Nov. 14, 1967 D. B. MILLER 3,353,137

CURRENT TAP WITH GROUND

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Fig. 1

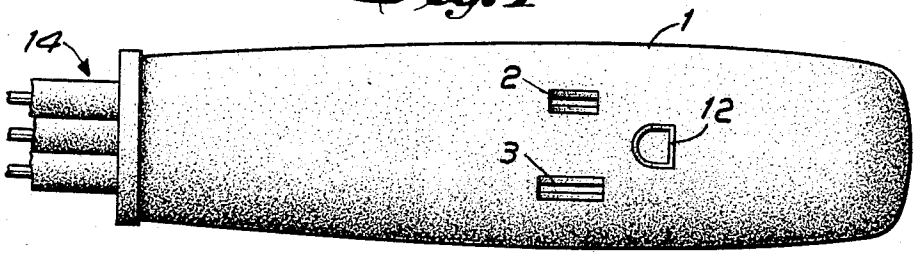


Fig. 2

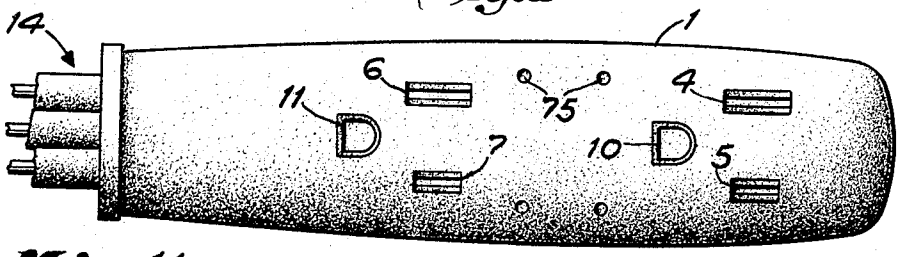


Fig. 11

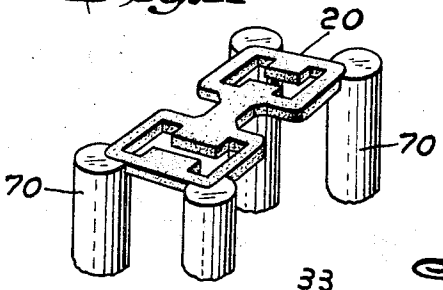


Fig. 12

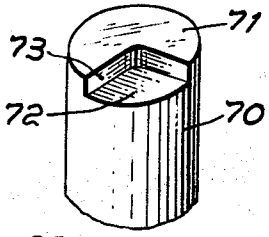


Fig. 5

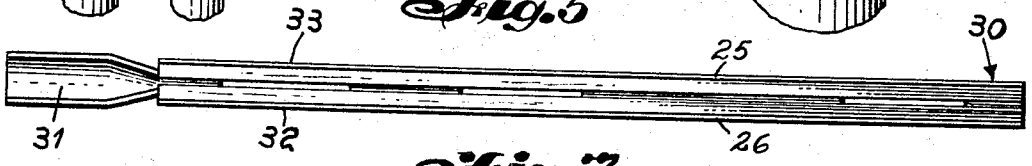


Fig. 7

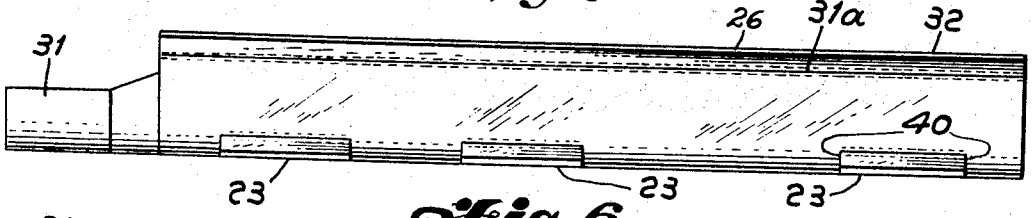
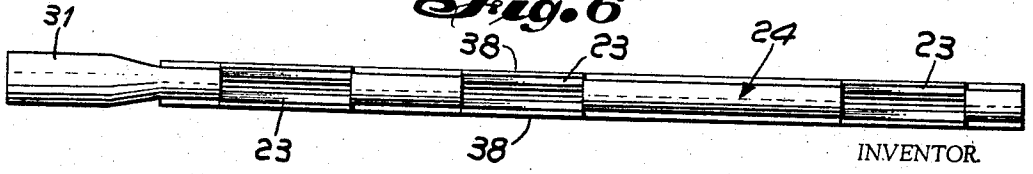


Fig. 6



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Fig. 4

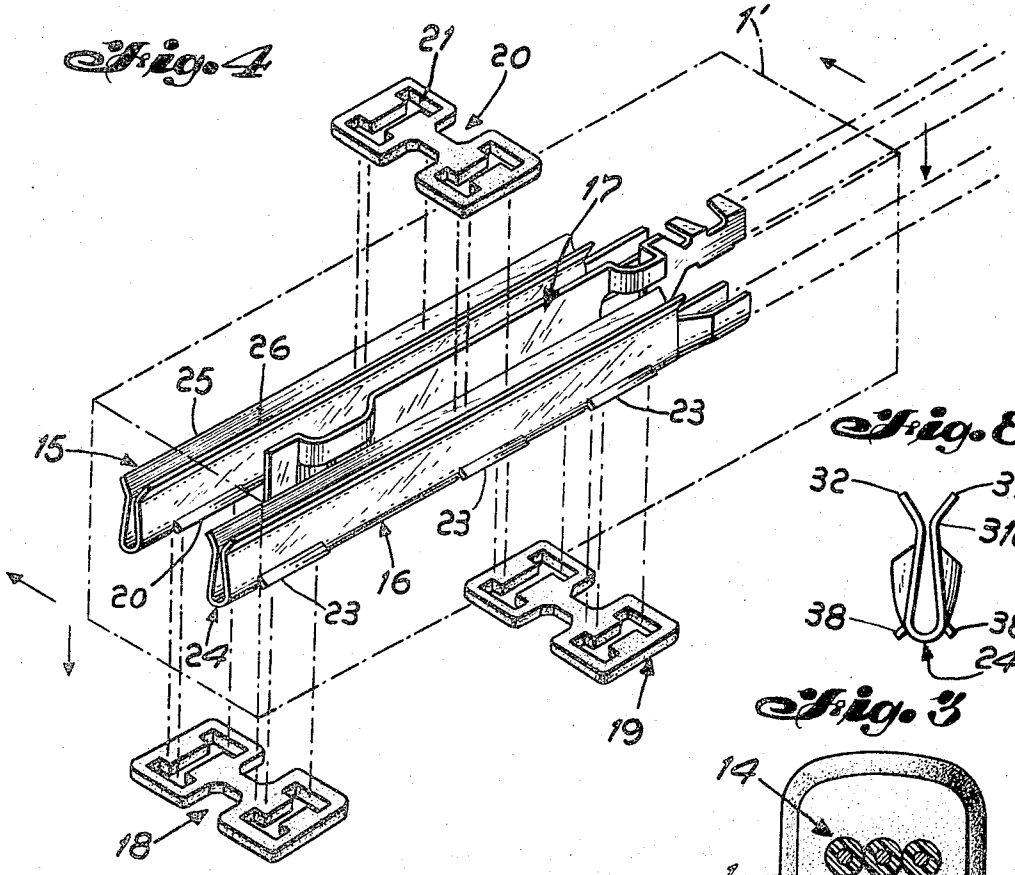


Fig. 8

Fig. 3

Fig. 9

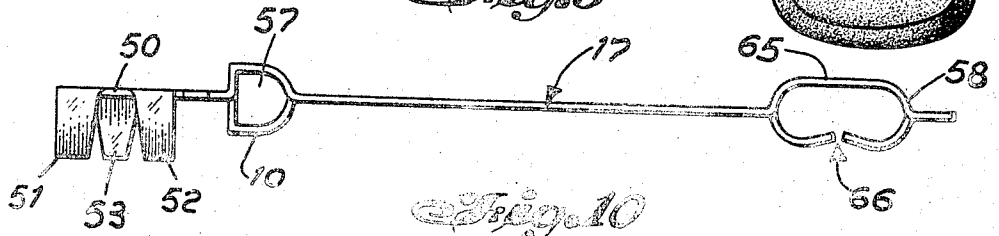
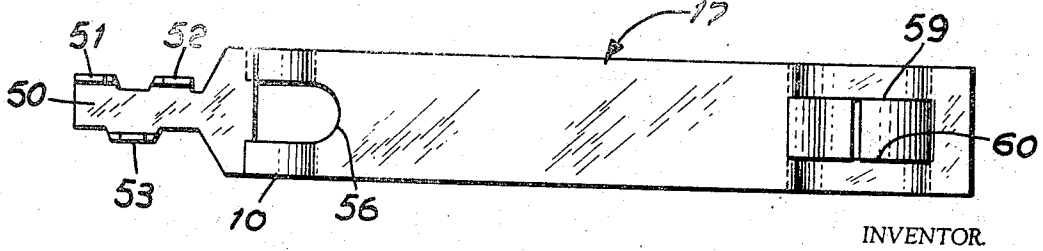


Fig. 10



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CURRENT TAP WITH GROUND

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8 Claims. (Cl. 339—14)

ABSTRACT OF THE DISCLOSURE

A current tap has a pair of parallel contact strips and an intermediate ground strip which can receive a plurality of plugs from opposite sides of the tap. The ground strip has transversely extending shaped portions forming the opening of the ground receptacles.

This invention relates to current taps such as cord connectors and convenience outlets and more particularly to a current tap with a ground contact.

The principal object of this invention is to provide a current tap with ground contact and having a novel contact arrangement therein.

Another object of this invention is to provide a current tap with ground which provides for receiving a plurality of male receptacles with ground contacts.

A feature of this invention is a current tap that comprises a molded body of resilient material and a pair of parallel contact strips disposed in the body and a ground contact strip disposed therein adjacent to the parallel pair of contact strips. On one side of the plug body there is a first pair of parallel plug receivable openings and on the side opposite, second and third pairs of parallel plug receivable openings. Disposed adjacent to each pair of parallel plug receivable openings is a ground connection opening.

Another feature of this invention is that each of the contact strips disposed in the body comprises a U-shaped member with the edges thereof being resiliently closed and openings in the base of the member for receiving connector plug blades. The ground contact strip is a single strip disposed intermediate the parallel contact strips and contains receptacles for receiving a plurality of ground connection members of the connector plugs.

The above-mentioned and other features and objects of this invention will become more apparent by reference to the following description taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a plan view of the current tap of this invention;

FIG. 2 is a plan view of the side opposite to that shown in FIG. 1;

FIG. 3 is an end view of the current tap;

FIG. 4 is an isometric view of the interior of the current tap;

FIG. 5 is a plan view of the contact strip;

FIG. 6 is a plan view of the side opposite to the side of FIG. 5;

FIG. 7 is a side elevation view of the contact strip;

FIG. 8 is an end view of the contact strip;

FIG. 9 is a plan view of the ground contact strip;

FIG. 10 is a side elevation view of the ground contact strip;

FIG. 11 is a view showing the means supporting one of the baffles of the current tap in position during the molding operation; and

FIG. 12 is a detail of one of the pins used as the supporting means in FIG. 11.

With reference to the figures there is shown an elongated molded body **1** having on one side thereof, a pair of

parallel plug openings **2** and **3** for receiving connector plug blades and on the side opposite two other pairs of parallel plug openings **4** and **5** and **6** and **7**. It will be observed that plug openings **2**, **5** and **7** are shorter than plug openings **3**, **4** and **6**. This is in accordance with Underwriter Laboratory requirements which state that a three wire device with provision for ground must be polarized. A two wire device may be polarized or unpolarized. The current tap of this invention must accommodate a two wire polarized attachment plug, which has one blade ¼" wide and the other blades 5/16" wide. It is further required that one should not be able to insert a two wire polarized plug, with manual force, in the incorrect position, and it should not be possible to make even momentary contact in the ¼" blade slot with the end of a round ground pin. Adjacent to each pair of parallel plug receivable openings and along the long axis of the molded body **1** there are semielliptical openings **10**, **11** and **12** adapted to receive ground connector plugs of a male receptacle with ground. The usual male receptacle with ground consists of a pair of parallel blades which has a rectangular cross-section and a ground connection which is either a cylindrical or U shaped pin and the blades and ground pin are adapted to fit and be received in the openings of this current tap.

Referring now to FIGURE 4 and the figures illustrating the embodiments of the contact strip and the ground contact strip, it is clear that contact strips **15** and **16** are disposed within the body parallel to the long axis in a position where the elongated connector blade openings of the molded body are adjacent the contact strips and parallel thereto. FIG. 4 is an isometric view of the interior of the molded body **1'** (shown in broken lines) with the portions of the body containing the parallel plug openings and the ground openings shown in exploded fashion to facilitate the description of this invention. With reference to FIG. 4, there are shown contact strips **15** and **16** and a ground contact strip **17** disposed in the connector body along the long axis thereof intermediate the contact strips **15** and **16**. Baffles **18** and **19** are disposed below contact strips **15** and **16** and baffle **20** is disposed above the contact strips. Each baffle has elongated openings **21** to permit connector blades to pass through and be received in associated opening **23** in the base **24** of the contact strips **15** and **16**. The connector blades that pass through the elongated openings **21** in the baffle **20** are first receivable between the resiliently closed edges **25** and **26** of the contact strip. It will be apparent that male connector plugs inserted from the bottom side of the body **1'** will first pass through the elongated openings in the baffles **18** and **19**, then through the openings **23** in the contact strips and will be resiliently retained by the edges **25** and **26**. The connector plug entering from the opposite side will first pass through the elongated openings in baffle **20**, then through the edges **25** and **26** where resilient contact will be made. The ground contact strip **17** is disposed in the connector body along the long axis thereof intermediate the two connector strips **15** and **16** with the elliptical and semielliptical receptacles therein adjacent to the semielliptical openings **10**, **11**, and **12** of the molded body **1** shown in FIG. 1.

Each of the contact strips **15** and **16** comprises an essentially U-shaped member **30** at one end of which is an open U-shaped channel **31** for receiving the ends of the connector wires **14** which are coupled to the contact strip **15**, **16**. The resiliently closed edges **25** and **26** of the connector strips **15** and **16** are pinched together along the length thereof and closed as shown at **31***a* with the edges **32** and **33** flared outwardly to provide easy access and entry for the connector blades of the male receptacle. In the base **24** of the U-shaped member opposite the resiliently closed portion of the strip **15**, there are shown three longitudinal

openings 23 with the ends thereof flared outwardly as shown at 38 to provide easy access and entry for connector blades entering the current tap from that side. To provide the requisite resilience, the material in the base end of the contact strips 15 and 16 is slit into the side of the base as shown at 40 and axially, and then spread apart to provide for the necessary elongated openings such as 23. As shown in FIGURE 4 the connector blades entering from the top side would enter through the baffle 20 and pass between the resiliently closed edges 25 and 26 of the contact strips and those entering from the bottom side of the connector body would enter respectively through the baffles 18 and 19 and pass through the openings 23 and be gripped by the resiliently closed edges 25 and 26 to make firm contact therein.

Referring now to FIGURES 9 and 10, the ground contact strip 17 essentially is a flat strip having at the end thereof a substantially U-shaped channel 50 with tabs 51 and 52 being on one side of the channel and tab 53 on the side opposite thereof. A semielliptical receptable is formed from the contact strip, adjacent to the U channel 50, and is adapted to receive the ground pin of a male receptacle. As shown in FIGURES 9 and 10, this receptacle is formed by slitting the contact strip in the middle thereof at 56 to form a tab and shaping the two portions into the semielliptical receptacle 57. At the other end of the ground contact strip 17 there is a substantially elliptical receptacle 58 which is formed in a similar manner by slitting strip 17 at 59 and 60 and shaping the resulting two sides into the elliptical receptacle 58. The receptacle 50 will accommodate two ground pins, one associated with the attachment plug engaging the contact strips at 2 and 3 and the other associated with the attachment plug engaging the contact strips at 4 and 5. The side wall 65 of the receptacle 58 is substantially straight and the opposite side wall 66 is angled in at the center thereof to provide resiliency to the two elements composing the side wall 66, so that when the ground contact pin of the male connector is pushed into the receptacle 58, good electrical and mechanical contact is assured. The semielliptical receptacle 57 also provides good mechanical and electrical contact when the ground pin is inserted therein, as the tab 10 provides a resilient force on the ground pin.

The molding material of which the body 1 of this current tap is made is and must be resilient so that the contacts can flex when an attachment plug is inserted. An example of a suitable material is polyvinyl chloride; however, other suitable materials having the desired characteristics may be used. Since the body molding material is resilient, the baffles are made of a substantially rigid material. In the molding process, the baffles 18 and 19 are supported on contact holding pins in the mold. However, as shown in FIG. 11, baffle 20 is supported on four pins 70, one on each corner of the baffle 20. Each pin 70, as shown in FIG. 12, is notched out at the baffle supporting end 71 to securely hold the baffle in position until the mold is closed. The baffle end is supported on the surface 72 and secured against transverse movement by the curved wall 73 which conforms to the curved end of the baffle. The four pins 70 make the four holes 75 shown in FIG. 2.

While I have described above the principles of my invention in connection with specific apparatus, it is to be clearly understood that this description is made only by way of example and not as a limitation to the scope of my invention as set forth in the objects thereof and in the accompanying claims.

I claim:

1. A current tap with ground comprising:
a molded body;
a first pair of parallel plug receivable openings in one side of said body;
second and third pairs of parallel plug receivable openings in the opposite side of said body;

a ground connection opening adjacent each of said pair of parallel plug receivable openings;
a pair of parallel contact strips disposed in said body in adjacent relationship to said pairs of parallel plug receivable openings; and
a flat ground contact strip having receptacles for receiving a plurality of ground connection members of connector plugs disposed between said contact strips and parallel thereto in adjacent relationship to said ground connection openings, said ground strip including a slit and two shaped portions extending from said slit in opposite transverse directions to form an opening of a ground receptacle.

2. A current tap with ground comprising:
a molded body of resilient material;
a first pair of parallel plug receivable openings in one side of said body;
second and third pairs of parallel plug receivable openings in the opposite side of said body;
a ground connection opening adjacent each of said pair of parallel plug receivable openings;
a pair of parallel contact strips disposed in said body in adjacent relationship to said pairs of parallel plug receivable openings, each of said contact strips comprising a U-shaped member with the long edges thereof being resiliently closed and openings in the base of the member for receiving connector plug blades; and
a ground contact strip having receptacles for receiving a plurality of ground connection members of connector plugs disposed between said contact strips and parallel thereto and in adjacent relationship to said ground connector openings, said ground strip including a slit and two shaped portions extending from said slit in opposite transverse directions to form an opening of a ground receptacle.

3. A current tap according to claim 2 wherein said molded body is an elongated body of resilient material and said pairs of parallel plug receivable openings and said ground connection openings are arranged in serial relationship.

4. A current tap according to claim 2 wherein each said contact strip is an elongated U-shaped member, one end of said U-shaped member being a channel adapted to receive a connector wire, the long edges of said member being flared outwardly and the edges of said openings being flared outwardly.

5. A current tap according to claim 2 wherein said ground contact strip comprises an elongated flat member having on one end thereof a U-shaped channel formed from a plurality of parallel tabs, said shaped portions forming an opening in said strip disposed adjacent said channel to receive one ground connection and a further slit and shaped portions forming another opening disposed in said strip at the other end thereof to receive two ground connectors.

6. A current tap according to claim 2 further comprising a baffle member disposed in said body between each pair of parallel plug receivable openings in said body and said pair of parallel contact strips.

7. A current tap with ground comprising:
an elongated molded body of resilient material;
a first pair of parallel plug receivable openings in one side of said body;
second and third pairs of parallel plug receivable openings in the opposite side of said body;
ground connection openings adjacent each said pair of parallel plug openings;
a pair of parallel contact strips disposed in said body in adjacent relationship to said pairs of parallel plug openings, each of said contact strips comprising an elongated U-shaped member with the edges thereof parallel to the long axis of said member being resiliently closed therealong and tapered transversely

to said long axis and outwardly from the resilient closure, a U-shaped channel at one end of said member, a plurality of rectangular openings in the base of said member with the side walls of said openings being tapered outwardly transversely to the long axis of said contact strip;

a ground contact strip disposed intermediate said pair of parallel contact strips and parallel thereto in adjacent relationship to said ground connection openings and comprising a flat strip having at one end thereof a U-shaped channel formed from a plurality of parallel tabs, a semielliptical receptacle in said strip adjacent said U-shaped channel and an elliptical receptacle disposed in said strip at the other end thereof.

8. A ground contact for a current tap comprising an elongated member, a U-shaped channel at one end thereof formed from a plurality of parallel taps defining said channel, a semielliptical receptacle in said member adjacent said channel comprising a first tab cut from said member and attached thereto at one end of said tab with the long axis thereof parallel to the long axis of said member, said tab forming one side of the curved portion of said semielliptical receptacle and a portion of the straight sides of said receptacle, the other side of said curved portion and the remainder of said straight sides being formed from said member adjacent said tab; said semielliptical receptacle being adapted to receive the ground pin of a male receptacle with ground, an elliptical receptacle at the other end of said member with the long axis thereof parallel to the long axis of said member comprising second and third tabs cut from said member and attached thereto at one end of each said member, said second and third tabs comprising one-half of said elliptical receptacle being formed from said member adjacent said second and third tabs, said second and third tabs being in abutting relationship at the center of said elliptical receptacle and being depressed inwardly therein to provide resilient means for said elliptical receptacle, said elliptical receptacle being adapted to receive ground pins of male receptacles with ground at each end of said elliptical receptacle.

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