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(54) Terminal block and integrated motor housing cap and terminal block holder

(57) A locating assembly comprising a terminal block (12) and a terminal block holder (14) locates electric terminals (46) of an electric device (16) mounted in the terminal block (12) relative to a housing section (20) of the electric device (16) and also covers an opening (32) in a casing (30) of the electric device (16). The block holder (14) holds the terminal block (12) in a position relative to the housing section (20) where the electric terminals (46) mounted on the terminal block (12) will project through an opening (26) provided for the terminals (46) in the housing section (20) when the housing section (20) is assembled to the electric device (16). The block holder (14) also covers an opening (32) in the casing (30) of the electric device (16) and protects wiring of the electric device (16) extending to the terminal block (12) from contacting edges (36) of a metal end cap of the device casing (30).

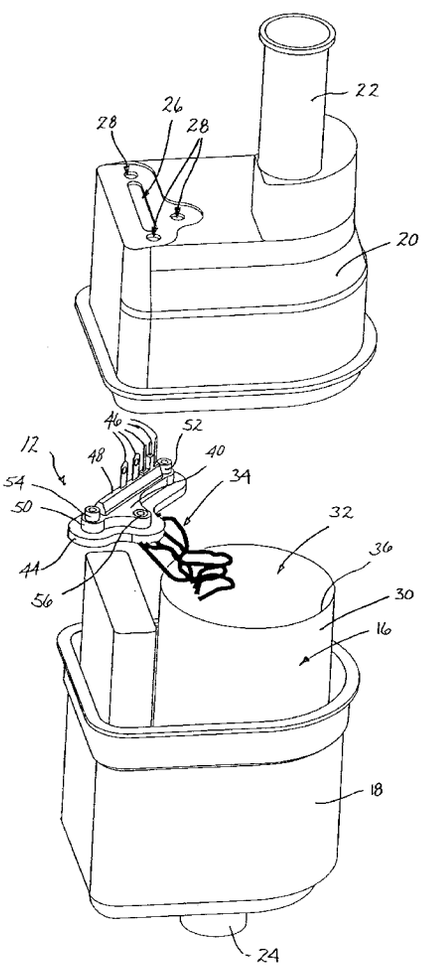

FIGURE 1

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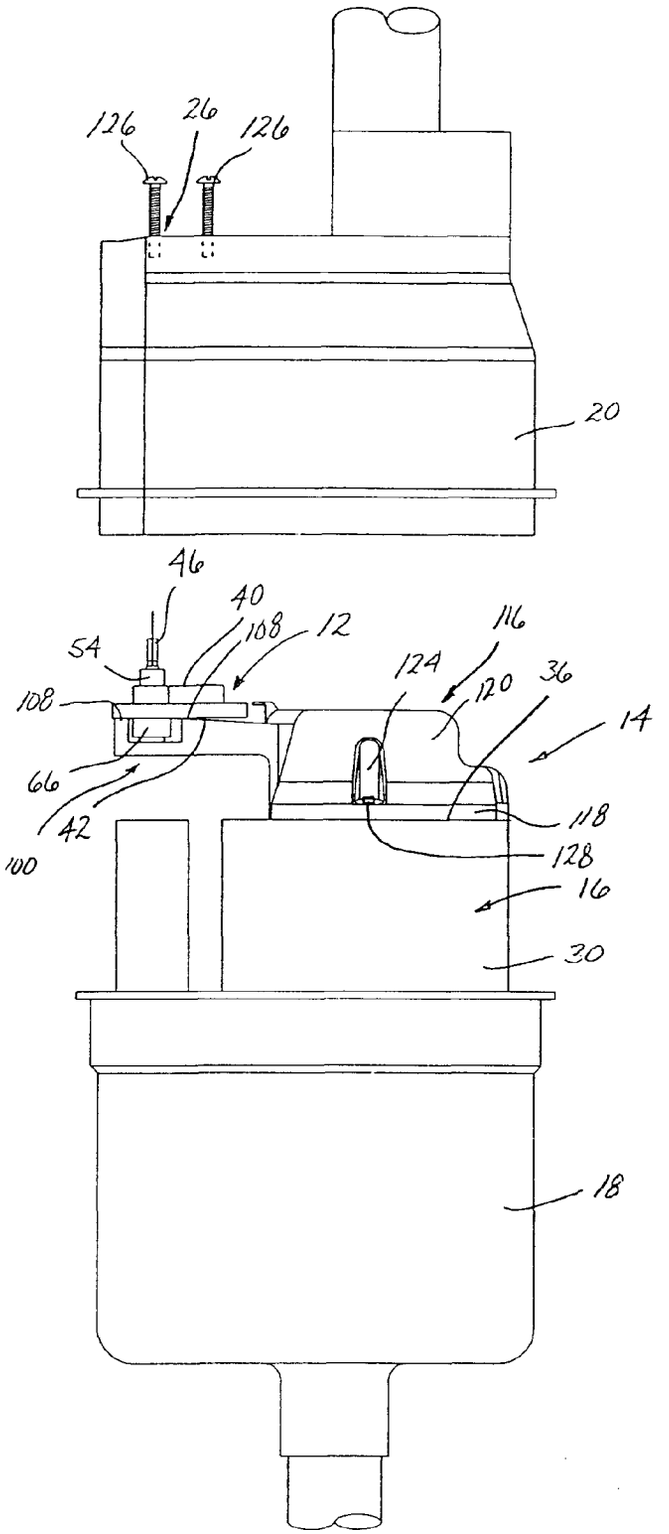
126
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18

FIGURE 10

Description

Background of the Invention

(1) Field of the Invention

[0001] The present invention pertains to a locating assembly comprising a terminal block holder that locates a terminal block of an electrical device relative to a housing section of the electrical device and also covers over an opening in a casing of the electrical device. The block holder holds the terminal block in a position relative to the housing section where electric terminals mounted on the terminal block will project through an opening provided for the terminals in the housing section when the housing section is assembled to the electric device. The block holder also positions the terminal block relative to the electrical device where it can be easily accessed by automated testing equipment prior to assembly of the housing section on the electrical device The block holder also covers an opening in the casing of the electric device and protects wiring of the electric device extending to the terminal block from contacting edges of a metal end cap of the device casing.

(2) Description of the Related Art

[0002] Many different types of electrical devices have loose electrical wiring extending from the devices. Electric terminals are commonly provided at the distal, free ends of the wiring. The terminals are usually mounted in some manner to the protective housing of the electrical device where they are accessible from the exterior of the housing for connection to other electrical conductors. One manner in which electrical terminals are mounted to a housing is through the use of a terminal block that is itself mounted to the housing. For example, the electric terminals, such as male or female plug type terminals, are mounted in a terminal block that positions the terminals relative to each other. Frequently the terminal block is molded plastic and the electric terminals are molded into the plastic of the terminal block with the electric terminals projecting from one side of the block and the loose wiring extending from the opposite side of the block. The block itself may have a configuration formed into the block that enables it to be snap fit to the housing section to be assembled on the electrical device. For example, the housing section could be provided with a hole dimensioned to receive the terminal block in a snap fit connection, thereby supporting the terminal block with the electrical terminals projecting from the exterior of the housing section where they are accessible for connection to other electrical connectors.
Alternatively, the housing section could be provided with an opening for receipt of the terminal block and openings for fasteners, such as threaded fasteners, that would be used to hold the terminal block in its opening where the electric terminals are accessible from the exterior of the housing section for connection to other electrical conductors.

[0003] A disadvantage commonly experienced in these prior art types of mountings of electrical terminals is that they are difficult to manually assemble and are not conducive to automated assembly, for example by robotics.

[0004] In manually assembling a terminal block to a housing section in the prior art, it was necessary for the assembler to insert the terminal block through the interior of the housing section and into the opening provided in the housing section for the terminal block. The terminal block would either be snap fit into the opening, or manually held in the opening while the assembler inserted screw-threaded fasteners through holes in the housing section and through complimentary screw-threaded holes in the terminal block in order to fasten the terminal block to an interior surface of the housing section with the block positioned in the housing section hole and the electric terminals projecting through the hole to the exterior of the housing section. This assembly was often made more difficult by the lengths of the loose wiring connecting the electrical terminals of the terminal block to the electrical device. For cost savings and to reduce electromagnetic interference (EMI), the electric wiring length is usually kept at a minimum. This limits the extent to which the terminal block could be extended from the electrical device in manually inserting the terminal block through the interior of the housing section and positioning the terminal block in the housing section opening.

[0005] In addition, many electrical devices are enclosed within metal enclosures for their protection. The loose wiring extending to the terminal block of the device would extend through an opening in the metal enclosure. In manually extending the loose wiring of the electrical device through the interior of the housing section, often the electrical wiring would be pulled against or rubbed against an edge of the opening in the metal enclosure of the electrical device. This could result in scraping or cutting away insulation from the electrical wiring and creating the possibility of a short in the electrical device when later used.

[0006] These disadvantages of the prior art could be overcome by an assembly that positions the electrical terminals of an electrical device relative to the electrical device where the terminals will align with an opening in a housing section of the electrical device as the housing section is assembled to the electrical device while protecting the loose wiring that leads to the terminals from contacting metal edges of the device casing. With the assembly holding the terminal block relative to the opening in the housing section, both hands of the assembler would then be free to insert screw-threaded fasteners through holes in the housing section and into complimentary internally threaded holes in the terminal block to attach the terminal block to the housing section, thus greatly simplifying assembly of the terminal block to the housing section and the housing section to the electrical

device.

Summary of the Invention

[0007] The present invention is a locating assembly that is used in positioning electric terminals connected by loose wiring to an electrical device relative to an opening in a housing section of the electrical device. The assembly is basically comprised of a terminal block to which the electric terminals are fixed, and a block holder that is adapted to be attached to the electrical device.

[0008] The terminal block is preferably molded of plastic. The electric terminals of the device, whether one or more in number, are molded in the terminal block with the electric terminal projecting from one side of the terminal block and the loose wiring extending from the opposite side of the-terminal block to the electrical device. In addition, metal connectors are molded in the plastic of the terminal block on opposite sides of the electric terminal or terminals. The connectors have internal screw-threading on the side of the terminal block from which the terminals project, and are provided with cylindrical collars on the opposite side of the terminal block.

[0009] The block holder is also preferably molded of plastic and includes a base having a shape adapted to be attached to the electrical device and a clamp having a pair of arms that project from the base. The base interior surface is configured to cover over an opening in the electrical device from which the loose wiring extends. The exterior of the base has a metal cap attached thereto. The metal cap is actually attached to the metal enclosure of the electrical device, securing the base between the opening of the electrical device enclosure and the metal cap. With the plastic of the base positioned between the loose wiring extending from the electrical device and the metal cap over the base, the base insulates and protects the insulation of the loose wiring from exposed metal edges of the cap.

[0010] The metal cap extends around the projecting pair of arms of the block holder clamp. The pair of arms have a spacing therebetween that is sufficiently large to enable the terminal block to be pressed between the pair of arms. The resiliency of the plastic arms enables them to flex a slight distance away from each other, enabling the pair of collars extending from the bottom surface of the terminal block to be press-fit between the pair of resilient arms. With the collars positioned between the pair of arms, the arms hold the terminal block in a stationary position relative to the base and the electrical device to which it is attached. The resiliency of the arms also enables the terminal block to be easily pulled and removed from the pair of arms when subjected to a pulling force.

[0011] With the base of the block holder and its protective metal cap attached to the enclosure of the electrical device, and with the terminal block inserted between the arms of the block holder, the housing section may then be assembled to the enclosure of the electrical device. Also, before the housing section is assembled to the enclosure the block holder positions the terminal block relative to the enclosure where it can be easily accessed for automated testing of the electrical device. As the housing section is assembled to the electrical device, the block holder positions the terminal block relative to the housing section so that the electrical terminals will protrude through an opening in the housing section provided for the terminals. In addition, two or more fastener holes are provided in the housing section that align with the internally screw-threaded holes of the terminal block connectors when the housing section is assembled to the electrical device.

[0012] The block holder of the locating assembly is dimensioned so that, when the housing section is assembled to the electrical device, the terminal block is releasably held by the block holder arms just below the opening in the housing section provided for the terminal block with the electric terminals extending through the opening. By inserting externally threaded fasteners through the fastener holes of the housing section and into the internally screw-threaded holes of the terminal block, turning the threaded fasteners will exert a pulling force on the terminal block. By continued turning of the threaded fasteners, the terminal block is pulled and released from the pair of arms of the block holder and is secured against the interior surface of the housing section with the electric terminals projecting through the opening in the housing section to the exterior of the housing section where they may be connected to other electrical conductors.

[0013] The locating assembly of the invention thereby provides a method by which a terminal block may be easily connected to the interior surface of a housing section after the housing section has been assembled to the electrical device of the terminal block, thereby significantly facilitating the manual assembly of the terminal block into the housing section and making it possible for such assembly to be automated. In addition, the terminal block holder positions the terminal block relative to the electrical device where it can be easily accessed by automated testing equipment prior to the assembly of the housing section to the electrical device.

Brief Description of the Drawings

[0014] Further objects and features of the present invention are revealed in the following detailed description of the preferred embodiment of the invention and in the drawing figures wherein:

Figure 1 is an exploded, perspective view of an electrical device partially contained in a housing enclosure and a housing section that is attachable to the enclosure of the electrical device, with the terminal block of the invention attached to terminals of the electrical device that are in turn attached to the electrical device by loose wiring;

Figure 2 is a perspective view of the block holder of

the invention;

Figure 3 is a top plan view of the block holder;

Figure 4 is a bottom plan view of the block holder;

Figure 5 is a perspective view of the metal cap for the block holder;

Figure 6 is a top plan view of the terminal block of the invention;

Figure 7 is a bottom plan view of the terminal block;

Figure 8 is a side elevation view of the terminal block;

Figure 9 is a plan view of the bottom of the block holder and the bottom of the terminal block attached to the block holder;

Figure 10 is an exploded view similar to that of Figure 1 with the block holder releasably holding the terminal block;

Figure 11 is a perspective view of the housing section showing the terminal block secured in place on the housing section; and

Figures 12-14 show enlarged, partial views of details of the terminal block holder construction.

Description of the Preferred Embodiment

[0015] The locating assembly of the present invention is basically comprised of a terminal block 12 and a block holder 14. Together, the terminal block 12 and block holder 14 are used in positioning electric terminals connected by loose wiring to an electric device relative to the electrical device to facilitate the insertion of the electric terminals through a hole provided for the terminals in a housing section while the housing section is attached to the electric device. Figure 1 illustrates one possible environment in which the locating assembly may be employed. Although this illustrative embodiment is disclosed and will be referred to in the following description of the locating assembly and its method of use, it should be understood that the locating assembly of the invention may be used in a variety of different housing enclosures where it is desired to positively position and locate one or more electric terminals relative to an electric device to facilitate the insertion of the terminals through an opening in a housing section provided for the terminals, as the housing section is assembled to the enclosure of the electric device. In Figure 1, an electric device 16 is shown already mounted in a portion of a housing enclosure 18 with a second housing section 20 positioned to be assembled to the enclosure 18 to completely enclose the electric device 16. In the illustrative environment shown, the electric device 16 is an electric motor that powers a power steering fluid pump of a vehicle. The housing section 20 is assembled to the housing enclosure 18 to hermetically seal the electric device 16 within the enclosure.

[0016] The housing section 20 is provided with an oblong opening 26 dimensioned to accommodate the electric terminals to be described, and three fastener openings 28 arranged around the terminal opening 26. The electrical device 16 contained within the housing enclosure 18 is further surrounded by a cylindrical casing 30. The top of the casing 30 as viewed in Figure 1 is uncovered, exposing an opening 32 to the interior of the casing. Where the casing 30 encloses an electric motor that powers a pump as in this illustrative environment, the opening 32 exposes the stator windings of the motor. In this illustrative embodiment, the electrical device 16 is represented only generally and the details of a stator winding visible through the casing opening 32 are not shown in order to simplify the description of the invention. However, it should be understood that the loose wiring 34 shown extending through the casing opening 32 would be comprised of the various different types of electrical conductors that communicate the electric motor, or some other type of electrical device, to other electrical conductors (not shown) that are external to the electrical device 16.

[0017] In the prior art, a metal endcap would be attached to the top edge 36 of the casing 30 covering the opening 32. The endcap usually has an aperture through which the loose wiring 34 of the motor extends. Often, in attaching the prior art terminal block to the interior of the housing section 20, the loose wiring 34 would rub against the edge of the endcap aperture possibly scraping or cutting the insulation of the wiring away and creating a possible location for an electrical short in the wiring.

[0018] The features of the electrical device 16, its enclosure 18 and housing section 20 described above are typical and are intended to be illustrative only. Again, it should be understood that the locating assembly of the present invention may be employed with a variety of different electric devices that are enclosed within a closure and have electric terminals that are positioned in an opening of a housing section to electrically connect the electric device to conductors that are external to the device.

[0019] The terminal block 12 is shown connected to the loose wiring 34 of the electric device 16 in Figures 1, 7 and 9, and is shown separated from the loose wiring in Figures 6 and 8. The terminal block 12 is preferably molded of plastic and has a top surface 40, a bottom surface 42 and a peripheral edge 44. In the illustrative embodiment, the housing section 20 to which the terminal block will be attached has three fastener holes 28 and an oblong opening 26 for a plurality of electrical terminals. These features of the housing section 20 construction influence the construction of the terminal block 12 which is complimentary to the construction of the housing section to which it will be attached. Five electrical terminals 46, in this case all male terminals, are molded into the plastic of the terminal block 12. The terminals 46 are all spacially arranged in a line providing sufficient spacing between each terminal to enable its connection to a complimentary female terminal without adjacent female terminals contacting each other. The terminals are all securely molded into a plastic founda-

tion 48 that projects upwardly from a plastic footing 50 that in turn projects above the peripheral edge 44 of the terminal block. This particular molded plastic construction securely holds each of the electric terminals 46 in the terminal block 12. Bottom ends of the electric terminals 46 project from the bottom surface 42 of the terminal block 12. The terminal bottom ends are connected to the loose wiring 34 of the electrical device 16 by female connectors press-fit over the bottom ends, by soldered connections, or by any other known type of connection.

[0020] Three metal cylindrical collars 52, 54, 56 are also molded into the plastic of the terminal block 12. Two of the collars 52, 54 are positioned on opposite sides of the row of electric terminals 46 and the third collars 56 is positioned off to one side of the electrical terminals. As best seen in Figures 1 and 8, the top ends of these three collars, 52, 54, 56 project from the terminal block footing 50 above the top surface 40 of the terminal block. The positioning of the three collars 52, 54, 56 on the terminal block 12 corresponds to the positions of the three fastener holes 28 in the housing section 20. Therefore, if the fastener holes 28 were fewer in number, or if their positions were arranged differently than that shown in Figure 1, the number and positions of the collars would be changed accordingly. Each of the three collars 52, 54, 56 have internal screw-threading 58, 60, 62 to receive externally threaded fasteners inserted through the fastener holes 28 of the housing section 20 as will be explained. The two collars 52, 54 positioned at the opposite ends of the row of electric terminals 46 extend completely through the terminal block 12 and project from a pair of plastic columns 64, 66 on the bottom surface 42 of the terminal block. A third plastic column 68 projects downwardly from the terminal block bottom surface 42 and the bottom of the third metal collar 56 is encapsulated in and insulated by the third plastic column. The bottom portions 70, 72 of the two metal cylindrical collars 52, 54 have necked down portions 74, 76 that leave annular rims at the opposite top and bottom ends of the necked down portions. These necked down portions 74, 76 are employed in releasably attaching the terminal block 12 to the block holder 14 as will be explained.

[0021] The block holder 14 is shown in Figures 2-4. The block holder 14 includes a base 82 and a clamp projecting from the base, the clamp being formed by two projecting arms 84, 86. The base 82 and projecting arms 84, 86 are molded as one, monolithic piece of plastic.

[0022] The bottom of the base has a peripheral edge band 88 that extends from one of the arms 84 around the base to the other arm 86. The edge band 88 is given a configuration that is complimentary to the top edge 36 of the electrical device casing 30 surrounding the exposed opening 32 of the electrical device, but is slightly smaller so that the base peripheral edge band 88 will be received just inside the top edge 36 of the casing with the base 82 covering over the opening 32. Just above the peripheral edge band 88 are four tabs 92 that project outwardly from the edge band. These four tabs engage with the top edge 36 of the electrical device casing when the base is inserted on the casing over the casing opening 32, thereby preventing the base 82 from passing through the casing opening 32. Additional hooks 90 shown in Figures 12-14 are provided that engage over the top edge 36 of the casing and ensure the base stays in place on the top edge 36 of the casing. Above the peripheral band 88 the base has a dome portion 94 that covers over the casing opening 32 when the base is attached to the casing opening. Several openings 96 pass through the dome portion. These openings 96 are provided for drainage of a cleaning liquid flushed through the electric device following its assembly. Three indents 98 are provided in the peripheral band 88 and the dome portion 94 just above the peripheral band.

[0023] The pair of projecting arms 84, 86 extend outwardly from the dome portion 94 of the base in a cantilever fashion. The arms 84, 86 are elevated slightly above the peripheral band 88 of the base and are positioned in a plane that is parallel to the plane of the base peripheral band. At the distal ends of each arm 84, 86 are couplers 100, 102 that are mirror images of each other. Each coupler includes a ledge 104, 106 recessed below a pair of top lands 108, 110 positioned on opposite sides of each ledge. The pairs of top lands 108, 100 are flat surfaces positioned in the same plane. Each ledge 104, 106 has a notch 112, 114 formed therein, with the pair of notches mutually opposing each other. The notches 112, 114 are spaced from each other by a distance that is slightly smaller than the distance between the necked down portions 74, 76 of the terminal block metal collars 52, 54. The cantilevered projection of the arms 84, 86 from the base 82 of the block holder 14 gives the arms a resiliency that enables the couplers 100, 102 to be flexed slightly away from each other when subjected to a force pushing the arms away from each other, with the resiliency of the arms returning the arms to their at rest positions shown in the drawings 2-4 once the force is removed.

[0024] Figure 5 shows a metal endcap 116 that is positioned over the dome portion 94 and the peripheral edge band 88 of the base 82. As can be seen in Figure 5, the metal endcap 116 has a configuration very similar to that of the block holder base 82. It is provided with a peripheral edge band 118 that fits around the peripheral edge band 88 of the base 82. It is also provided with a dome portion 120 that fits over the dome portion 94 of the base 82. The dome portion also has several openings 122 that correspond to the openings 96 of the base. Three indents 124 are provided in the cap in positions that correspond to the indents 98 of the base. When the endcap 116 is positioned on the block holder 14, it overlies the base 82 and the endcap indents 124 are received in the base indents 98 securing the endcap against movement relative to the base. Each of the indents 124 has a slot 126 that receives a tab 128 project-

ing upwardly from the top edge 36 of the electrical device. The tabs 128 are bent over the edge of the slots 126 to secure the endcap 116 and block holder 14 to the electrical device. The slots 126 and tabs 128 are also used to positively locate the endcap 116 on the electrical device.

[0025] The endcap peripheral band 118 is provided with connectors such as detents (not shown) that will engage in slots (not shown) around the electrical device casing 30 adjacent its top edge 36, or with slots (not shown) that receive detents (not shown) formed in the electrical device casing 30 adjacent its top edge 36. These connectors enable the endcap 116 to be snap-fit over the casing opening 32 onto the electrical device casing 30 around its top edge 36 with the base 82 of the block holder 14 secured between the device casing top edge 90 and the endcap 116. With the end cap so attached to the device casing, the block holder arms 84, 86 project outwardly from beneath the endcap 16.

[0026] Figure 9 is a view beneath the terminal block 12 assembled to the block holder 14. In assembling the terminal block 12 to the block holder 14, the necked down portions 74, 76 of the two metal collars 52, 54 at the opposite ends of the electric terminals 46 are pressed between the couplers 100, 102 of the block holder arms 84, 86. This causes the arms 84, 86 to flex apart from each other allowing the necked down portions 74, 76 of the collars to pass between the ledges 104, 106 of the arms and to engage in the notches 112, 114. The resiliency of the arms 84, 86 clamps or squeezes the necked down portions 74, 76 of the collars between the arms, thus removeably holding the terminal block 12 on the block holder 14. The pairs of top lands 108, 110 of each of the arms 84, 86 engage against the terminal block bottom surface 42 and stabilize the terminal block on the arms. The loose wiring 34 of the terminal block 12 extends beneath the base 82 of the block holder and through the casing opening 32 of the electrical device to its appropriate connections in the electrical device. The plastic of the block holder base 82 insulates the loose wiring 34 from the metal endcap 116 and prevents the metal edges and surfaces of the endcap from rubbing against the insulation of the wiring possibly scrapping or cutting into the insulation and creating an electrical short in the wiring.

[0027] Figure 10 shows the block holder 14 with the terminal block 12 attached, assembled to the electrical device casing 30 by the metal endcap 116. It can be seen in this view that the block holder 14 holds the terminal block 12 in a position where the electric terminals 46 will pass through the terminal opening 26 in the housing section 20 as the housing section is assembled onto the housing enclosure 18 of the electric device. Furthermore, the block holder 14 holds the terminal block 12 in a position where the internal screw-threading 58, 60, 62 of the collars 52, 54, 56 will align with the fastener openings 28 provided in the housing section 20 as the housing section is assembled to the housing enclosure.

[0028] Once the housing section 20 is assembled onto the housing enclosure 18, the terminal block 12 is still held by the block holder 14 with the top surfaces of the terminal block collars 52, 54, 56 spaced a short distance below the interior surface of the housing section 20. Threaded fasteners 126 are inserted through the fastener openings 28 of the housing section 20 and into the internal screw-threading 58, 60, 62 of the terminal block collars 52, 54, 56. Screwing the threaded fasteners 130 into the collar internal screw threading 58, 60, 62 exerts a pulling force on the terminal block 12 that is sufficient to pull it from the block holder arms 84, 86 releaseably holding the terminal block. On continued turning of the threaded fasteners 130, the top surface of the terminal block presses against the interior surface of the housing section 20 with the electric terminals 46 projecting through the terminal opening 26 as shown in Figure 11.

[0029] It can be seen from the description above that the block holder 14 holds the terminal block 12 in a position that facilitates its attachment to the interior surface of the housing section 20 as that section is assembled to the housing enclosure 18, eliminating the need for the terminal block to be manually positioned inside the housing section. With the use of the block holder 14 and terminal block 12, the length of loose wiring 34 can be decreased, with the extra length of wiring needed to manually position the terminal block being no longer needed. Furthermore, with use of the terminal block 12 and block holder 14 of the invention, it is now possible to automate the assembly of the terminal block into the housing section 20 as the housing section is assembled to the housing enclosure 18.

[0030] Again, although the terminal block 12 and the block holder 14 of the invention have been described by reference to an electric device employing an electric motor having five electric terminals connected to the motor by loose wiring, it is emphasized that this environment is illustrative only and the terminal block and the block holder of the invention may be employed in a variety of different environments where it is desirable to facilitate assembling housing sections together while positioning electric terminals in an opening of one or more of the housing sections.

[0031] While the present invention has been described by reference to a specific embodiment, it should be understood that modifications and variations of the invention may be constructed without departing from the scope of the invention defined in the following claims.

Claims

1. A locating assembly for positioning an electric terminal connected by loose wiring to an electric device relative to an opening in a housing of the electric device, the locating assembly comprising:

   a terminal block attached to the electric termi-

nal;

a block holder, the block holder having a base adapted to be attached to the electrical device and a clamp projecting from the base, the clamp being adapted to be removeably attached to the terminal block to hold the terminal block in a position relative to the electric device where the electric terminal will align with the opening of the housing of the electric device.

2. The locating assembly of Claim 1, wherein:

the clamp includes a pair of arms that project from the base and the terminal block is squeezed between the pair of arms, thereby removeably attaching the clamp to the terminal block.

3. The locating assembly of Claim 2, wherein:

the arms are resiliently flexible inwardly toward each other and outwardly away from each other and the resiliency of the arms squeezes the terminal block between the arms.

4. The locating assembly of Claim 3, wherein:

the terminal block has opposite top and bottom surfaces, the electric terminal projects outwardly from the top surface and the loose wiring extends outwardly from the bottom surface.

5. The locating assembly of Claim 4, wherein:

a pair of posts project from the bottom surface of the terminal block and the pair of posts are squeezed between the pair of arms of the clamp thereby removeably attaching the clamp to the terminal block.

6. The locating assembly of Claim 1, wherein:

the base is an end cap adapted to cover over an opening of the electric device that exposes internal electrical components of the electrical device.

7. The locating assembly of Claim 6, wherein:

the clamp includes a pair of arms that project outwardly from the base end cap and squeeze the terminal block between the pair of arms thereby removeably attaching the arms to the terminal block.

8. The locating assembly of Claim 7, wherein:

the base end cap and the pair of arms are monolithically molded of plastic.

9. The locating assembly of Claim 1, wherein:

the terminal block is molded plastic and the electric terminal is molded in the plastic of the terminal block with the electric terminal projecting from one side of the terminal block and the loose wiring extending from an opposite side of the terminal block, and the clamp is also molded plastic and includes a pair of arms that project outwardly from the base with a spacing between the arms, the arms are resiliently flexible and the terminal block is squeezed between the arms by the resiliency of the arms.

10. The locating assembly of Claim 9, wherein:

the terminal block has a pair of shoulders on its opposite side and the arms engage around the shoulders.

11. The locating assembly of Claim 1, wherein:

the terminal block has a connector with internal screw threading that is complimentary to external screw threading of a fastener on the housing of the electric device, and-the clamp is adapted to hold the terminal block in a position relative to the electric device and the housing of the electric device where the external threading of the fastener on the housing will mate with the internal threading of the connector on the terminal block.

12. A locating assembly for positioning an electric terminal connected by loose wiring to an electric device relative to an opening in a housing of the electric device, the locating assembly comprising:

a terminal block molded of plastic around the electric terminal thereby securing the electric terminal to the terminal block;

a block holder having a base and a pair of arms projecting from the base, the base and arms being molded of plastic, the plastic giving the arms a resiliency to deflect from at rest positions with a first spacing between the arms, away from each other to deflected positions with a second spacing between the arms that is larger than the first spacing; and

the terminal block has been inserted between the arms and has moved the arms to their deflected positions with the resiliency of the arms squeezing the terminal block and thereby removeably holding the terminal block to the base.

13. The locating assembly of Claim 12, wherein:

the base of the block holder is adapted to be attached to the electric device and the pair of arms project from the base and removeably hold the terminal block in a position relative to the electric device where the electric terminal will align with and extend through the housing opening when the housing is attached to the electric device.

14. The locating assembly of Claim 13, wherein:

a pair of metal collars having internally threaded holes are molded into the plastic of the terminal block in positions where they align with screw holes in the housing when the housing is attacned to the

electric device.

15. The locating assembly of Claim 13, wherein:
the base of the block holder has a shape adapted to cover over an opening of the electric device that exposes internal electrical components of the electric device and thereby insulates the electrical components from the housing.

16. A method of assembling a housing section on an electric device having an electric terminal connected to the electric device by loose wiring, where the electric terminal extends through an opening in the housing section when the housing section is assembled to the electric device, the method comprising:

securing a terminal block on the electric terminal;
securing a block holder on the electric device, the block holder having a base that is secured to the electric device and a pair of resilient arms that project outwardly from the base;
inserting the terminal block between the pair of arms where the terminal block is squeezed between the arms and thereby held by the arms in a position where the terminal block will align with the opening in the housing section when the housing section is assembled to the electric device; and
assembling the housing section to the electric device while simultaneously aligning the opening of the housing section with the terminal block held by the block holder.

17. The method of Claim 16, further comprising:
inserting at least one threaded screw through a screw hole in the housing section and into a complimentary threaded hole on the terminal block and turning the screw causing it to screw into the threaded hole and causing it to pull the terminal block from the arms of the block holder to a position of the terminal block where it engages against an interior surface of the housing section with the electric terminal extending through the opening in the housing section.

18. The method of Claim 16, further comprising:
securing the terminal block on a plurality of electric terminals.

19. The method of Claim 16, further comprising:
molding the block holder of plastic with the base and the pair of arms being one, monolithic piece of plastic.

20. The method of Claim 19, further comprising:
forming the threaded hole in a metal collar and molding the metal collar into the plastic of the terminal block.

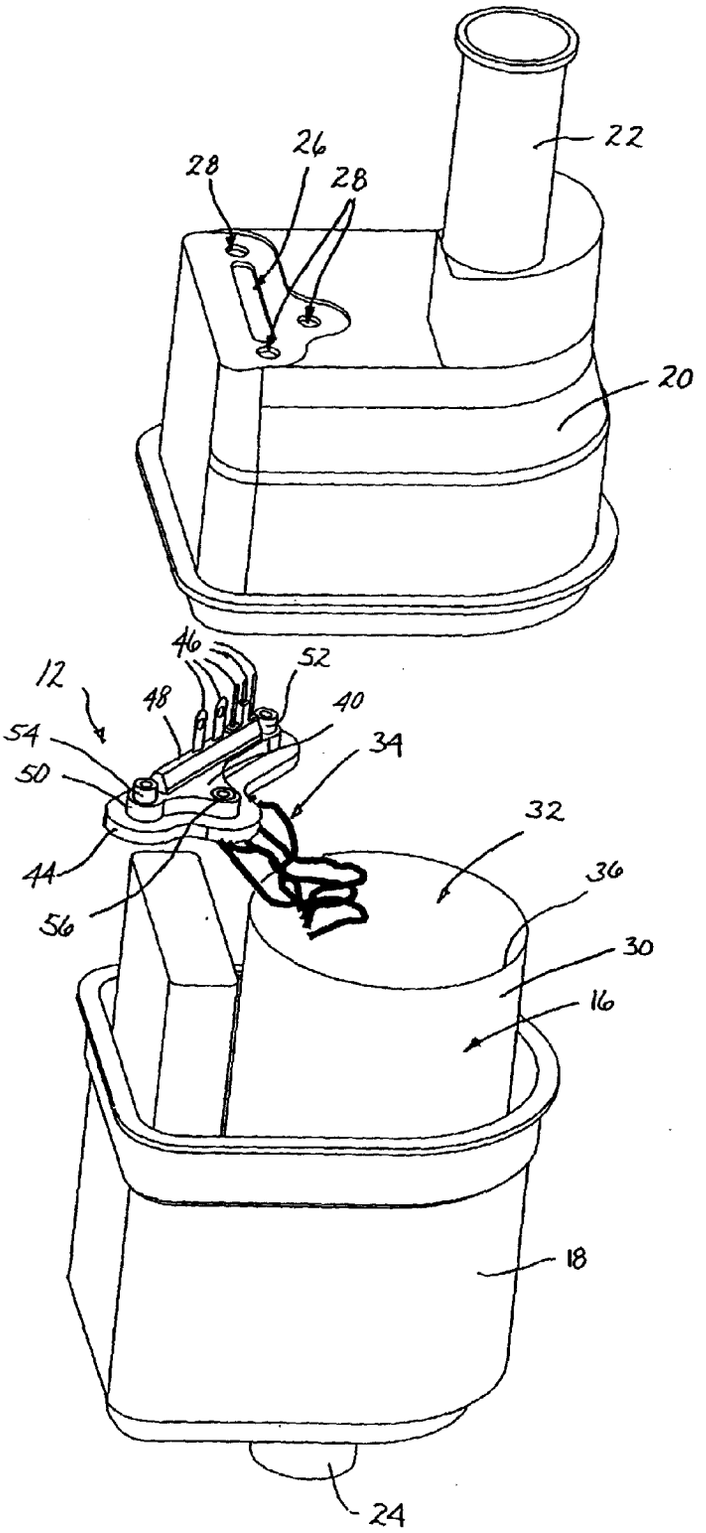


FIGURE 1

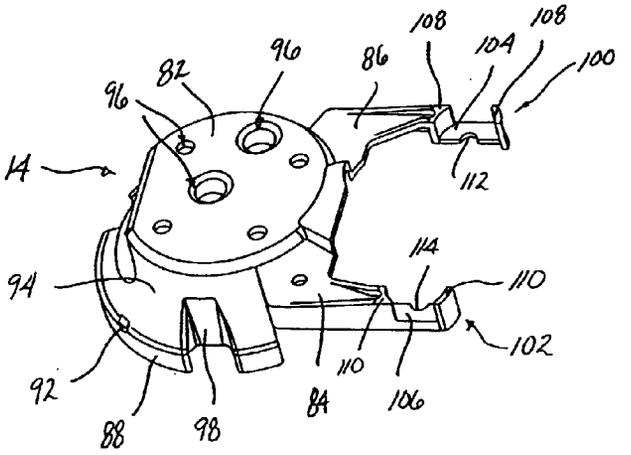


FIGURE 2

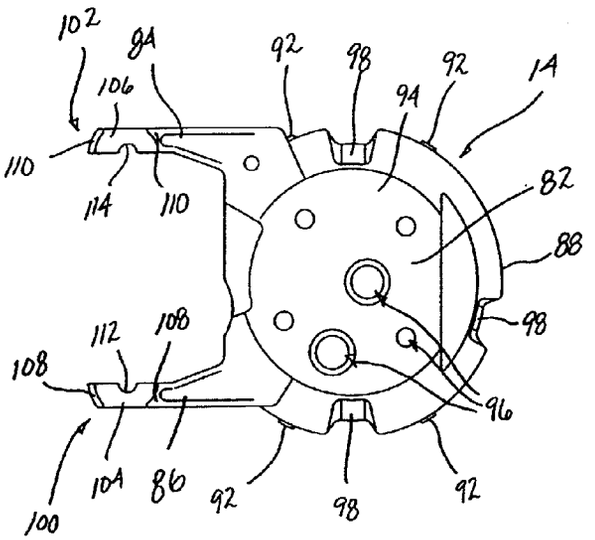


FIGURE 3

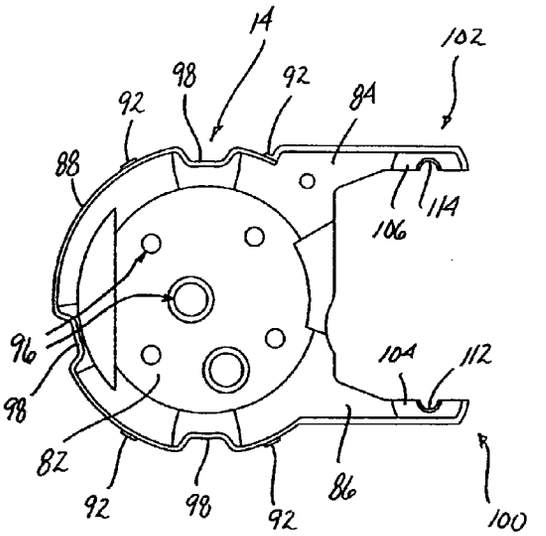


FIGURE 4

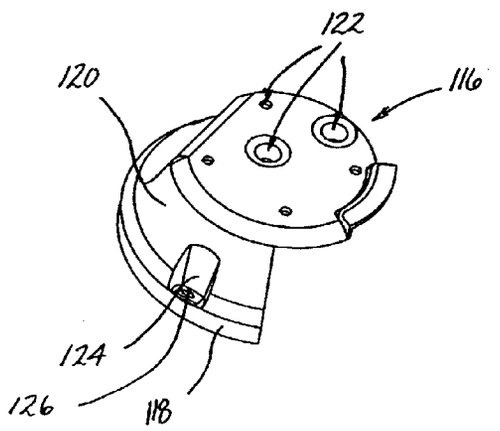


FIGURE 5

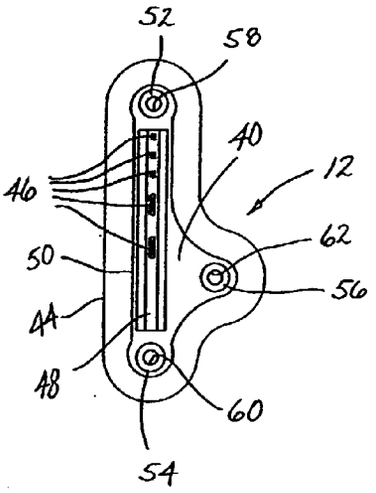


FIGURE 6

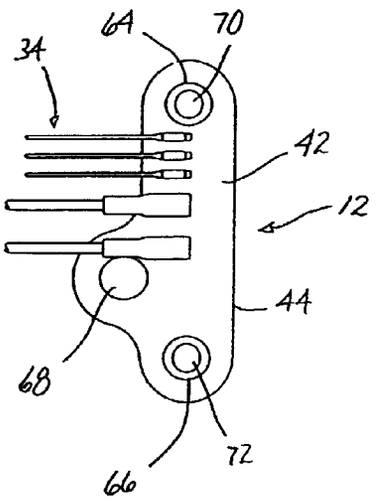


FIGURE 7

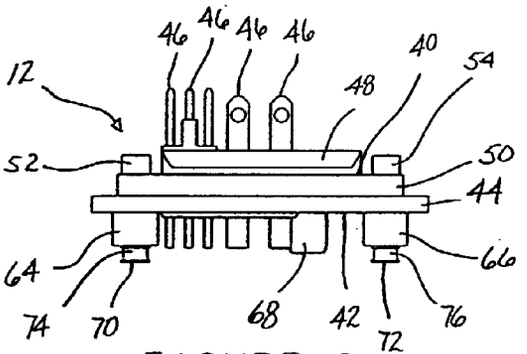


FIGURE 8

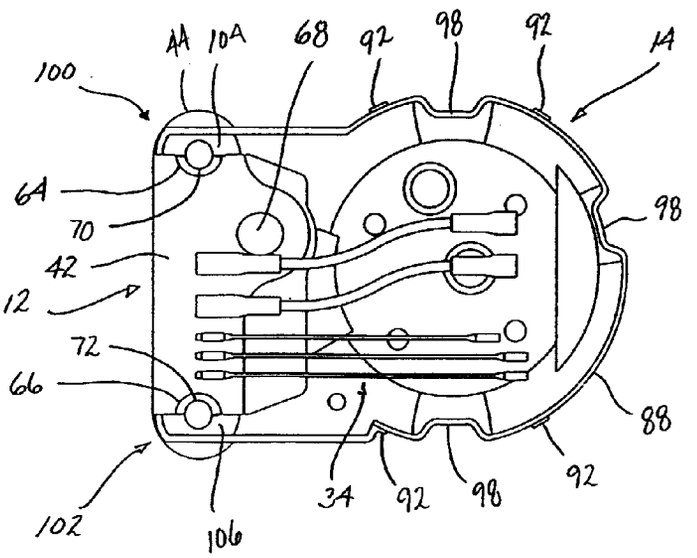
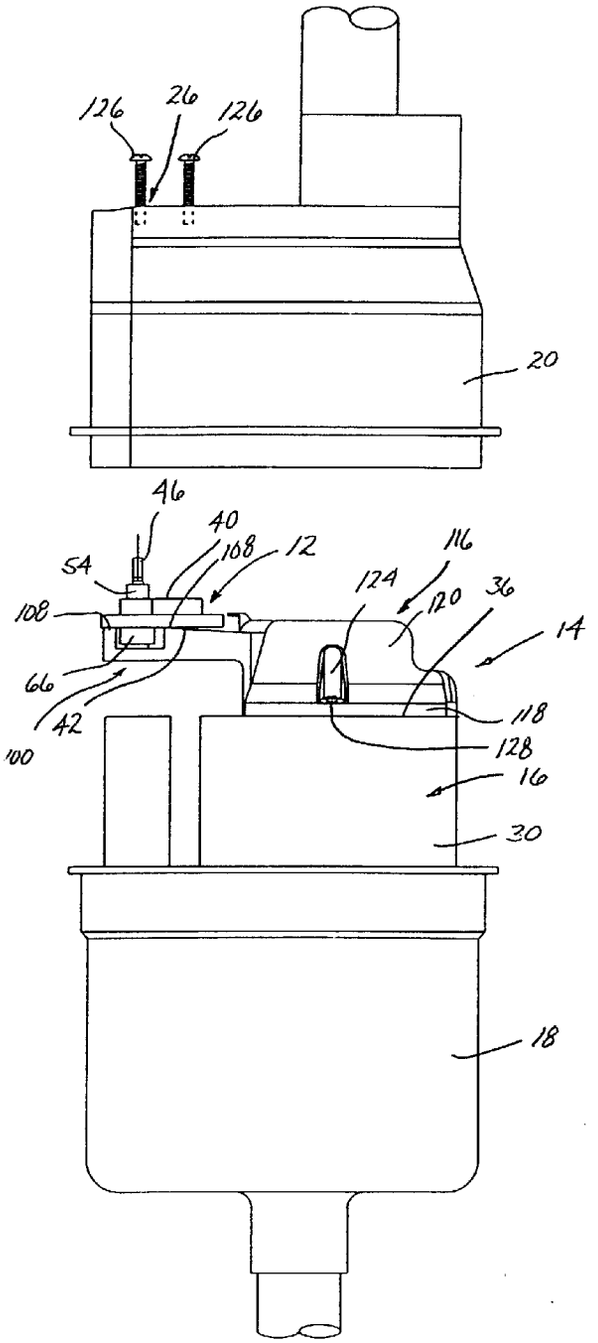


FIGURE 9



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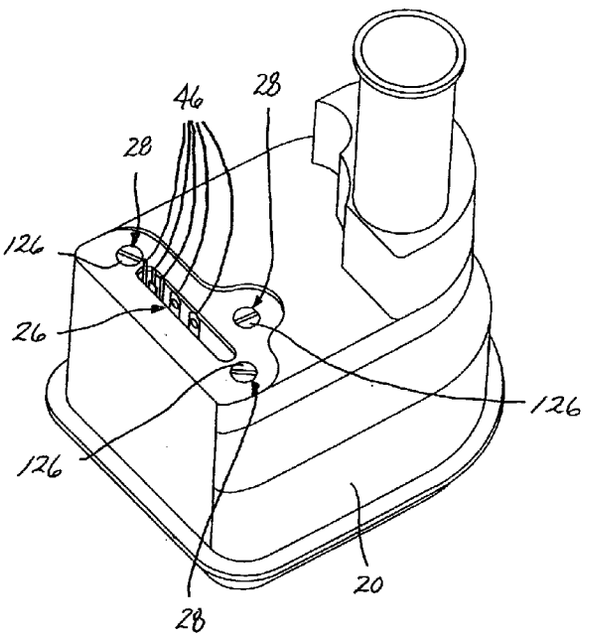

FIGURE 11

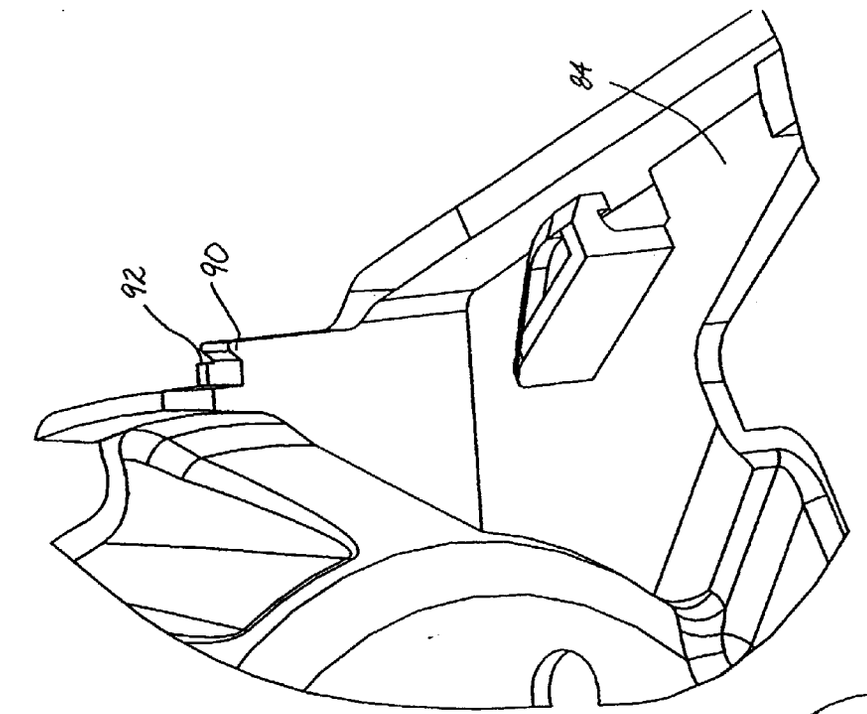

FIGURE 14

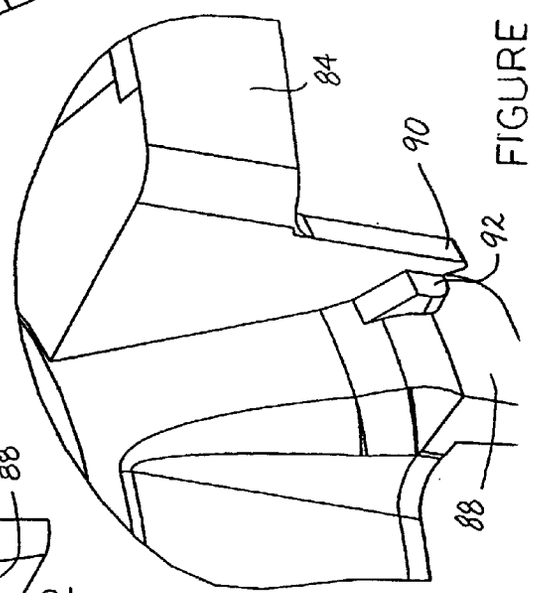

FIGURE 13

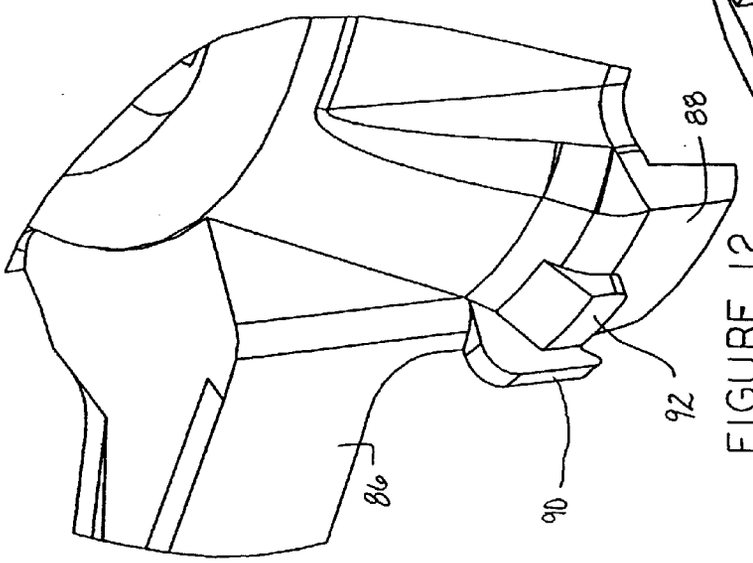

FIGURE 12