

[54] **DIRECTION LOCK FOR ANGLE PLUG**

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[73] Assignee: General Electric Company

[22] Filed: July 29, 1971

[21] Appl. No.: 167,390

[52] U.S. Cl. 339/107, 339/196 A

[51] Int. Cl. H01r 13/58

[58] Field of Search.....339/103, 107, 99, 210, 202,
339/245, 196; 16/121; 248/188.2; 292/350;
151/41.73; 287/53 SS, 53 H

[56] **References Cited**

UNITED STATES PATENTS

3,335,395	8/1967	Smith	339/107
1,699,958	1/1929	Eby	339/202 X

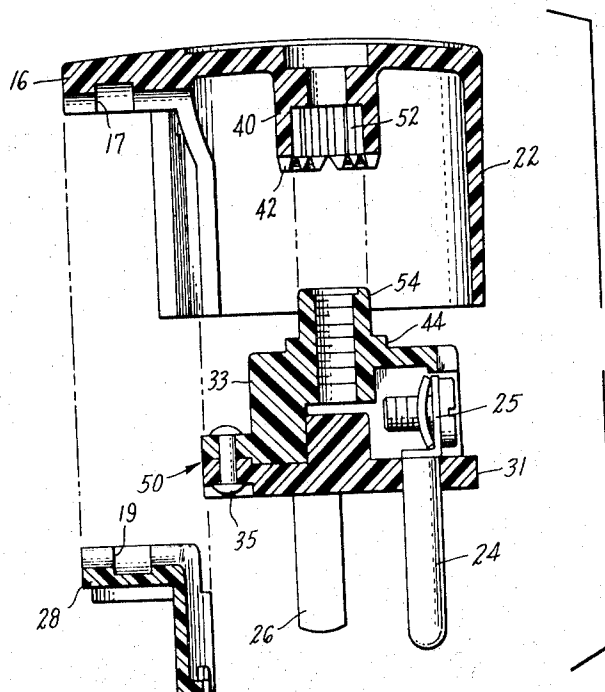
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[57] ABSTRACT

An angle cap having power blades extending generally at right angles to a power supply cable is provided with a means for disposing the cable at a number of radial angles relative to the blade orientation. Cooperation between the cover of the cap and the blade housing permits angular positioning of the blades relative to the cable so that once the blades are inserted in a stationary wall receptacle the cable will be positioned to lie in a preselected downward or side-ward or upward orientation. The cooperating angular indexing means includes an integrally formed collar of the cover and integrally formed post of the blade housing.

1 Claim, 10 Drawing Figures



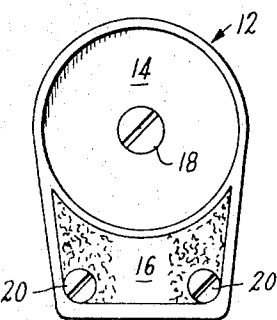


FIG. 1

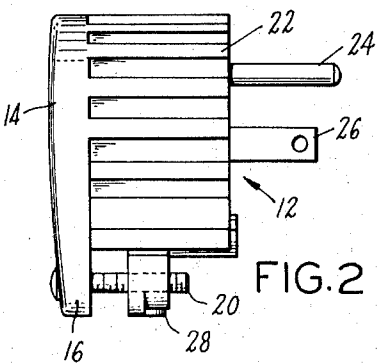


FIG. 2

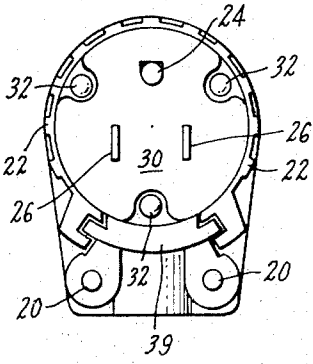


FIG. 3

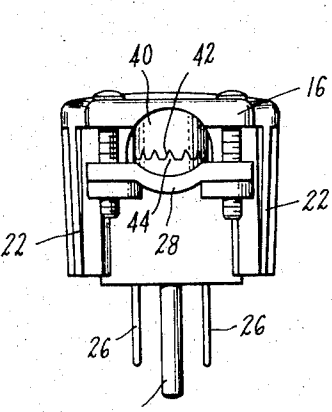


FIG. 4

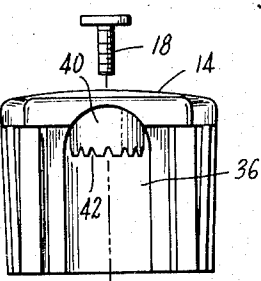


FIG. 5

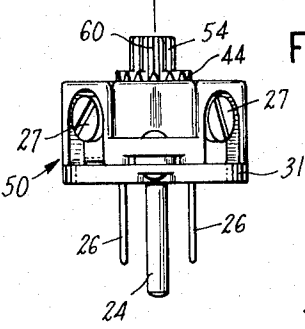
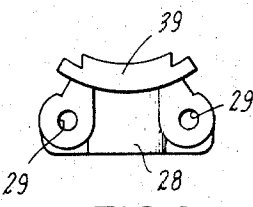


FIG. 6

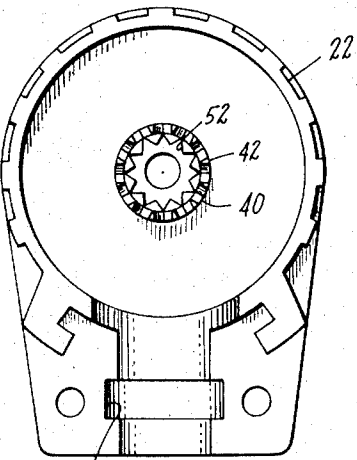


FIG. 7

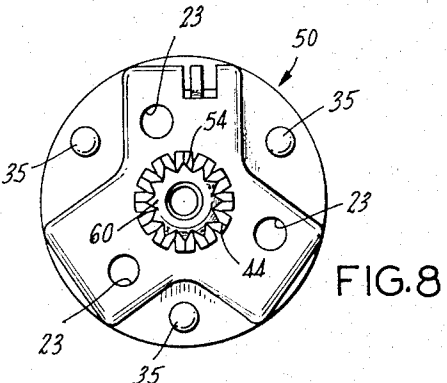
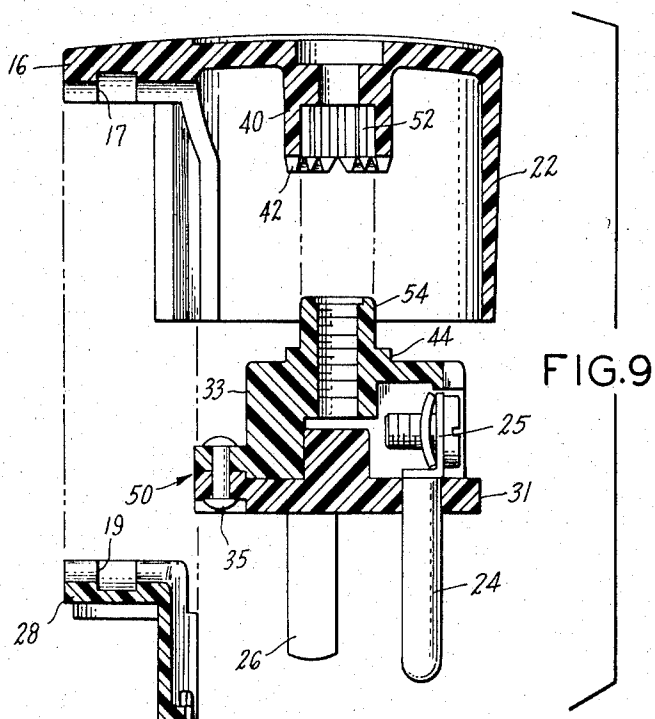
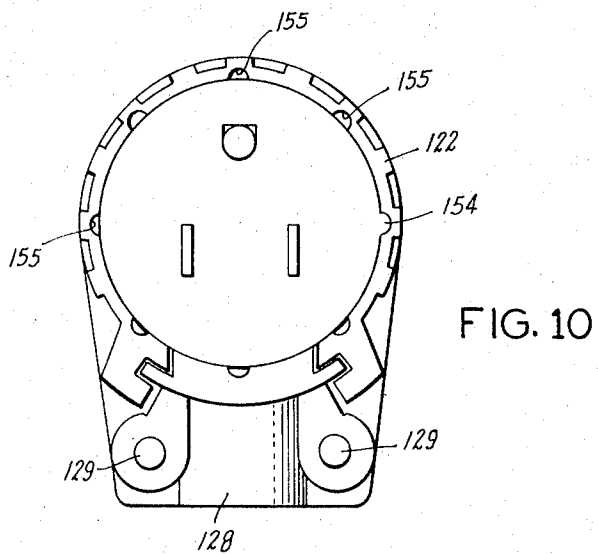


FIG. 8

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DIRECTION LOCK FOR ANGLE PLUG

This invention relates to electrical caps or plugs which have the blades extending from the cap generally at right angles to the direction of extension of the cord or cable which carries power from the plug. More particularly it relates to means for orienting the cable at various angles radially from the cap relative to the position of the blades where the blades are inserted in a wall receptacle having a fixed position for the blades.

When a heavy duty cap is used in a wall receptacle the position of the blades in the receptacle is determined of course by the orientation of the blade receiving slots in the receptacle. While the cable extending from the cap is generally at right angles to the blades, the cable can lie at any angle of the 360° around the receptacle represented by a flat wall in which the receptacle is fixedly mounted.

It is desirable to be able to orient the cord along the wall in a pre-selected direction either directly downward or horizontal to the floor or directly upward or at some intermediate angle depending on the location of the apparatus to which power is to be fed or what use is to be made of the powered cable.

An angle cap or plug having limited indexing capability is taught in U. S. Pat. No. 3,335,395.

Further, use of the angled cap is desirable as it conserves space and avoids a tangle of cables sticking directly out of a gang of wall receptacles thereby improving safety in use of caps and attached cables.

It is accordingly one object of the present invention to provide an angle cap having a cord clamp positionable at a plurality of angular orientations relative to blade orientation.

Another object is to provide an angle cap having a high degree of reliability in angular orientation of the cord clamp thereof.

A further object of the present invention is to provide an angle cap having versatility of orientation of the cord clamp at low cost.

Other objects and advantages of the invention will be in part apparent and in part pointed out in the description which follows.

In one of its broader aspects the objects of the present invention may be achieved by an angle cap having

an insulating housing,

a set of power contact blades having blade ends and wire clamp ends,

the wire clamp ends being mounted in said housing and the blade ends extending from said housing,

a post formed integrally with said housing and extending centrally from the face of said housing in a direction opposite to the direction of blade extension,

said post having splines axially extending along the length thereof and grooves radially extending at the base thereof,

an insulating cover having a side opening, said cover having an upper portion of a cord clamp extending radially from above the side opening of said cover and formed integrally therewith,

an internal collar depending centrally from the inner top surface of said cover,

said collar having internal splines extending longitudinally thereof and having radially extending grooves formed in the end of said collar,

screw means extending through said collar and post for securing said cover to said base

and a lower cable clamp member movable by mounting screws into cable compressing relation with said upper clamps.

The manner in which the present invention may best be carried into effect may be best described with reference to the accompanying drawings in which:

FIG. 1 is a top plan view of the angle cap of the present invention.

FIG. 2 is a side elevation of the cap of FIG. 1.

FIG. 3 is a bottom plan view of the cap of FIG. 1.

FIG. 4 is an end elevation of the cap of FIG. 1.

FIG. 5 is an exploded view of the cap as seen in FIG. 4 omitting a lower cable clamp.

FIG. 6 is a bottom view as seen in FIG. 3 of the clamp omitted from FIG. 5.

FIG. 7 is an internal view of the cover of the cap as seen in FIG. 3 but with the cable clamp and insulation body absent.

FIG. 8 is a top plan view of the insulating body showing the parts which mesh with parts on the inside of the cover of FIG. 7.

FIG. 9 is an exploded vertical section of the cap as seen in FIG. 2 in side elevation.

FIG. 10 is an alternative form of the cap of the present invention.

Referring now first to FIG. 1 there is seen the top of a cover 12 of a cap including a generally circular main portion 14 and an outwardly extending or visor portion 16. A central screw 18 serves to position and hold a blade housing, not seen, in the cover and screws 20 urge a cable clamp into compressing relation to a cable disposed between its upper and lower jaws.

Referring next to FIG. 2 the cover as seen in FIG. 1 is seen in side elevation. The cover 12 is seen to have side ribs 22 a top main portion 14 and visor portion 16. Grounding blade 24 and power blade 26 extends out from blade housing not seen. Screw member 20 extends through the visor 16 and engages the threaded portion of lower clamp 28 of the opposed clamp jaws 16 and 28.

Referring next to FIGS. 3, 4, and 5 the relation of several parts of the device of the present invention is brought out. In FIG. 3 blades 24 and 26 are seen in end view projecting from the face 30 or the cap. Rivets 32 extend through body 30 and hold the body parts securely including the face plate 31. It is evident that with the blades and slots of wall receptacles in the position shown in FIG. 3 the cord clamp extends directly downward. However, it may be desirable to have the cord extend to either side or upward or at some intermediate angle.

The manner in which this may be achieved is made evident with reference to FIG. 5 in which an exploded view of the cap is given with cap oriented as seen in FIG. 4 but with the lower clamp jaw 28 omitted. As seen the cap has a side wall cable opening 36 extending through the wall of the main portion 12 of the cover and through a portion of visor 16 to form the upper member of a cable clamp. Seen through opening 36 in a depending collar 40, centrally located within main portion 14 of cap 12. The collar 40 is provided with depending teeth 42 which mesh with the teeth 44 formed integrally with the upper surface of housing 46 of insu-

lating body 50. The insulating body 50 is in some respects similar to structure taught in U. S. Pat. No. 3,461,417 issued Aug. 12, 1969 and assigned to the same assignee as this application.

The sets of teeth 42 and 44 are quite distinct from any prior structure. They are really radially extending ribs extending out from a set of matching splines 52 and 54 on the inside and outside respectively of collar 40 and post 60. The combination of teeth and splines are also quite distinct from any prior structure.

As seen in FIGS. 7 and 8 there are twelve splines and twelve teeth in each set on both post 60 and collar 40. This permits the cap to be set at any of twelve pre-selected positions. Or to put it another way, once a cable clamp direction has been selected, this permits the blades to be set in any of a plurality of incremental angular orientations.

Whichever is considered to be the primary choice of orientation, the net result is that there are 12 positions in which the cable clamp can be set relative to the blade orientation.

Further it is evident that the indexing of the clamp and cover about the blade holding body is accomplished with adjustment of a single screw and that the indexing is accordingly readily done. This greatly facilitates selection of and adjustment to the direction in which the cord extends from the cap.

The cable is held between jaws 17 and 19 of the clamp halves 16 and 28. The outer sheath of a cable is held between these jaws while the inner end is stripped so that the individual insulated wires of the cable may be extended to the individual wire clamps such as 25 of FIG. 9 and 27 of FIG. 5. The individual wire ends are first stripped and the stripped wire ends inserted through wire entry ports 23 into contact with the wire clamps.

One feature of the structure of the present invention concerns the interlocking of the spline and tooth surfaces of the integrally formed post 60 with the spline and tooth surfaces of the integrally formed depending collar 40. The screw 18 is used to urge the two matching sets of surfaces into engagement after the angle of cord clamp orientation is selected by starting the post and collar union by sliding the two together at one of the 12 angles at which they can be set. The metal screw is completely sheathed within the housing as the integral post and collar are themselves formed of the insulating material of the housing. The front face piece 31 is held to the insulating housing body 33 as best seen in FIG. 9 by rivets 35.

The lower clamp member 28 is provided with a

curved clamping surface which contains a slot 19 for compressive gripping of a pliable outer insulation of a cable matching the slot 17 in the clamping surface of upper clamp 19.

In addition two threaded screw holes 29 provide the means by which screw pressure is developed in effecting a strong clamping grip on a cable.

Further the lower clamp member has a short sector of arcuate wall 39 which nests in a supporting keyway 41, 43 as more fully described in copending application Ser. No. 167,389 filed July 29, 1971 and assigned to the same assignee as this application.

FIG. 10 illustrates an alternative angular indexing control means. Pursuant to this scheme splines 154 are formed at regular spacings around body 131 and matching grooves 155 are formed in the inner surface of cover 122. As shown the seven splines and grooves make seven alternative indexing orientations of cable clamp 128 feasible. Use of additional regularly spaced splines and grooves increases the number of orientations at which the cord clamp can be set relative to the body.

What is claimed is:

1. An angle cap comprising
 - a generally circular insulating housing,
 - power contacts having a wire clamp end and a power blade end,
 - said wire clamp ends being supported in said housing and said blades extending through a face thereof,
 - a cover enclosing portions of said housing other than the face thereof through which the blades extend,
 - a side opening in said cover and a visor shaped upper clamp over said opening on said housing,
 - a closure covering said side opening including a side wall section and an outwardly extending lower clamp member,
 - a post formed integrally with and rising from the rear surface of said insulating housing, said post having laterally extending external splines along the length thereof and radially extending ribs at the base thereof and having an internal threaded screw hole,
 - a collar formed integrally with and depending centrally from the internal surface of the cover, said collar having internal longitudinally extending splines along the internal surface thereof and radially extending ribs at the lower end thereof, conforming to the ribs and splines of said post,
 - said cover having a central screw opening providing screw access to the threaded hole of said post.

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