

[54] SAFETY PLUG

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[51] Int. Cl. H01r 33/06

[58] Field of Search 339/18 P, 31.33, 61, 74,
339/75 R, 75 P, 75 M, 82, 195, 196, 37, 91
R, 14 RP

[56]

References Cited

UNITED STATES PATENTS

2,149,550	3/1939	Richards et al.	339/74 R
2,478,570	8/1949	Crehan	339/31 R X
2,723,381	11/1955	Collins	339/61 R
2,850,711	9/1958	Terlinde	339/74 R X
2,879,494	3/1959	Teetor	339/37
2,885,650	5/1959	Miller et al.	339/91 R

2,989,719 6/1961 Aarlaht 339/31 R

FOREIGN PATENTS OR APPLICATIONS

1,012,702 4/1952 France 339/74

OTHER PUBLICATIONS

Cochran et al., "Test Socket For Pin Contacts," IBM
Tech. Disc. Bulletin, Vol. 6 No. 5, 10-1963, page 44.

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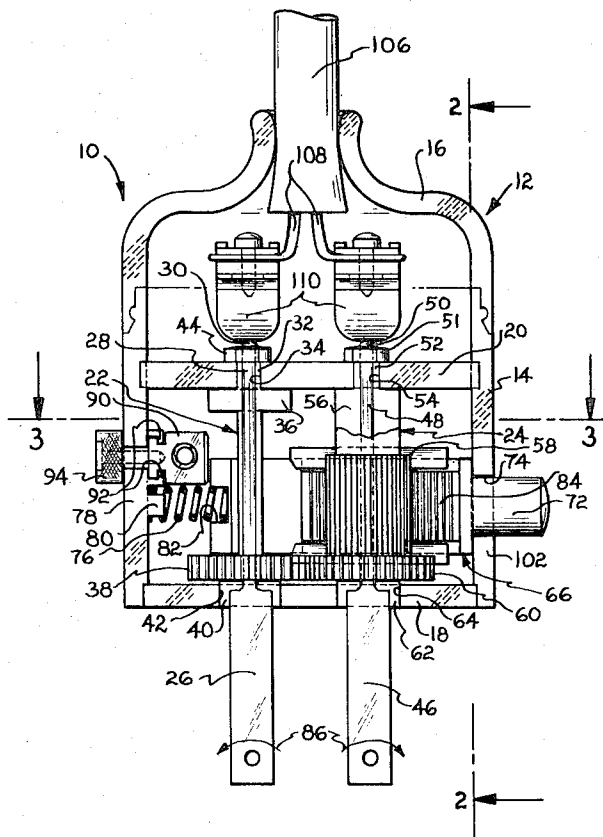
Attorney, Agent, or Firm—Thomas Hooker

[57]

ABSTRACT

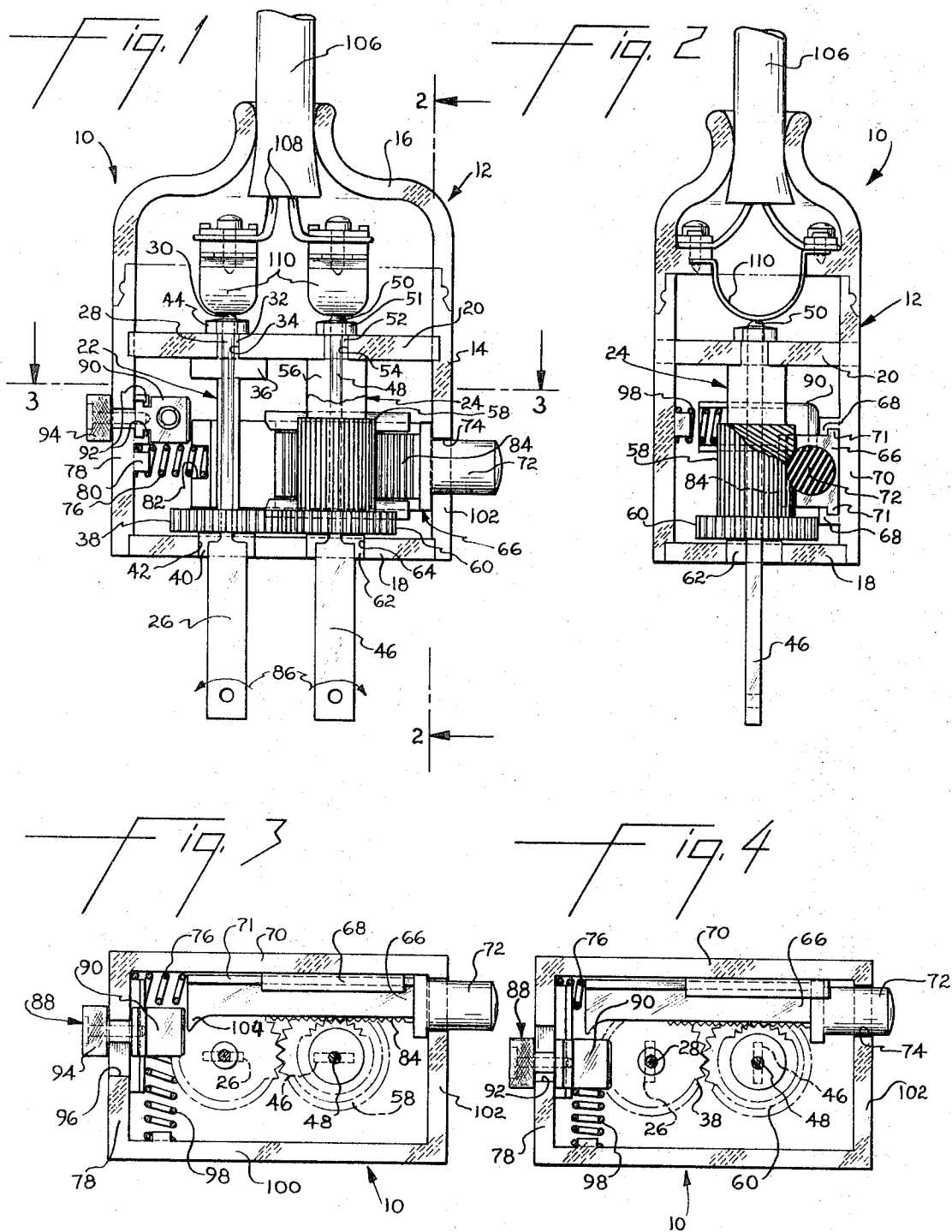
An electrical safety plug with rotatable male blades. When inserted in a female socket, the blades are biased for rotation about their longitudinal axis so that when the plug is withdrawn the blades rotate and then lock in a position making it impossible to reinsert the plug in the socket.

7 Claims, 4 Drawing Figures



PATENTED SEP 24 1974

3,838,385



SAFETY PLUG

The invention relates to a safety plug of the type used on line cords for electrical tools, lamps, appliances, phonographs and other electrically powered items. The male prongs are rotatable about their longitudinal axis and are normally held in a flat position with co-planar sides so that it is impossible to insert the blades in a standard female electrical outlet. The plug includes a push button blade drive in which a spring normally holds the blades in the co-planar position. A spring-biased lock prevents rotation of the blades from a co-planar position to the spaced parallel position for insertion into an electrical outlet.

The plug may be inserted into a standard electrical outlet by the two step operation of releasing the spring lock and then depressing the push button against the drive spring. Movement of the push button rotates the blades 90° to the spaced parallel position permitting insertion into the outlet. After the plug is fully inserted the push button is released and the spring drive rotationally biases the blades held in the outlet.

Upon withdrawal of the plug from the outlet the drive spring automatically rotates the blades back 90° to the co-planar safety position and the spring lock falls into place to lock the blades in this position so the plug cannot be accidentally reinserted into the outlet.

My safety electrical plug is particularly useful in reducing accidental electrical shocks and injury to children resulting from their playing with electrical plugs. If a child removes the plug from the outlet, the blades are automatically locked in a position to prevent re-engagement with the electrified contacts in the outlet. Accidental re-insertion of the plug is prevented. While the safety feature of the plug protects young children and others from accidental injury, adults can easily insert the plug into an outlet socket by the two step operation of removing the lock and depressing the push button.

Other objects and features of the invention will become apparent as the description proceeds, especially when taken in conjunction with the accompanying drawings illustrating the invention, of which there is one sheet.

IN THE DRAWINGS

FIG. 1 is a sectional view taken through the plug illustrating the blades locked in the safety or co-planar position;

FIGS. 2 and 3 are sectional views taken along line 2—2 and 3—3 respectively of FIG. 1; and

FIG. 4 is a view similar to that of FIG. 3 illustrating the blades rotated 90° to the spaced parallel position for insertion into an electrical outlet.

Plug 10 includes an insulating body 12 having a number of component members including shell 14, snap cover 16, end wall 18 and interior wall 20. It is a matter of design whether the body members are individual as shown or integral. A pair of blade units 22 and 24 are journaled in walls 18 and 20 for rotation relative thereto. Unit 22 includes a flat contact blade 26 extending outwardly of wall 18 with a blade extension 28 extending through walls 18 and 20 to end contact 30. An insulating body surrounds extension 28 and includes a trunion 32 in hole 34 through wall 20, bearing flange 36, rotation gear 38 and trunion 40 in opening

42 in the bottom wall 18. A stop nut 44 may be provided on blade end contact 30 if desired.

Blade unit 24 includes a flat contact blade 46 with a narrow blade extension 48 extending through walls 18 and 20 to end contact 50. Stop nut 51 may be provided at contact 50. An insulating body surrounds part of blade 46 and includes a trunion 52 in hole 54 through a wall 20, cylinder 56 adjacent the bottom of wall 20, drive gear 58, rotation gear 60 and a lower trunion 62 within hole 64 in lower wall 18. Gears 38 and 60 are meshed so that blade assemblies 22 and 24 rotate together and in opposite directions.

Elongate slide 66 is held on the flat interior surface of shell side wall 70 by guides 68 which extend over projections 71 on the slide. Push button 72 at one end of slide 72 extends outwardly of body 12 through opening 74 in the shell. A slide spring 76 is confined between the other end of the slide and shell wall 78 and biases the slide away from wall 78. One end of the spring 76 is fitted over a post 80 on wall 78 and the other end is confined in a recess 82 in the slide.

Teeth 84 on the slide mesh with teeth of gear 58 so that when button 72 is depressed against spring 76, the blades 26 and 46 are rotated 90 degrees in the direction of arrows 86 from the co-planar position to the spaced parallel position to permit insertion of the blades into a conventional electrical outlet having parallel blade receiving female receptacles.

Slide lock 88 is provided to lock slide 66 in the position of FIGS. 1, 2 and 3. The lock includes a locking body 90 mounted on the interior surface of shell wall 78 by a pair of guides 92 to permit movement along the interior surface toward and away from slide 66, as illustrated best in FIGS. 3 and 4. Handle 94 outside of the body 10 is connected to body 90 through slot 96 formed in wall 78. Spring 98 is confined between body 90 and shell side wall 100 to bias the locking body into the path of movement of slide 66. In the safety position of FIGS. 1, 2 and 3, spring 76 holds slide 66 against the shell wall 102 and spring 98 holds lock 88 in the path of extension of slide 66 to assure that the blades 26 and 46 are held in the flat or co-planar position. An extension 104 may be provided on the end of slide 66 adjacent stop 88 to increase the overlap between the slide and stop.

A line cord 106 extends into the interior of plug 10 through an opening in the cap 16 and carries a pair of conductors 108 which are secured in electrical connection with downwardly bowed spring contacts 110. Contacts 110 are biased against blade end contacts 30 and 50, as illustrated in FIGS. 1 and 2, to establish electrical connection between the blades and the conductors while permitting rotation of the blades.

When plug 10 is removed from an electrical outlet, spring 76 moves slide 66 against wall 102 thereby rotating the blades 26 and 46 to the flat or co-planar position of FIGS. 1 and 2. Slide lock 88 snaps behind slide 66. In this position it is not possible to insert the blades into the power socket. Spring 98 holds lock 88 in the path of movement of slide 66 so that the button 72 cannot be depressed to rotate the blades back to the spaced parallel position for insertion into the power outlet.

Before plug 10 may be inserted into an outlet, lock 88 must be moved away from wall 70 against the force of spring 98 and out of the path of slide 66. With the lock held away from the slide, button 72 may be de-

pressed to thereby rotate blades 26 and 46 through 90° to the position illustrated in FIG. 4 where the blades are parallel to each other. With the button held in against spring 76 the plug may then be inserted into the outlet. When inserted, the plug blades are held in the parallel position in the outlet.

When the plug is removed from the socket spring 76 moves slide 66 from the position of FIG. 4 to the position of FIG. 3 thereby automatically rotating the blades 90°. Spring 98 moves stop 88 behind the end of slide 66 to prevent accidental re-rotation of the blades to the insertion position.

Plug 10 provides a locking system which automatically rotates the contact blades through 90 degrees when the plug is removed from the socket. In order to re-rotate the blades into position for insertion into the socket, it is necessary to first release the lock 88 and then depress plunger 72. Rotation and locking of the blades in a non-insertion position is a safety feature which prevents children playing with the plug from being able to insert the plug into a socket. The two step operation required to rotate the blades into insertion position, together with the requirement that the button be held depressed during insertion, is a relatively involved procedure beyond the capability of young children.

While I have illustrated and described a preferred embodiment of my invention, it is understood that this is capable of modification, and I therefore do not wish to be limited to the precise details set forth, but desire to avail myself of such changes and alterations as fall within the purview of the following claims.

What I claim as my invention is:

1. A safety electrical plug comprising an insulating body, a pair of spaced elongate flat contact blades rotationally mounted in the body and extending therefrom for engagement with a socket type electrical outlet, contact means for connecting the blades to the conductors of a line cord, and drive means for rotating the blades about their longitudinal axes between a spaced parallel position for engagement with the socket outlet and a co-planar safety position, said drive means in-

cluding biasing means urging the blades toward the safety position.

2. A safety electrical plug as in claim 1 including lock means for securing the blades in the safety position.

3. A safety electrical plug as in claim 1 wherein said drive means includes a slide on the body having a push button extending outwardly of the body, a rotational drive connection between said slide and one of said blades, and a rotational drive connection between said one blade and the other blade whereby the blades rotate together.

4. A safety electrical plug as in claim 3 including a lock member, engageable with said slide to lock the same in a given position.

5. A safety electrical plug including an insulating housing; a pair of blade assemblies in said housing; each assembly including a portion rotatably mounted in the body, a flat contact blade extending outwardly of the body, means for forming an electrical connection with a conductor, and a gear meshed with the gear of the other assembly; a slide on the body having a push button on one end thereof extending outwardly of the body; a rotational drive connection between said slide and one assembly; and a spring biasing said slide to extend the push button from the body whereby depression of the push button rotates said blades in one direction and the spring rotates the blades in another direction.

6. A safety electrical plug as in claim 5 including lock means for limiting movement of the slide.

7. A safety electrical plug including an insulating housing; a pair of elongate flat blades extending from the housing; rotatable mounting means in the housing for one of said blades whereby the blade may be rotated relative to the housing; means for forming an electrical connection between the blades and the conductors of a line cord; drive means for rotating said one blade about its longitudinal axis between two positions, said drive means including biasing means urging such blade toward one of such positions; and lock means for holding such blade in such one position.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,838,385 Dated September 24, 1974

Inventor(s) Jack W. Bloomingdale

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

On the cover page at [76] change "Harrisburg" to
--Mechanicsburg--.

Signed and sealed this 12th day of November 1974.

(SEAL)
Attest:

MCCOY M. GIBSON JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents