 and 53, till the hook-up 60' of plate C, after having gone over the lowered edge 39 of box B, hooks onto the box B itself, assuring the joint between box B and the upper plate C.

[0058] At the same time the reliefs 50 of plate C close the cover thickness 33, avoiding any possible disengagement of the guide 36 from the seat 54.

[0059] Box B and the cover or plate C are so designed that, together with the clamping of grip 60' that links box B and cover C, grips 30" and 33" snap-shut into the openings of the cross guides 15 and 16 of plate A to link box B and the closing plate A itself.

[0060] Thanks to this procedure the complete six-sides shut of box B and its connector M with the integrated RFI filter is reached by means of the upper supporting plate C and by means of the head plate A, according to an embodiment that guarantees the ruggedness, the reliability of the invented device, besides the interchangeability and recycleability of each part of it, according to the specified aims of the invention.

[0061] Of course, besides the above mentioned advantages the invention achieves also its main purpose, i.e. avoiding both the blockage of the line cable with cable

clamps or any other mechanical system and the disadvantages linked to the use of insulating resins for the over mouldeding of the cable 1 onto plate A.

[0062] In Fig. 10 and 11 it is clear that the installator or the technician that repairs the appliance to be supplied and to be provided with an integrated RFI filter has only to insert the group comprising the parts A-B and C till now described and schematically illustrated in Fig. 11, into the hole 80 accomplished in the steel sheet L or casing of the appliance, so that the wings 13' and 14' pass into the groove 80' of hole 80, while the rest 10 of plate A remains outside said hole 80, the worker having then only to lower said group A-B-C till the throat 20 of plate A rests on the lower edge of hole 80.

[0063] The sloping of the inner sides of the wings 13' and 14' assures a progressive closing of the steel sheet L or casing into the grooves 13A - 14A, so as to guarantee a steady and immovable fitting of said group A-B-C into the seat 80 that contains and supports it, creating a reliable and safe support for connector M integrated with the RFI filter, without using any cable clamps or other mechanical fixing systems to block the power cable and without using insulating resins that make the different parts of the device not recyclable and replaceable, in accordance to the purposes of this invention.

[0064] It is highlighted then, that the vent holes 31 and 32 accomplished on the lower part 30 and on the upper part 33 of box B assure the cooling of eventual coils or other overheating elements, still without resorting to any insulating resins.

[0065] In this description, only the main elements of assembly and operation of the proposed invention have been illustrated, while other secondary aspects are represented and not described for better descriptive simplicity, their presence not being substantial for the realization of the invention.

[0066] As already indicated, Fig. 12 to 15 represent the constructive particulars of a first constructive variation of the invention, in particular of the plate C' that supports the connector M, for an electrical connection solution of anti-disturbing for appliances that, even though reductive and less effective than the one till now described, assures however sufficient solidity and a sure minor obstacle, beyond a reduced cost.

[0067] According to this constructive variation, connector M is linked to the wall 51' of the plate that comprises analogous parts 55' and 57'-56' in order to slip itself into guides 15 and 16 of the head plate A, without being associated to some box structure element B that can be dispensed with, in order to reduce blocks of the connection.

[0068] Naturally the same solutions till now described and illustrated, can be reached with other embodiments.

[0069] Only to illustrate, another solution could be that of using the box structure B till now described to link a connector M to one or more signal transmitting or receiving devices with or without the RFI filter.

[0070] This invention can foresee also the partial or total replacement of the hooking elements, i.e. the hook-up 60' and 30"-33" with other movable connecting mechanical systems, or it is possible to prepare the cable 1 to be printed on any point of plate A.

[0071] These and other variations or adjustments belong anyway to the improvement to be protected.

Claims

1. Integrated power line cord and circuit assembly for a device having a side wall (L) or casing for appliances, said assembly comprising:

   - a supplying electric cable (1),
   - a radio frequency interference filter;
   - the supplying electric cable (1) is provided with a first plate (A) moulded together with the cable (1), said first plate (A) being adapted to be inserted in a hole (80) arranged in said side wall (L) or casing, and being supplied with the radio circuit interference filter;
   - a second plate (C) supporting an electrical connector (M) and the radio circuit interference filter which is radio circuit interference filter connected to the connector (M), the first plate (A) and the second plate (C) comprise respective joints or connection points (12, 15,21, 56,57) for attaching the second plate (C) to the first plate (A), the first plate (A) comprises a body (10) having two longitudinal parts (13,14) with an intermediate hollow (12), said longitudinal parts (13, 14) being integral with the body (10) and each being provided with two side wings (13', 14') that form openings (13A, 14A) with respect to the body (10);

   characterized in that the second plate (C) is linked to the first plate (A) in an orthogonal manner and it supports both the connector (M) and a means (67) capable of supporting elements of the radio circuit interference filter said second plate (C) being provided with two guides (55) with head surfaces (56, 57) adapted to assure a temporary joint to the first plate (A).

2. Integrated power line cord and circuit assembly according to claim 1, **characterized by** a box structure (B) which is adapted to be secured to the first plate (A) and the second plate (C), said box structure (B) reliably and steadily housing and protecting the radio circuit interference filter in co-operation with the first plate (A) and the second plate (C).

3. Integrated power line cord and circuit assembly according to claim 1, **characterized in that** the first plate (A) and its two side wings (13', 14') are adapted to be inserted into the hole (80) of the side wall (L)

or casing of the appliance to be fed, said hole (80) being provided with openings (80') for the front passage of the wings (13', 14'), while said hole (80) is high enough to allow the gliding downwards of the first plate (A) so that said wings (13', 14') move from the openings (80') to meet an edge of the hole (80) that, with its thickness, snap-shuts into the openings (13A, 14A) of the first plate (A).

4. Integrated power line cord and circuit assembly according to claim 1, **characterized by** electrical contacts (70) included in connector (M) and connected with a basis (51) of the second plate (C), said contacts (70) being provided with respective ends of electrical connections of cable (1) and with the radio circuit interference filter.

5. Integrated power line cord and circuit assembly according to claim 4, **characterized by** a grounding device comprising a plate (83) near one of the head surfaces (57, 58) of the second plate (C), so as to project far enough to be fixed in a further hole (82) arranged in the side wall (L) or casing.

6. Integrated power line cord and circuit assembly according to any of claims 1 to 5, **characterized in that** the second plate (C) is provided with a couple of slides (52,53) with a coaxial groove (54), and with a hooking end (60) having a trigger grip (60') and shoulders (50) to be inserted and blocked in a box structure (B).

7. Integrated power line cord and circuit assembly according to claim 6, **characterized in that** the box structure (B) comprises an upper surface (33) with an opening (34) and guides (36) near edges of the opening (34), said guides (36) being capable of being linked to the grooves (54) of the slides (52,53) of the second plate (C), said box structure (B) further comprising a lowered part (38) arranged on a bottom (37) and having an edge (39), which edge (39) allows the passage and hooking of the grip (60') so as to axially block the second plate (C) to the box structure (B).

8. Integrated power line cord and circuit assembly according to any of claims 2 to 7, **characterized in that** the first plate (A) comprises a couple of cross guides (15,16) integral with projections (13,14), and the box structure comprises grips (30", 33") arranged on hook-ups (30', 33') of the upper surface (33), so as to allow said grips (30", 33") to hook up on the cross guides (15,16) in order to assure a safe and immovable joint of said box structure (B) and of the second plate (C) to the first plate (A) for creating a unique body to be arranged in the hole (80) of the side wall (L) or casing requiring only fixing of a grounding plate (83) into a further hole (82) for the grounding.

Patentansprüche

1. Integriertes Stromleitungskabel und Stromkreisanordnung für eine Vorrichtung mit einer Seitenwand (L) oder einem Gehäuse für Haushaltsgeräte, wobei die Anordnung umfaßt:

- ein Versorgungsstromkabel (1),
- einen Funkfrequenzinterferenzfilter,
- wobei das Versorgungsstromkabel (1) mit einer ersten Platte (A) versehen ist, die zusammen mit dem Kabel (1) ausgeformt ist, wobei die erste Platte (A) dazu ausgelegt ist, in eine Öffnung (80) eingeführt zu werden, die in der Seitenwand (L) oder dem Gehäuse angeordnet ist, und wobei sie mit dem Funkkreisinterferenzfilter versorgt wird,
- eine zweite Platte (C), die einen elektrischen Verbinder (M) und den Funkkreisinterferenzfilter, der mit dem Verbinder (M) verbunden ist, trägt, wobei die erste Platte (A) und die zweite Platte (C) jeweils Gelenke oder Verbindungspunkte (12, 15, 21, 56, 57) zum Befestigen der zweiten Platte (C) an der ersten Platte (A) umfassen, wobei die erste Platte (A) einen Körper (10) umfaßt, der zwei Längsteile (13, 14) mit einer intermediären Aussparung (12) aufweist, wobei die Längsteile (13, 14) integral mit dem Körper (10) ausgebildet und jeweils mit zwei Seitenflügeln (13', 14') versehen sind, die Öffnungen (13A, 14A) in bezug auf den Körper (10) ausbilden,

dadurch gekennzeichnet, daß die zweite Platte (C) mit der ersten Platte (A) in einer orthogonalen Weise gekoppelt ist und sie sowohl den Verbinder (M) als auch ein Mittel (67) trägt, das geeignet ist, Elemente des Funkkreisinterferenzfilters zu tragen, wobei die zweite Platte (C) mit zwei Führungen (55) mit Kopfflächen (56, 57) versehen ist, die dazu ausgelegt sind, eine vorübergehende Verbindung mit der ersten Platte (A) sicherzustellen.

2. Integriertes Stromleitungskabel und Stromkreisanordnung nach Anspruch 1, **kennzeichnet durch** eine Schachtelstruktur (B), die dazu ausgelegt ist, an der ersten Platte (A) und der zweiten Platte (C) befestigt zu sein, wobei die Schachtelstruktur (B) verläßlich und stetig den Funkkreisinterferenzfilter in Zusammenwirken mit der ersten Platte (A) und der zweiten Platte (C) beherbergt und schützt.

3. Integriertes Stromleitungskabel und Stromkreisanordnung nach Anspruch 1, **dadurch gekennzeichnet, daß** die erste Platte (A) und ihre beiden Seitenflügel (13', 14') dazu ausgelegt sind, in die Öffnung (80) der Seitenwand (L) oder des Gehäuses des zu versorgenden Haushaltsgerätes eingeführt zu wer-

den, wobei die Öffnung (80) mit Öffnungen (80') für den Vorderdurchgang der Flügel (13', 14') versehen ist, während die Öffnung (80) hoch genug ist, um das Heruntergleiten der ersten Platte (A) zuzulassen, so daß die Flügel (13', 14') sich von den Öffnungen (80') bewegen, um eine Kante der Öffnung (80) zu treffen, die mit ihrer Dicke in die Öffnungen (13A, 14A) der ersten Platte (A) klickend einrastet.

4. Integriertes Stromleitungskabel und Stromkreisanordnung nach Anspruch 1, **gekennzeichnet durch** elektrische Kontakte (70), die in dem Verbinder (M) enthalten sind und mit einer Basis (51) der zweiten Platte (C) verbunden sind, wobei die Kontakte (70) mit entsprechenden Enden von elektrischen Verbindungen des Kabels (1) und mit dem Funkkreisinterferenzfilter versehen sind.

5. Integriertes Stromleitungskabel und Stromkreisanordnung nach Anspruch 4, **gekennzeichnet durch** eine Erdungsvorrichtung, die eine Platte (83) in der Nähe von einer der Kopfflächen (57, 58) der zweiten Platte (C) umfaßt, so daß sie weit genug hervorsteht, um in einer weiteren Öffnung (82), die in der Seitenwand (L) oder dem Gehäuse angeordnet ist, befestigt zu werden.

6. Integriertes Stromleitungskabel und Stromkreisanordnung nach einem der Ansprüche 1 bis 5, **dadurch gekennzeichnet, daß** die zweite Platte (C) mit einem Paar Gleitstücken (52, 53) mit einer koaxialen Nut (54) und mit einem Einhakende (60) versehen ist, das einen Auslösegriff (60') und Schultern (50) aufweist, die in eine Schachtelstruktur (B) einzuführen und darin zu arretieren sind.

7. Integriertes Stromleitungskabel und Stromkreisanordnung nach Anspruch 6, **dadurch gekennzeichnet, daß** die Schachtelstruktur (B) eine Oberseite (33) mit einer Öffnung (34) und Führungen (36) in der Nähe von Kanten der Öffnung (34) umfaßt, wobei die Führungen (36) dazu fähig sind, mit den Nuten (54) der Gleitstücke (52, 53) der zweiten Platte (C) gekoppelt zu werden, wobei die Schachtelstruktur (B) ferner einen unteren Teil (38) umfaßt, der an einem Boden (37) angeordnet ist und eine Kante (39) aufweist, welche Kante (39) den Durchgang und das Einhacken des Griffes (60') zuläßt, so daß die zweite Platte (C) an der Schachtelstruktur (B) axial arretiert wird.

8. Integriertes Stromleitungskabel und Stromkreisanordnung nach einem der Ansprüche 2 bis 7, **dadurch gekennzeichnet, daß** die erste Platte (A) ein Paar Querführungen (15, 16) umfaßt, die integral mit Vorsprüngen (13, 14) ausgebildet sind, und die Schachtelstruktur Griffe (30", 33") umfaßt, die an Anschlüssen (30', 33') der Oberseite (33) angeordnet sind, um es den Griffen (30", 33") zu erlauben, an die Querführungen (15, 16) anzukoppeln, um eine sichere und unbewegliche Verbindung der Schachtelstruktur (B) und der zweiten Platte (C) mit der ersten Platte (A) sicherzustellen zum Erzeugen eines einzelnen Körpers, der in der Öffnung (80) der Seitenwand (L) oder des Gehäuses angeordnet werden soll, wozu nur Befestigen einer Erdungsplatte (83) in einer weiteren Öffnung (82) zum Erden benötigt wird.

Revendications

1. Câble conducteur de courant intégré et assemblage de circuit pour un dispositif ayant une paroi latérale (L) ou un boîtier pour appareils domestiques, ledit assemblage comprenant:

- un câble d'alimentation électrique (1),
- un filtre d'interférence de fréquence radio,
- ledit câble d'alimentation électrique (1) étant pourvu d'une première plaque (A) venue de moulage avec ledit câble (1), ladite première plaque (A) étant adaptée pour être insérée dans un trou (80) ménagé dans ladite paroi latérale (L) ou ledit boîtier, et étant alimentée par le filtre d'interférence de circuit radio,
- une deuxième plaque (C) supportant un connecteur électrique (M) et ledit filtre d'interférence de circuit radio qui est relié audit connecteur (M), ladite première plaque (A) et ladite deuxième plaque (C) comprenant chacune des joints ou points de connexion (12, 15, 21, 56, 57) pour attacher ladite deuxième plaque (C) à ladite première plaque (A), la première plaque (A) comprenant un corps (10) ayant deux parties longitudinales (13, 14) avec un creux intermédiaire (12), lesdites parties longitudinales (13, 14) étant réalisées d'un seul tenant avec ledit corps (10) et étant pourvues chacune de deux ailes latérales (13', 14') qui forment des orifices (13A, 14A) par rapport audit corps (10),

caractérisés par le fait que ladite deuxième plaque (C) est couplée à ladite première plaque (A) d'une manière orthogonale et qu'elle porte aussi bien ledit connecteur (M) qu'un moyen (67) qui est apte à porter des éléments dudit filtre d'interférence de circuit radio, ladite deuxième plaque (C) étant pourvue de deux guides (55) avec des surfaces de tête (56, 57) adaptés pour assurer une liaison temporaire avec ladite première plaque (A).

2. Câble conducteur de courant intégré et assemblage de circuit selon la revendication 1, **caractérisés par** une structure en boîte (B) qui est adaptée pour être fixée sur ladite première plaque (A) et ladite deuxiè-

me plaque (C), la structure en boîte (B) logeant et protégeant d'une manière fiable et permanente ledit filtre d'interférence de circuit radio en coopération avec ladite première plaque (A) et ladite deuxième plaque (C).

3. Câble conducteur de courant intégré et assemblage de circuit selon la revendication 1, **caractérisés par le fait que** ladite première plaque (A) et ses deux ailes latérales (13', 14') sont adaptées pour être insérées dans ledit trou (80) de la paroi latérale (L) ou du boîtier de l'appareil domestique à alimenter, ledit trou (80) étant pourvu d'orifices (80') pour le passage avant des ailes (13', 14'), tandis que le trou (80) présente une hauteur suffisante pour permettre à ladite première plaque (A) de glisser vers le bas de sorte que les ailes (13', 14') se déplacent depuis lesdits orifices (80') afin de rencontrer un bord dudit trou (80) qui, avec son épaisseur, s'engage à encliquetage dans les orifices (13A, 14A) de ladite première plaque (A).

4. Câble conducteur de courant intégré et assemblage de circuit selon la revendication 1, **caractérisés par** des contacts électriques (70) inclus dans ledit connecteur (M) et connectés à une base (51) de ladite deuxième plaque (C), lesdits contacts (70) étant pourvus d'extrémités respectives de connexions électriques du câble (1), et du filtre d'interférence de circuit radio.

5. Câble conducteur de courant intégré et assemblage de circuit selon la revendication 4, **caractérisés par** un dispositif de mise à la terre qui comprend une plaque (83) à proximité de l'une des surface de tête (57, 58) de la deuxième plaque (C) de sorte qu'il fait saillie suffisamment pour être fixé dans un autre trou (82) qui est ménagé dans ladite paroi latérale (L) ou ledit boîtier.

6. Câble conducteur de courant intégré et assemblage de circuit selon l'une quelconque des revendications 1 à 5, **caractérisés par le fait que** ladite deuxième plaque (C) est pourvue d'une paire de coulisseaux (52, 53) avec une rainure coaxiale (54) et d'une extrémité d'accrochage (60) ayant une poignée-déclic (60') et des épaules (50) à insérer et à bloquer dans une structure en boîte (B).

7. Câble conducteur de courant intégré et assemblage de circuit selon la revendication 6, **caractérisés par le fait que** ladite structure en boîte (B) présente une surface supérieure (33) avec une ouverture (34) et des guides (36) à proximité de bords de ladite ouverture (34), lesdits guides (36) étant aptes à être couplés aux rainures (54) des coulisseaux (52, 53) de ladite deuxième plaque (C), ladite structure en boîte (B) comprenant en outre une partie inférieure (38) disposée sur un fond (37) et ayant un bord (39), ledit bord (39) permettant le passage et l'accrochage de la poignée (60') de sorte que la deuxième plaque (C) soit arrêtée axialement sur ladite structure en boîte (B).

8. Câble conducteur de courant intégré et assemblage de circuit selon l'une quelconque des revendications 2 à 7, **caractérisés par le fait que** ladite première plaque (A) comprend une paire de guides transversaux (15, 16) qui sont faits d'un seul tenant avec des projections (13, 14), et ladite structure en boîte (B) comprend des poignées (30", 33") qui sont disposées sur des raccords (30', 33') de la surface supérieure (33) pour permettre aux poignées (30", 33") de se raccorder sur les guides transversaux (15, 16) afin d'assurer une liaison sûre et immobile de ladite structure en boîte (B) et de ladite deuxième plaque (C) avec la première plaque (A) pour créer un corps unique à insérer dans ledit trou (80) de la paroi latérale (L) ou du boîtier, ne nécessitant qu'une fixation d'une plaque de mise à la terre (83) dans un autre trou (82) pour la mise à la terre.

fig. 1

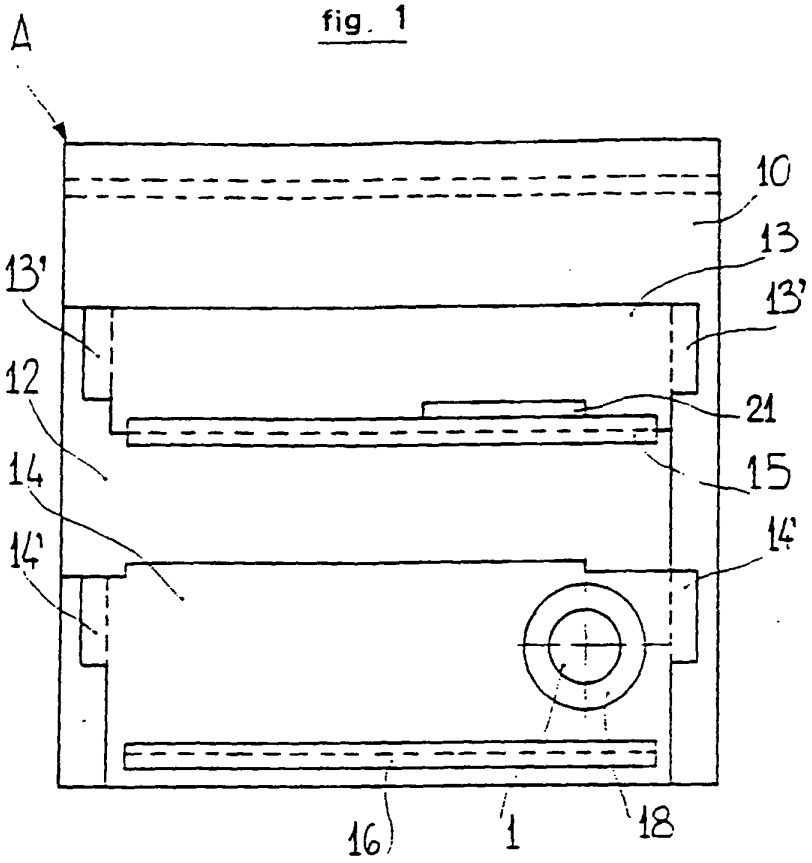

A
10
13
13'
13'
12
21
15
14
14'
14'
16
1
18

fig. 2

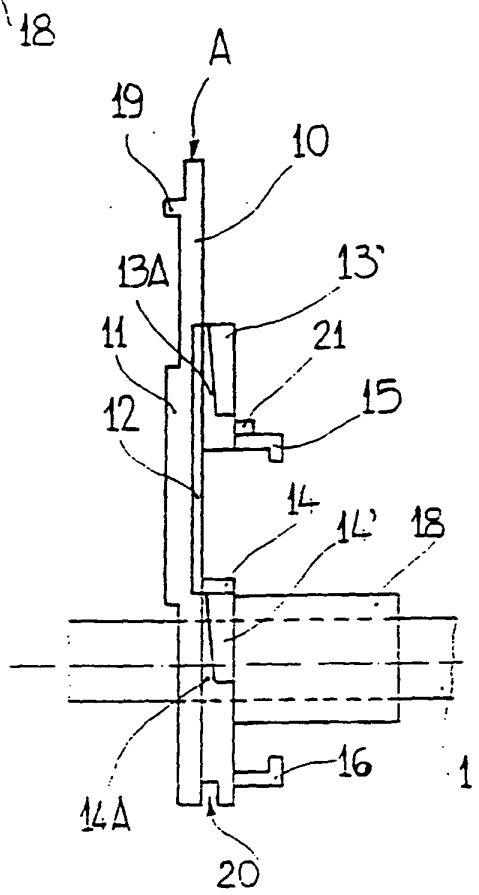

A
19
10
13A
13'
11
21
15
12
14
14'
18
16
1
14A
20

fig. 3

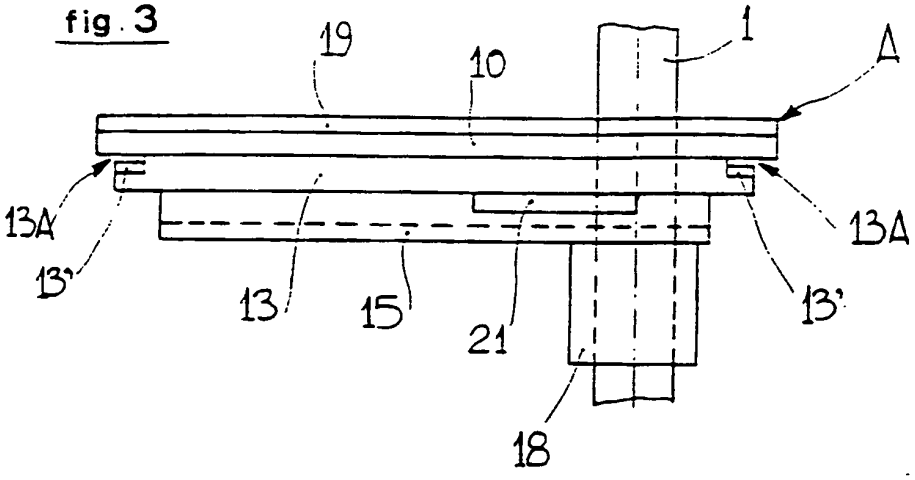


fig. 4

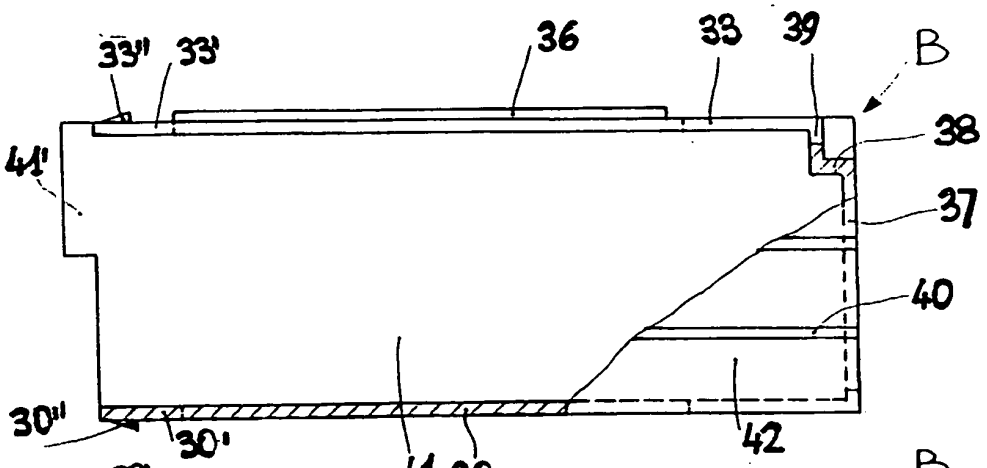


fig 5

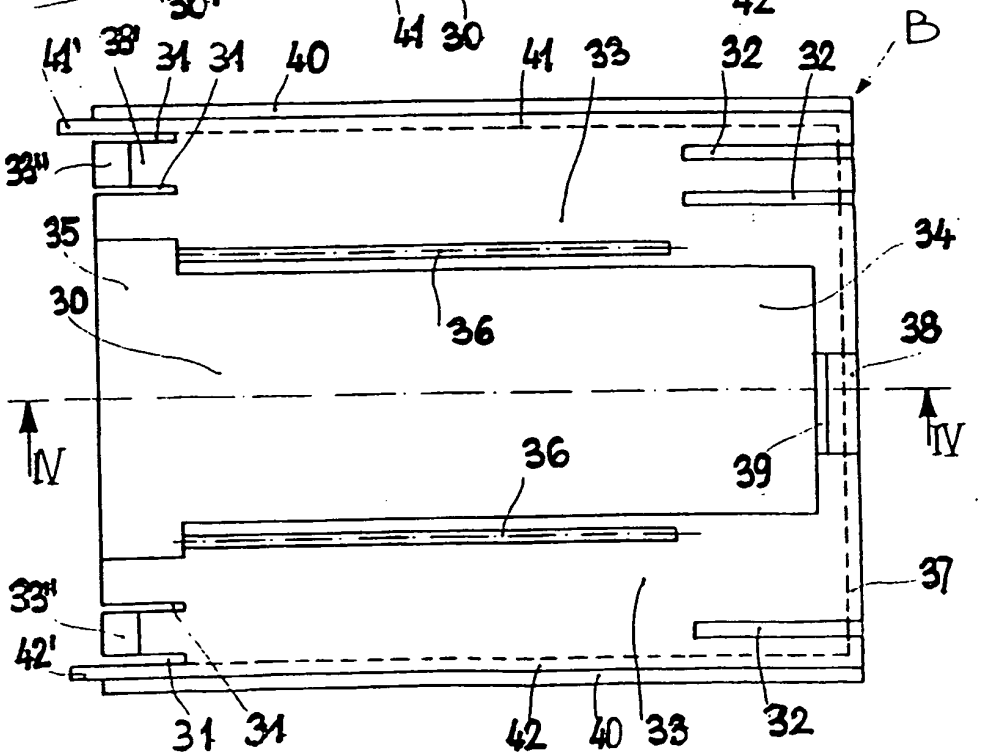


fig. 6

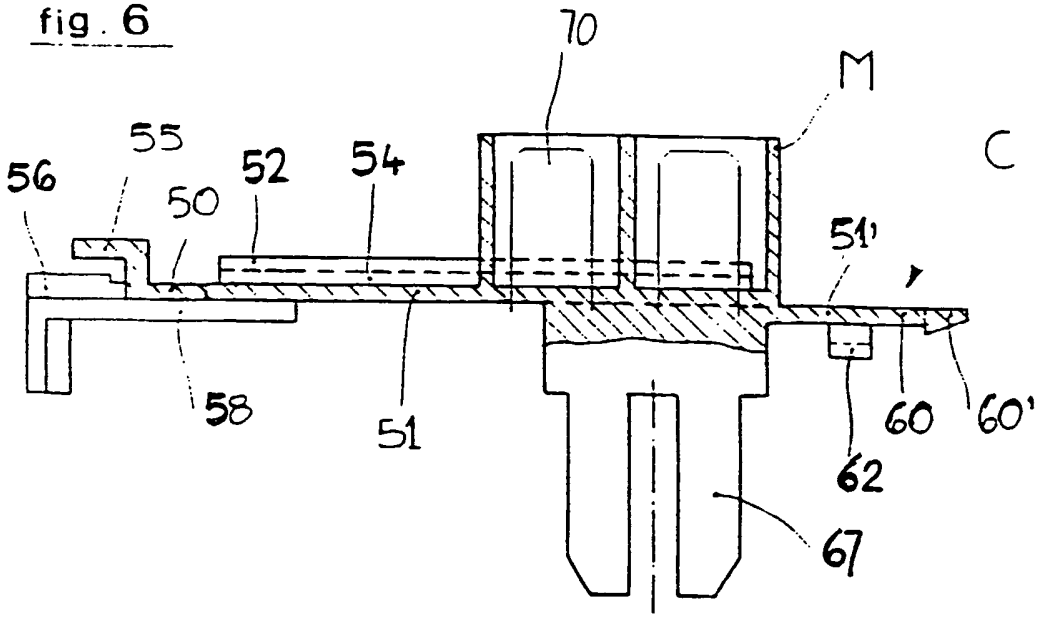

70
M
C
55
56
52
54
50
51'
58
51
60
60'
62
67

fig. 7

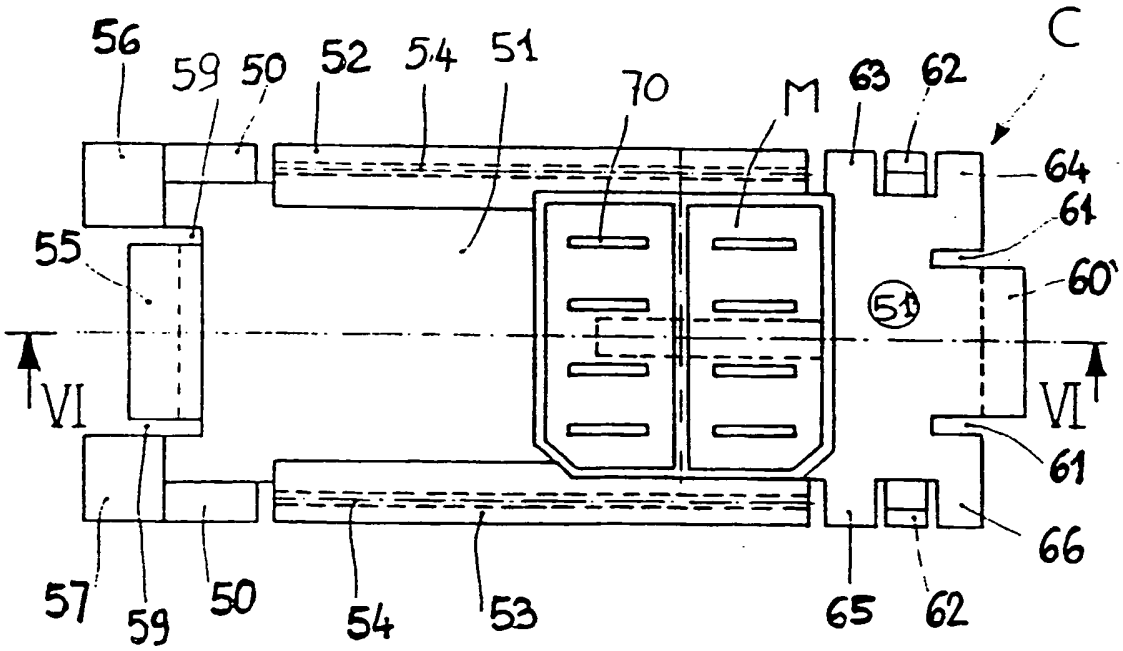

56
59
50
52
54
51
70
M
63
62
C
64
61
55
60'
51
VI
VI
61
66
57
59
50
54
53
65
62

fig. 8

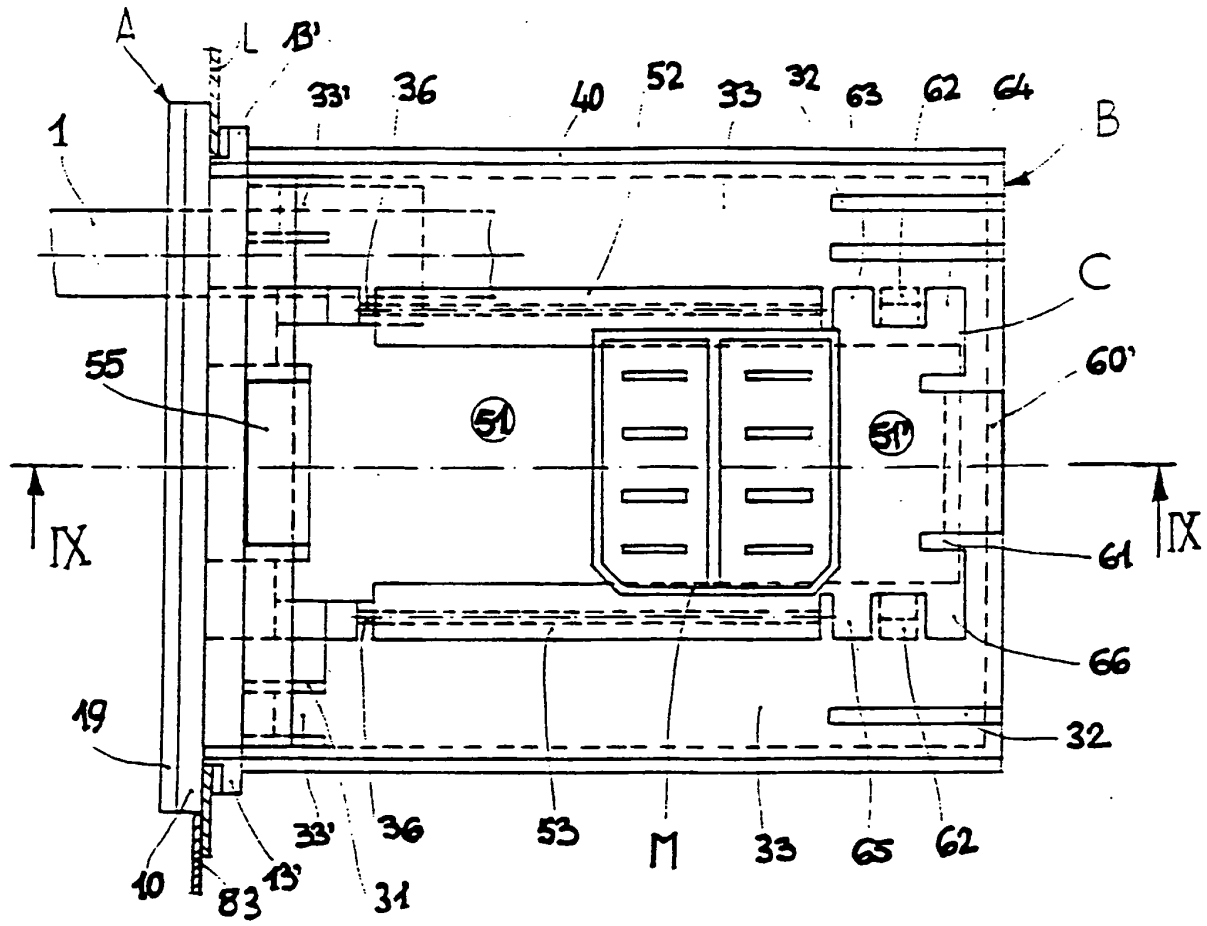

A
L
13'
33'
36
40
52
33
32
63
62
64
B
1
C
55
60'
51
51'
IX
IX
61
66
19
32
10
83
13'
33'
36
31
53
M
33
65
62

fig. 9

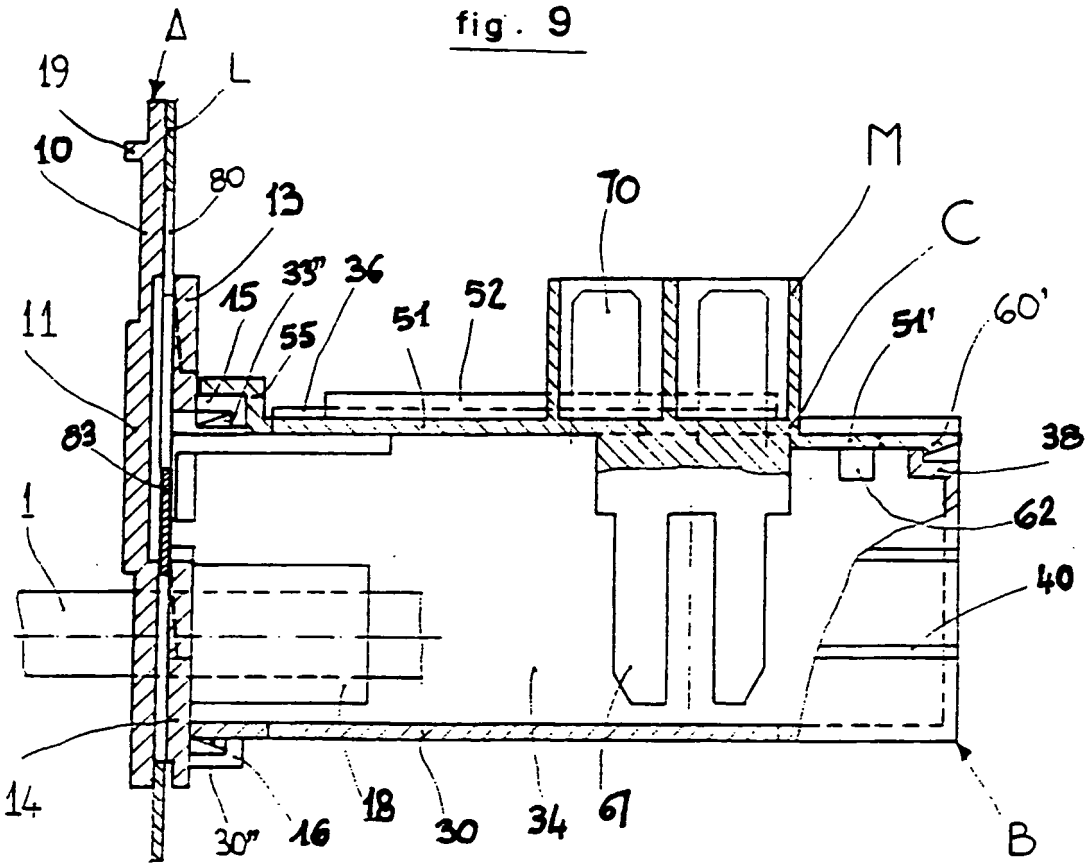

A
19
L
10
80
13
M
70
C
15
33"
36
51
52
51'
60'
11
55
38
83
1
62
40
14
30"
16
18
30
34
67
B

fig. 10

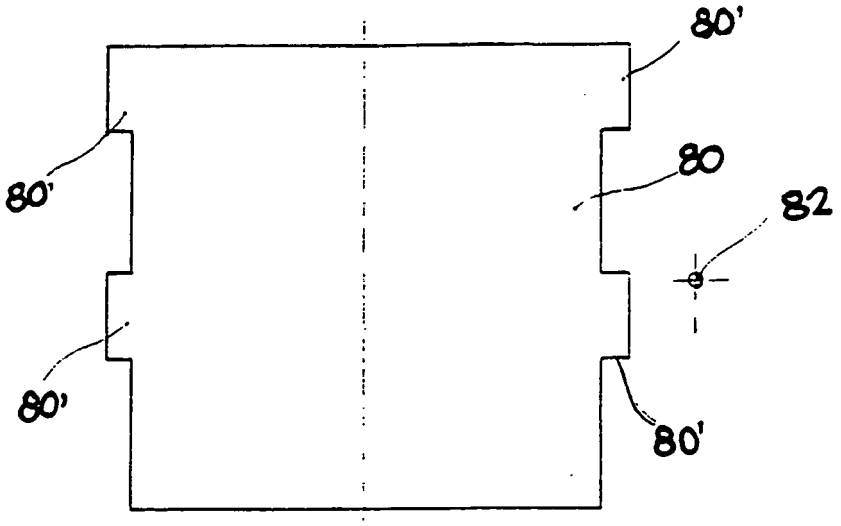


fig. 11

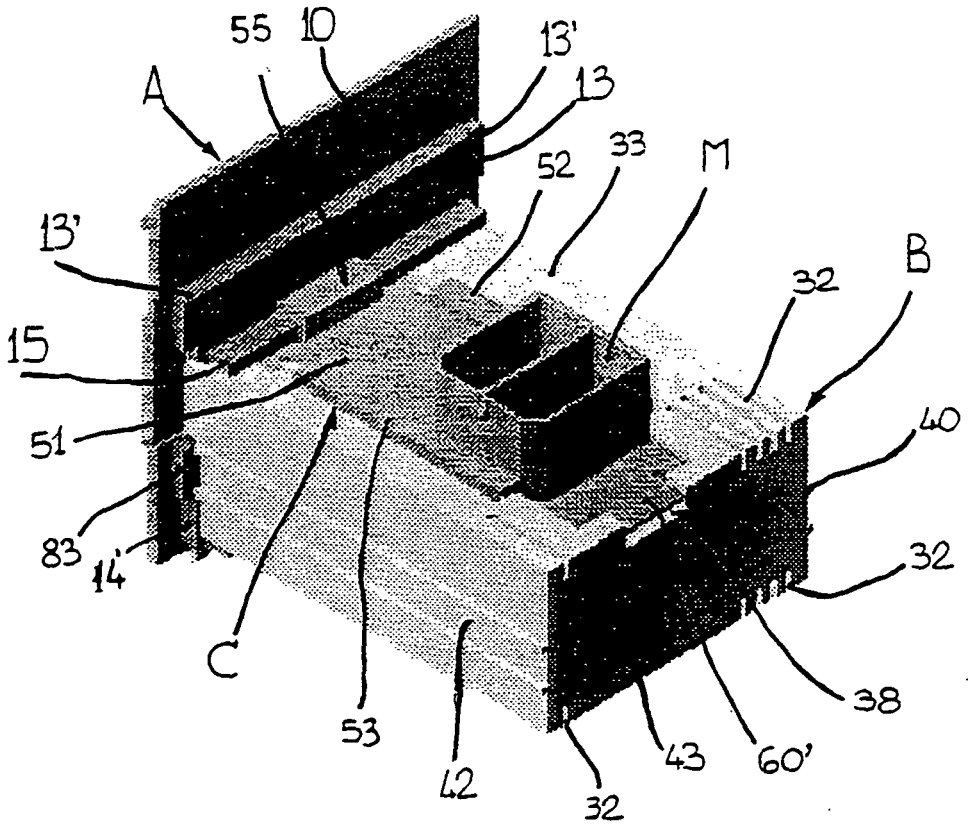


Fig. 12

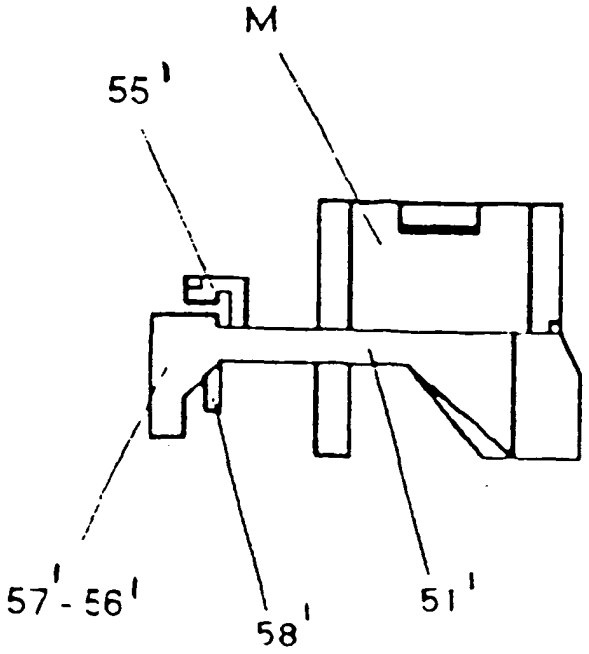


Fig. 13

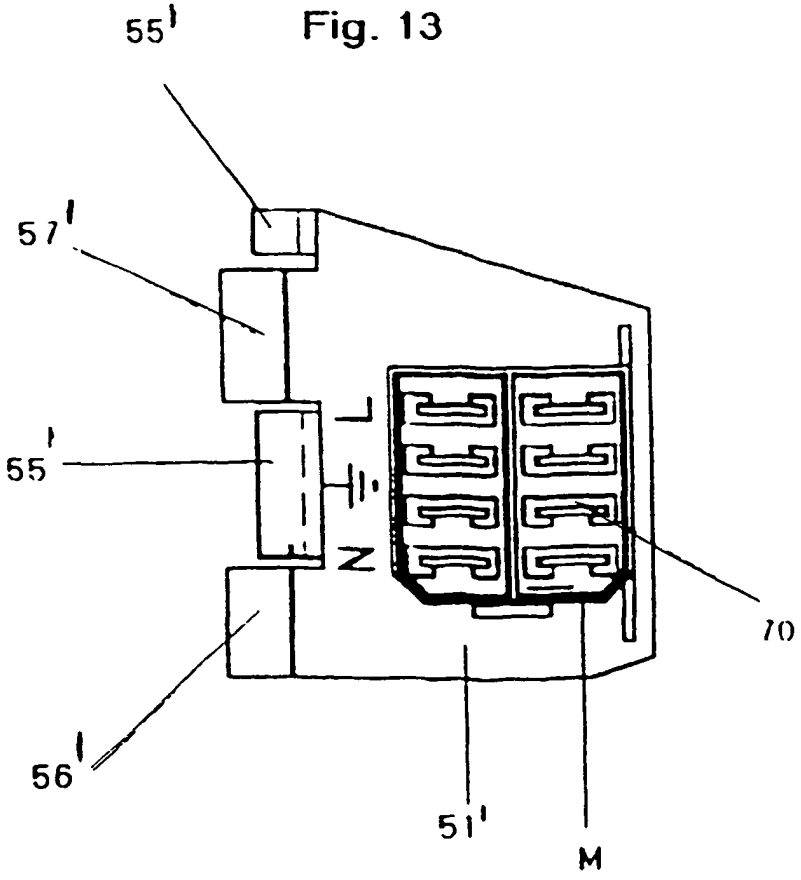


Fig. 14

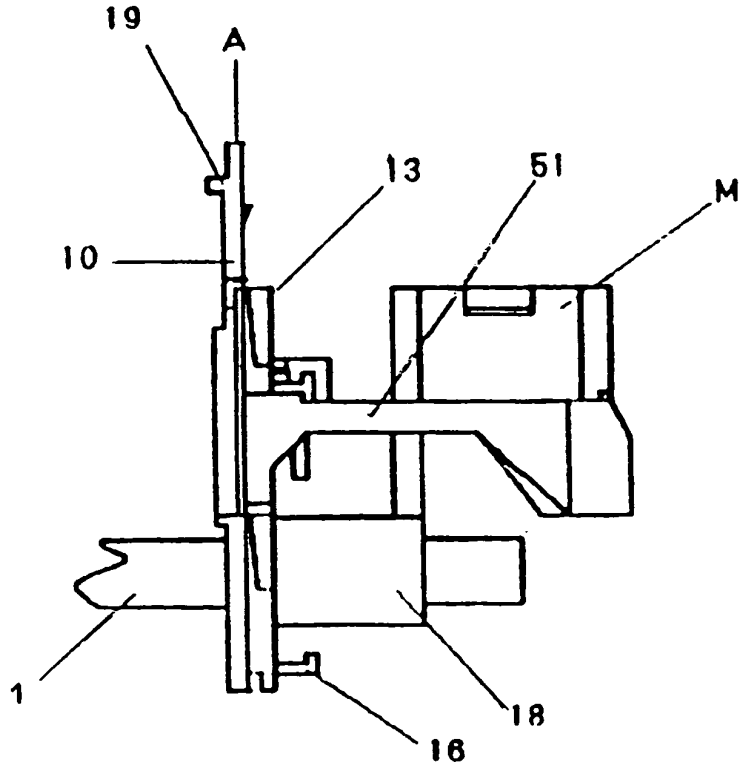
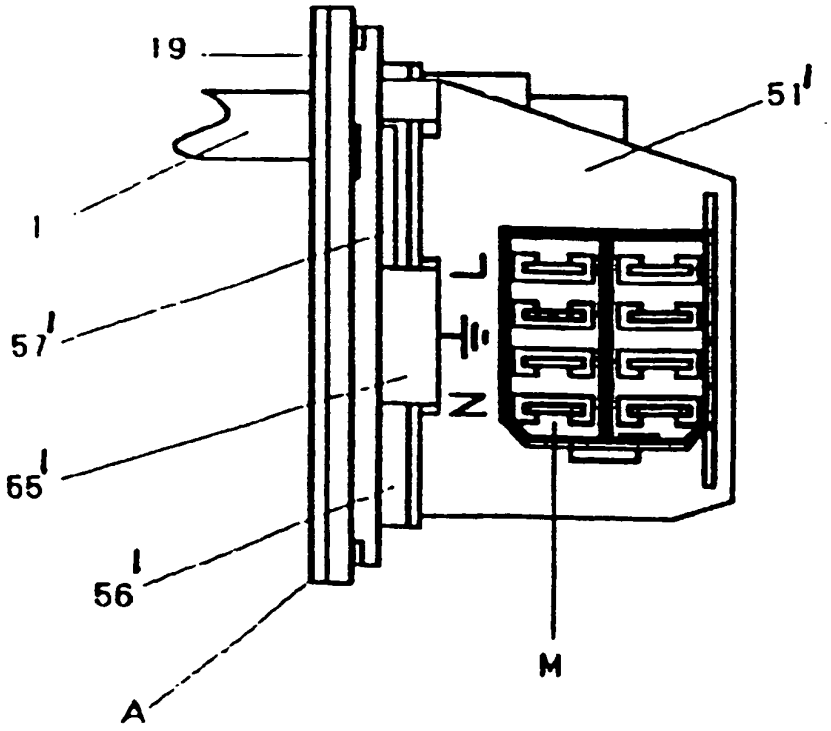


Fig. 15



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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