March 24, 1964 K. BERGER 3,126,160

SOCKET SHELLS

Filed Sept. 25, 1957 3 Sheets-Sheet 1

Fig. 1.

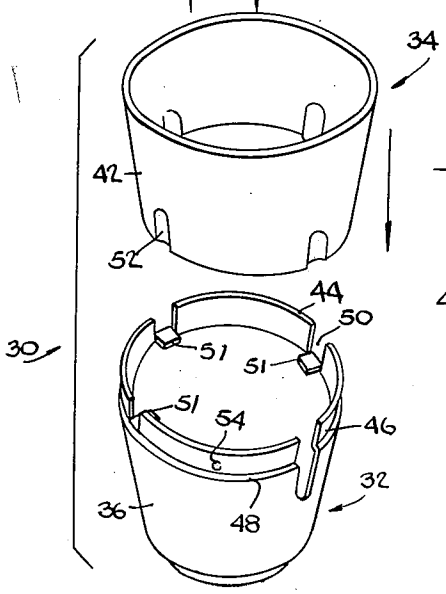


Fig. 2.

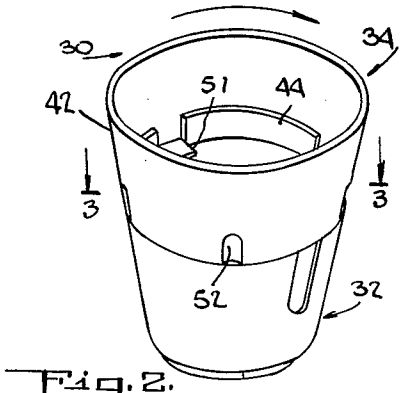


Fig. 5.

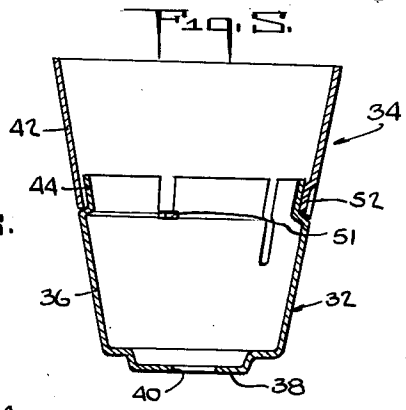


Fig. 6.

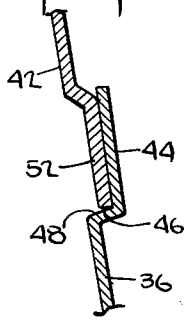
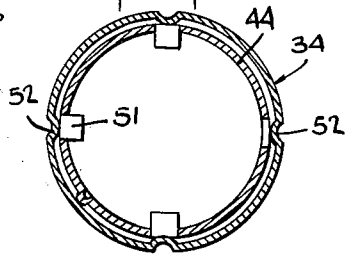


Fig. 4.



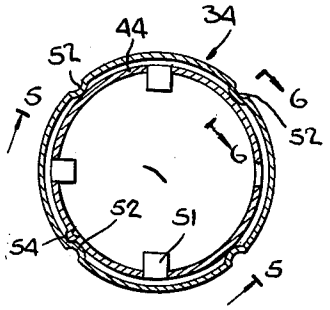


Fig. 3.

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SOCKET SHELLS

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Fig. 7.

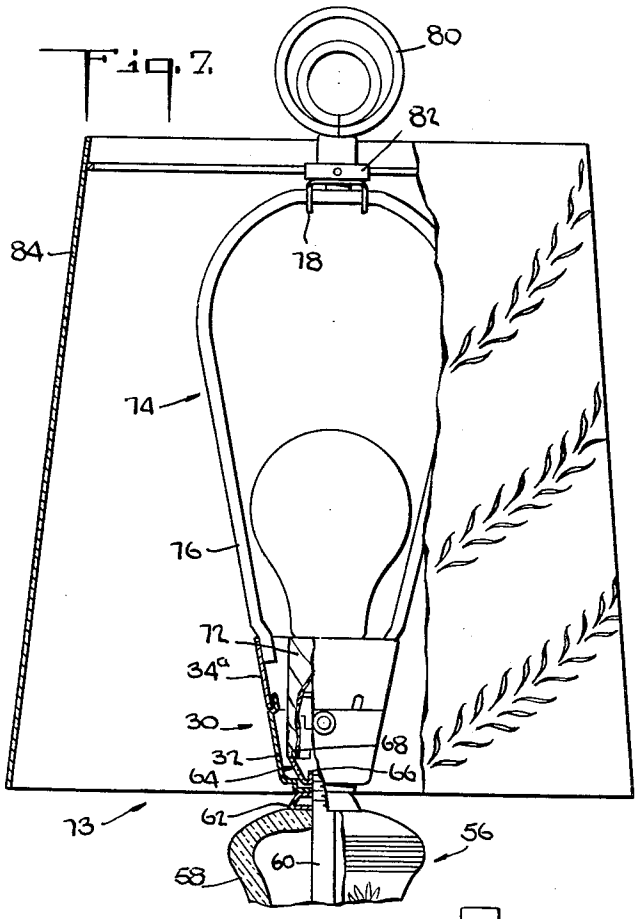


Fig. 12.

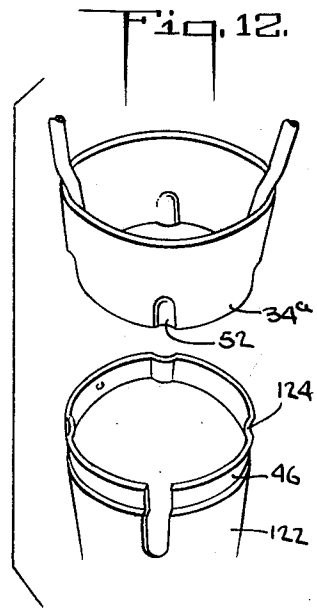
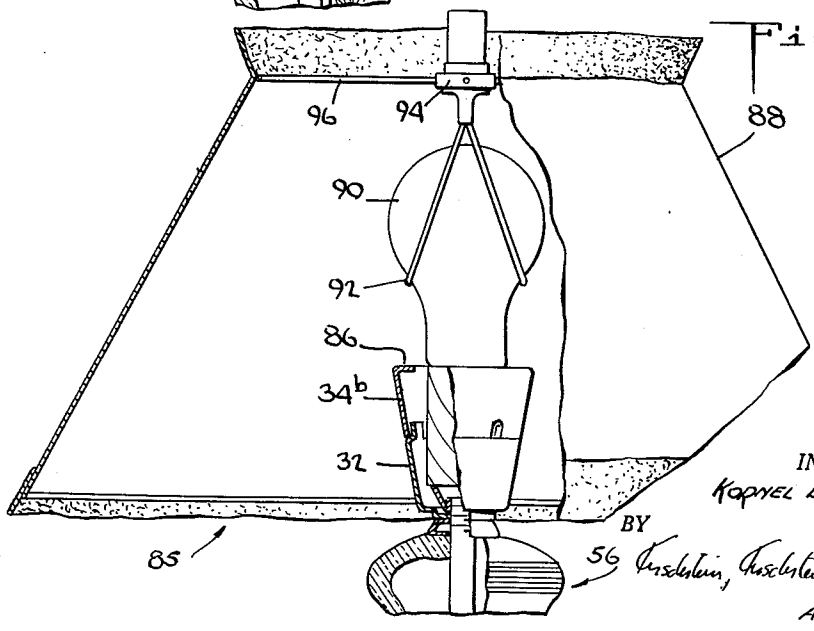


Fig. 8.



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SOCKET SHELLS

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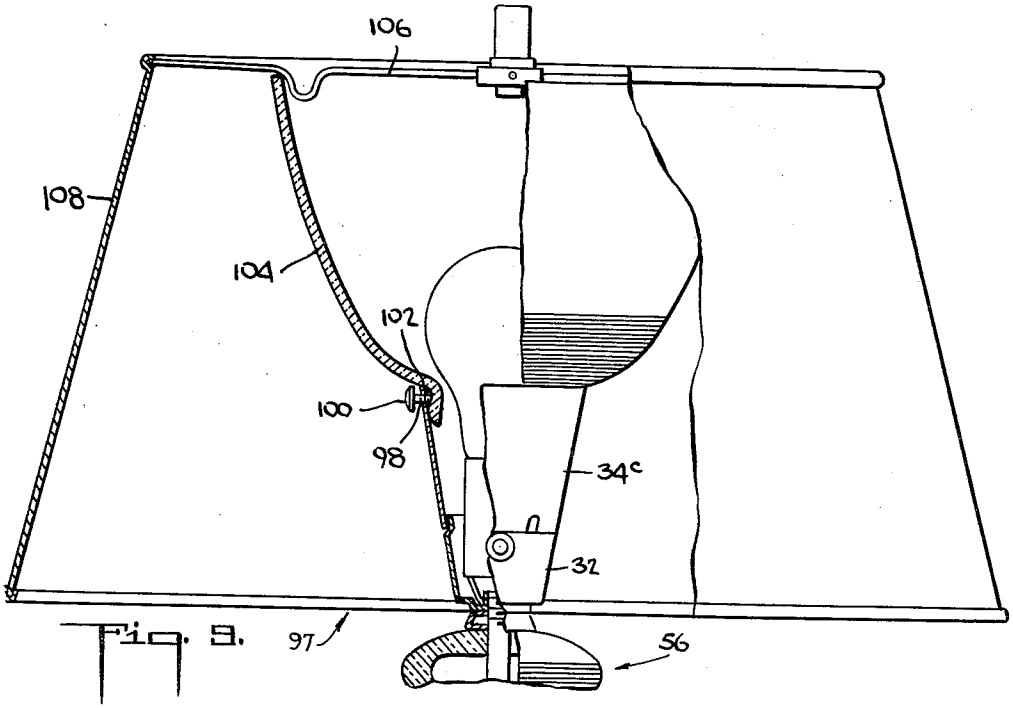


Fig. 9.

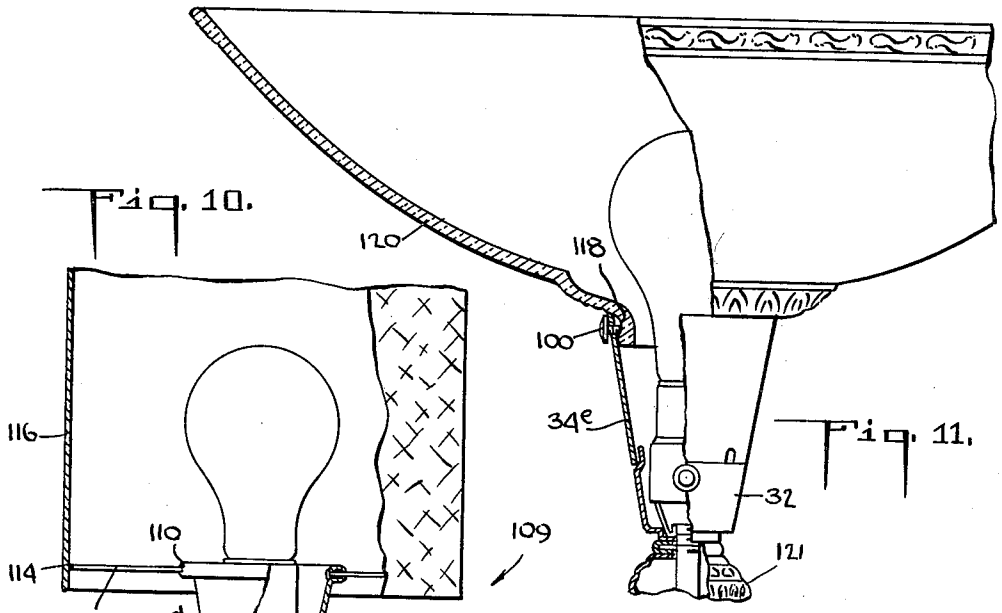


Fig. 11.

Fig. 10.

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United States Patent Office 3,126,160 Patented Mar. 24, 1964

3,126,160

SOCKET SHELLS

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Filed Sept. 25, 1957, Ser. No. 686,084
2 Claims. (Cl. 240—153)

This invention relates to socket shells.

A conventional household electric socket of the type which is adapted to have a bulb or attachment detachably secured thereto, as by threading therein, customarily includes an Edison threaded ferrule and optionally a switch mechanism, these two parts, when furnished, are an integrated whole which, in the trade, are known as a socket "interior." Even in the absence of the switch mechanism, the ferrule and its support likewise are known as a socket "interior." A conventional socket of the character described further includes a cover for the interior known as a "shell." In a present day standard socket the shell comprises two sections, one of these being a shallow flanged dish-shaped base located at the end of the socket interior where the wire enters, and the other being a sleeve-shaped piece which is comparatively long and extends over almost the full length of the socket ferrule. Accordingly, when the sleeve is removed, the Edison screw ferrule, and the switch mechanism, if present, are almost entirely exposed. The sleeve and base are detachably secured to one another by a snap connection, and for this purpose the sleeve customarily includes an annularly arranged set of indentations, and the base flange includes a matching series of inwardly extending protuberances designated to be received in said indentations. The end of the sleeve on which the indentations are formed is flexible, this effect being secured by making the shell of light sheet metal and by notching. Thereby, this end can be constricted and introduced into the open mouth of the base whereupon when said end of the sleeve is released, it will expand and lock the two parts of the shell together.

Although the foregoing construction is quite satisfactory from the point of view of cost, it is subject to a great many drawbacks. For instance, when it is desired to utilize such a socket in an electric lighting device (this including, by way of example, electric lighting fixtures and electric lamps), it is necesary to employ an extra element or elements for proper mounting of a lamp shade or equivalent part. Thus, if the socket is to be used in a simple lamp, the manufacturer often will provide an ornamental cover for the shell and also will utilize a spring clip that is adapted to grasp the light bulb and to carry a lamp shade. If the socket is used in a table lamp or in a more elaborate lamp, the manufacturer will provide a holder or husk which is fastened below the socket and which carries a lamp harp or bowl to support a shade.

It will be appreciated by experienced workers in the lamp field that, with the exception of the spring clip, the extra element is attached to the lamp adjacent the base of the socket or to the socket itself. Hence, once manufacture of a lamp is complete, the character of the lamp is permanently fixed because the shade must be attached to the specific shade support which has been provided for it and the position and type of which now is permanently fixed. Phrased differently, if a manufacturer wishes to change a lamp from, say, one using a harp supported shade to one using a bowl, it is necessary almost completely to disassemble the lamp so as to substitute a bowl holder for the harp. This means that once a lamp has been made and shipped it is impossible, as a practical matter, for a householder or retailer to change the lamp after it is in his possession so that a retailer therefore must carry a comparatively large stock of lamps on hand at all times

and a householder must buy a new lamp if she wishes a change in the type of shade.

Another well known disadvantage of a conventional Edison household socket is the weak joint between the sleeve and base. It has been pointed out above that this joint, as a matter of standard practice, is a simple snap fitting. If the sleeve is hit from the side or is twisted, it almost immediately pops out of the base. Many people will not try to reassemble the socket cover and either discard the lamp or bring it in for repair. Even if the householder effects the repair himself, the shell never again is as strong as it was originally, and, moreover, he runs the risk of getting a severe shock because the insulating sleeve inside the socket shell becomes fragile with age and is liable to break when the sleeve is constricted so that the sleeve may touch the Edison ferrule and become "hot."

It is an object of my invention to provide a unique new socket shell which obviates all of the foregoing difficulties.

More specifically, it is an object of my invention to provide for an Edison socket interior a socket shell which permits the type of lamp to be altered after manufacture is complete, that is to say, which enables a lamp to be changed freely from one type to another as, for instance, from harp to bowl holder, to a spring clip type, to a spider type holder, to a husk etc., in a rapid and simple manner without disassembling the lamp or demounting the socket.

It is another object of my invention to provide a socket shell of the character described which constitutes two parts one of which is designed to be a permanent part of the lamp and to be permanently secured to the socket interior, and the other of which is rapidly detachably and firmly engaged to the first part and, optionally, includes a holder for a shade or the like, the two parts complementing one another to form a cover for a socket interior, whereby the shell itself, when fully assembled, includes a shade holder or like element.

It is another object of my invention to provide a socket shell of the character described constituting a pair of parts which together fully cover a socket interior, wherein the two parts are so detachably integrated with one another that despite a comparatively lightweight construction, they are firmly interlocked and cannot come apart upon accidental application of stresses such as are occasioned by knocking, accidental turning or transverse strain.

It is another object of my invention to provide a socket shell of the character described which will permit retailers and distributors greatly to lessen their stock on hand and will permit them at the very last moment to alter the type of lamp on any given base.

It is another object of my invention to provide a new rugged and reliable two-part socket shell.

It is another object of my invention to provide a novel detachable harp.

It is another object of my invention to provide a socket shell of the character described which constitutes relatively few and simple parts, is extremely sturdy and durable and has a compact, neat and attractive appearance.

It is another object of my invention to provide a socket shell of the character described which can be put together or taken apart with great ease and despite its many advantages, can be manufactured at a low cost.

Other objects of my invention in part will be obvious and in part will be pointed out hereinafter.

My invention accordingly consists in the features of construction, combinations of elements and arrangements of parts which will be exemplified in the socket shells hereinafter described and of which the scope of application will be indicated in the appended claims.

In the accompanying drawings in which are shown various possible embodiments of my invention:

FIG. 1 is an exploded perspective view of the two parts

of a socket shell constructed in accordance with my invention and which, when integrated, constitute a husk;

FIG. 2 is a view similar to FIG. 1 but showing the two parts assembled;

FIG. 3 is a sectional view taken substantially along the line 3—3 of FIG. 2 and showing the two parts of the shell in their interengaged position;

FIG. 4 is a view similar to FIG. 3 but illustrating the parts of the shell after they have been internested but not yet interengaged;

FIG. 5 is a longitudinal sectional view through the socket shell, the same being taken substantially along the line 5—5 of FIG. 3;

FIG. 6 is an enlarged sectional view taken substantially along the line 6—6 of FIG. 3;

FIG. 7 is a partly broken away fragmentary side elevational view of a lamp including a harp type socket shell embodying my invention;

FIG. 8 is a view similar to FIG. 7 showing the socket shell altered to provide a husk type of shell;

FIG. 9 is a view similar to FIG. 7, but showing the socket shell altered to provide a bowl holder type of shell;

FIG. 10 is a view similar to FIG. 7 but showing the socket shell altered to provide a spider type of shell;

FIG. 11 is a view similar to FIG. 9 illustrating how a bowl holder type of shell can be utilized in a floor lamp; and

FIG. 12 is a view similar to FIG. 1 of the two parts of a socket shell embodying a modified form of my invention.

Referring now in detail to the drawings, and more particularly to FIGS. 1 through 6, the reference numeral 30 denotes a socket shell, that is to say, a cover for a socket interior, which is constructed in accordance with and embodies my invention. Said socket shell basically, pursuant to the teachings of my invention, is formed in two parts, to wit, a cup-shaped base part 32 and a sleeve-shaped upper part 34. The terms "base" and "upper" are used herein for convenience, with the reference being a socket for supporting an electric light bulb in upright position with its threaded ferrule lowermost. Under such circumstances, the base part 32 of the socket shell will be lowermost and the upper part 34 will be at the top. However, it is to be understood that these terms simply are used for convenience and that the socket shell can be employed in any conventional position including positions in which the base part and upper part are at the same level and positions in which the base part is above the upper part, for instance when the socket shell is utilized in a drop or hanging lamp or in a ceiling fixture.

The base part 32 essentially includes a tubular side wall 36 having an open upper end and an apertured bottom wall 38. The specific configuration of the side and bottom walls is not a limiting factor of my invention and may be of any contour required by the trade. As shown herein, the side wall 36 is of frustoconical configuration with its wide end upeprmost. The bottom wall 38 is dish-shaped, being substantially flat but having a large central shallow depression the center of which is pierced by a through opening 40. The base part is circular in transverse contour.

Said base part, as well as the upper part, desirably is fabricated from sheet metal, but this is merely mentioned by way of an example and is not to be considered as a restriction upon my invention, inasmuch as any other suitable material can be employed. These two parts can be made by deep drawing operations, or by forging or casting, or even if desired, by molding from a synthetic thermosetting plastic, like a phenol formaldehyde condensate.

The upper part 34 is open at both ends and therefore consists only of a tubular side wall 42. The lower end of said side wall must be circular and must be of a size such that it can telescopically internest with the upper end of the base part 32. One or the other of these ends, therefore, is slightly larger or smaller than the other end to permit such interengagement. For the sake of appearance, inasmuch as the side wall 36 is frustoconical and upwardly flaring, the side wall 42 likewise is frustoconical and upwardly flaring, being so dimensioned as, when in assembled relationship with the base part, to constitute a smooth continuation of the side wall of the base part. The combined lengths of the two parts, when coupled, is in excess of the overall length of a socket interior, being equal to or greater than the overall length of a socket interior plus the additional space necessary to accommodate a device for securing the socket interior to the cover, whereby when the socket interior is permanently fast in the shell, it is laterally concealed from view by the cover. Accordingly, the axial length of the base part 32 is, unlike the comparatively shallow base part of a present day conventional socket shell, fairly substantial and extends past the switch control for the socket interior. Such mechanisms are standard, consisting for example, of pull chains, turn keys, and push pins.

The upper end of the upper part 34 is sufficiently large to permit the Edison base of an electric light bulb to be inserted therethrough and engage the Edison ferrule of the socket interior.

Suitable means is provided to permit the two parts to be coupled or uncoupled in a fashion such that when coupled, their attachment is particularly secure. Said means further is characterized by the fact that it is rapid-acting, and is of a rotatable character, i.e., necessitating relative rotation between the two parts for engagement or disengagement thereof. The amount of relative rotation is small so as to achieve the desired quick-acting effect, and to this end does not exceed 180° and preferably does not exceed 120°, in the preferred form of my invention being about 90° or less.

Furthermore, in the preferred form of my invention the coupling means is such that when in engaged condition it creates a peripherally distributed axial strain between the two parts, this strain acting as a frictional restraint against relative rotation that inhibits accidental disengagement of the parts and, further, acts to rigidify the connection between the parts of the socket shell.

More specifically, the quick-acting secure rotatable coupling means for the two parts 32, 34 includes a mutilated tubular sleeve 44 integral with and concentrically upstanding from the upper end of the base part 32. Said sleeve provides an annular groove 46 below the top edge thereof. In the present embodiment of my invention said groove is formed by fashioning the sleeve with a frustoconical upwardly flaring shape, the lower end thereof being smaller than the upper end of the side wall 36 and connected thereto by a radial step 48. The effect of this is to provide not only the annular groove 46 but also to make the upper end of the sleeve 44 overhang the groove.

The mutilation of the sleeve 44 consists in providing axial slots 50 therein at equiangular positions, these slots extending from the upper edge of the sleeve to at least the step 48, and in the instance of one slot, to well below said step so as to permit protrusion of the switch control element. Thereby, axial access is provided to the transversely extending annular groove 46.

The coupling means further includes a series of inwardly extending protuberances 52 at the lower edge of the upper part 34. Said protuberances preferably are equal in number to and have the same relative angular spacing as the axial slots 50.

It now will be seen that when it is desired to couple the two parts of the socket shell, the upper part is held above the base part in axial alignment thereof and is turned until the protuberances 52 are in registry with the slots 50. Then the two parts are moved axially together so as to slide the protuberances through the axial slots until they reach the annular groove 46. Then the two parts are relatively rotated so as to force the protuberances to ride along the annular groove and become dis-

placed from the axial slots. In this fully coupled condition the overhanging upper edge of the sleeve 44 prevents the two parts from moving apart axially.

Moreover, the diameter of the circle defined by the innermost portions of the protuberances is slightly smaller than the diameter of the annular groove 46. In addition the protuberances are circumferentially cammed, that is to say, as shown for example in FIGS. 3 and 4, they slope radially inwardly toward their centers from their sides. Hence, as the protuberances initially engage the sleeve 44 at the edges of the slots 50, they will force the same inwardly to a slight extent, thereby constricting the diameter of said sleeve. The sleeve is made sufficiently resilient by the slots to permit such action. Since the sleeve is frustoconical and upwardly flaring, the resultant outward pressure after coupling exerted on the protuberances 52 by the quadrants of the mutilated sleeve will have components one of which is radially outward and the other axially downward towards the bottom wall 38. This latter force strongly presses the bottom edge of the upper part 34 against the annular step 48 so as to secure an extremely rigid connection between the two parts as well as to create a substantial amount of friction opposing relative rotation of said parts. In FIG. 6 the constriction of the sleeve has been somewhat exaggerated in order more clearly to demonstrate the above described action. The camming action, which forces the protuberances axially toward the step 48, is assisted by the angular slope of the protuberances 52 which matches that of the frustoconical sleeve 44.

Desirably, means is included to limit relative rotation of the two parts of the socket shell in order that a user thereof will not, when coupling said parts, turn them so far that they will reach another position wherein the protuberances again are lined up with the slots and the parts will be ready for disengagement. Said means simply can constitute a nipple 54 on one of the quadrants of the sleeve 44 approximately midway between two of the axial slots 50. A protuberance 52 will butt against said nipple as shown in FIG. 3, to define the fully coupled position of the two parts of the socket.

The socket shell shown in FIGS. 1–6 is the simplest form of cover for a socket interior. However, by detaching the upper part 34 and substituting for the same any one of a group of other upper parts, each of which is adapted to be coupled with the base part 32 in the same manner, socket shells having different functions and sundry type of shades or the like supporting means, can be provided without dismounting the base part and socket interior from a lamp or like electric fixture. The actual form and type of upper part that is employed in any given instance will depend upon the use to which the lamp or electric fixture will be put. Moreover, as will be pointed out in greater detail hereinafter, the upper part can be changed even after the lamp has been completely manufactured, and even after it is in the hands of a distributor, retailer or housewife. To illustrate the foregoing, I have, in FIGS. 7, 8, 9 and 10, shown a single lamp base 56 with which different kinds of upper parts of the socket shell have been employed, thereby to change the character and use of the lamp without at any time detaching the socket interior or base part of the socket shell.

Referring to FIG. 7, the lamp base 56 will be seen to constitute a lamp body 58 through which there extends a vertical pipe 60, the upper end of which is threaded. An escutcheon 62 seated on top of the body is provided with a central opening through which the upper end of the pipe protrudes. The base part 32 of a socket shell 30 embodying my invention rests on the escutcheon 62, the threaded end of the pipe projecting through the central opening 40 in said part. Said part is rigidly secured to the pipe, and therefore to the lamp, in any suitable manner. For example, I may utilize for this purpose a hickey 64 of a well known type including a female

threaded annulus 66 which is screwed on the upper end of the pipe 60 to clamp the base part 32 of the socket shell against the escutcheon 62. The hickey also includes an upstanding ear 68 which is secured in any convenient fashion, as by screws, to a socket interior 72.

In the lamp 73 shown in FIG. 7, the upper part 34*a* of the socket shell is identical to the upper part 34 hereinbefore described with respect to FIGS. 1–6, except that it further includes a lamp harp 74 consisting of a wire bail 76, a swivel 78, and a finial 80. The lower ends of the bail are located within the upper part 34*a* in diametrically opposite positions and are permanently attached thereto, e.g., by welding. Thus, when the upper part 34*a* is coupled to the base part 32, the harp is in place ready to support the hub 82 of a spider-type shade support from the periphery of which a lamp shade 84 is suspended. The swivel, finial, hub and spider are of standard construction.

In effect, the base part 32 and upper part 34*a* constitute a dismountable harp, that to say, a harp which can be detached from its support. This type of harp is used, for example, to save shipping space, and is widely employed in the lamp industry.

However, if a lamp manufacture makes a conventional lamp with a harp-type shade support, or if such a lamp has been shipped to a distributor or retailer, it ordinarily would not be possible to change the manner of support for the element, e.g., reflector of lamp shade, which is used to diffuse light emanating from the bulb. But, due to the utilization of my invention, the lamp 73 can be modified after manufacture without removing the socket. In FIG. 8 I have shown a lamp 85 as thus modified. The upper part 34*a* has been uncoupled from the base part 32 and in lieu thereof a different upper part 34*b* has been engaged with said base part. The upper part 34*b* is identical to the upper part 34 except that it includes an inturned flange 86 which tends to conceal the upper part of the socket interior. The lamp 85 includes a lamp shade 88 which is directly supported from the electric light bulb 90 by a conventional spring clip 92, hub 94 and spider 96.

It readily will be appreciated that even though the lamp 73 shown in FIG. 7 is shipped out with the lamp harp 76 forming part of the socket shell, it can, in the hands of the retailer, distributor, or ultimate consumer, quickly and easily be changed to a different type of lamp simply by detaching the upper part 34*a* of the socket shell and for it, by way of example, substituting the upper part 34*b* while at the same time adding the spring clip 92 and the associated hub 94 and spider 96.

The lamp 73 also can be changed to provide a bowl-type diffusor and shade lamp 97 as illustrated in FIG. 9. Said lamp 97 includes an upper part 34*c* for the socket shell, this upper part being higher than the upper parts 34, 34*a*, and 34*b* so as partially to embrace the lower half of the envelope for the electric light bulb. The upper part 34*c*, like the parts 34, 34*a* and 34*b*, is of frustoconical configuration and is quick-detachably couplable with the base part 32. Near the top rim of the upper part 34*c* I provide a set of tapped openings 98 adapted to receive the threaded shanks of screws 100, the tips whereof engage an annular recess 102 in the neck in a conventional diffusor bowl shade holder 104. A set of spider arms 106 rest on the wide upper end of the shade holder 104, and in turn support a lamp shade 108. Thus, by substituting the upper part 34*c* for the upper part 34, 34*a*, or 34*b*, I can transform a lamp into one utilizing a bowl-type shade holder.

FIG. 10 illustrates a lamp 109 having still another type of substitute upper part for the socket shell. As illustrated in this figure, said upper part 34*d* is provided, adjacent its upper end, with an annular ridge 110 to which there are secured, as by peening, a series of radially extending spider arms 112 which terminate in a hoop 114 to which a lamp shade 116 is secured. The upper part

34*d* like the previous upper parts, can be quick-detachably coupled to the base part 32.

The foregoing upper parts have been illustrated and described as examples only of the various types of upper parts that can be employed in conjunction with my invention, and it will be understood by experienced workers in the lamp field that any other type of shade, bowl or the like holder, can be incorporated in said upper part whereby to enable the same to be coupled with the base part and conjointly to provide a lamp of any other desired type. All of these lamps will be characterized by the extremely firm and sturdy quick-detachable connection between the two parts of the socket shell whereby a lamp shade or the like is securely held in place, will not wobble and will not become unsteady if accidentally hit or twisted.

In FIG. 11, I have shown my invention as embodied in a floor lamp of the torch type. Here, the upper part 34*e* is the same as the upper part 34*c*. However, the screws 100 engage an annular groove 118 in a shallow bowl reflector 120. In lamps of this type the upper part 34*e* in conjunction with the base part 32 defines an ornamental husk and it often will be desirable to change the upper part 34*e* so as to secure some desired variation in design. The distributor and retailer therefor is not obliged to carry a large stock of lamp stands 121 on the premises and simply sells to the customer a suitable upper part 34*e* which will satisfy some particular artistic taste.

From the above description it will be clear that my invention is practiced by providing a single standard type of base part 32 which is designed to form a permanent non-removable (except by disassembly) part of a lamp, and any one of a group of upper parts adapted to be rapidly detachably attached to said base part, and when attached, to be rigidly and firmly secured thereto, the upper parts having different designs and being adapted to support different types of lamp shades or the like. However, it will be understood that my invention is not limited for the single base part to the specific base part disclosed, inasmuch as other base parts can be utilized which achieve the same purpose and individually are capable of being used with any one of a group of upper parts which are rapidly detachably coupled to such base part in accordance with my invention. For instance, one such different single base part 122 is illustrated in FIG. 12. This base part is essentially similar to the base part 32 and only differs therefrom in that for three of the slots 50 of the base part 32, I have substituted externally concave grooves 124 which permit the protuberances 52 to be axially slid downwardly to the anular groove 46 as explained with reference to FIGS. 1–6. The remainder of the base part 122 and upper part 34*a* will not be described inasmuch as they are identical to the base part 32 and the upper part 34.

It will be appreciated that the base part is upwardly flaring. Quite often it is desirable to treat these base parts en masse; for example, during burnishing or plating. At such times, due to the configurations of such base parts, one part may become nested in another thereby preventing effective treatment of the nested part. To prevent this from occurring, I may provide the base part with internally projecting tabs such, for instance, as the tabs 51 illustrated in FIG. 1. Inasmuch as the smallest circle that can be inscribed within the tips of these tabs is about equal to or smaller than the diameter of the bottom of the base part, the aforesaid nesting is prevented. These tabs also may function to guide the socket into place.

It thus will be seen that I have provided socket shells which achieve the various objects of my invention and are well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention and as various changes might be made in the embodiments above set forth, it is to be understood that all matter herein described or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. An electric socket shell of the character described, consisting of:

two tubular parts having central axes,

one of said parts constituting a one-piece cup-shaped base part with an apertured bottom wall for connection to an electric lighting device as a permanent part thereof and for permanent association with a socket interior in axial alignment with the base part,

said base part being shorter than the socket interior whereby the base part cannot completely conceal the socket interior,

the other of said parts constituting a one-piece sleeve-shaped upper part rotatably couplable in partially telescoping end-to-end relationship with said base part,

said two parts solely cooperating to jointly provide a complete cover for the socket interior, and

rapid-acting detachable means engageable upon the partial telescoping of the two parts and relative rotation of said parts about their central axes for axially compressively securing said two parts to one another,

said means including

a radially outwardly overhanging external annular cam surface forming an integral element of one of said parts and sloping longitudinally of said one part,

said cam surface including a substantially longitudinal cut-out entry slot leading from an open end of said one part,

a radially inwardly directed protuberance comprising a follower forming an integral element of the other of said parts and adapted to be moved longitudinally through the entry slot to engage the cam surface when the two parts are coupled and relatively rotated,

said cam and follower cooperating upon said coupling and relative rotation to relatively move the two parts into further telescoping relationship,

and a pair of abutment members one of which is formed integrally with one of the parts and the other of which is formed integrally with the other parts,

at least one of said abutment members being annular and being positioned in a plane perpendicular to said central axes,

said abutment members being positioned with respect to the cam and follower to longitudinally abut one another when the cooperation between the follower and cam upon coupling and relative rotation of the two parts causes said two parts to move further into telescoping relationship, whereby to couple the two parts to one another under pressure in said longitudinal direction, the base part being of frusto-conical configuration with a wide upper open end, said upper end including a frusto-conical portion of reduced diameter terminating in a step, said portion constituting the cam surface and said step constituting the annular abutment member, said portion being provided with slots extending to the upper edge thereof and which constitute the entry slots, the upper part including protuberances which constitute the followers and which are adapted to be slid through the entry slots

to reach the lower end of the frusto-conical portion, said protuberances and frusto-conical portion being dimensioned and contoured for the frusto-conical portion to cam the protubrances so as to press the lower edge of the upper portion against the step, said lower edge constituting the other abutment member.

2. A socket shell as set forth in claim 1 wherein the base part includes tabs extending radially inwardly from the bottoms of the slots.

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