

[54] **TUBE LIGHT HAND LAMP**
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[52] U.S. Cl. **240/11.4 R, 240/51.11 R**
[51] Int. Cl. **F21L**
[58] Field of Search **240/11.4 R, 51.11 R, 54 A, 240/12; 339/51, 53, 54, 56**

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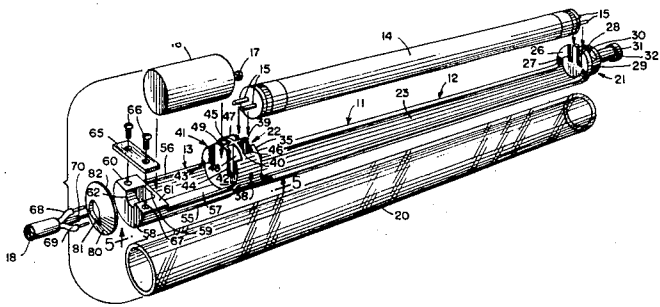
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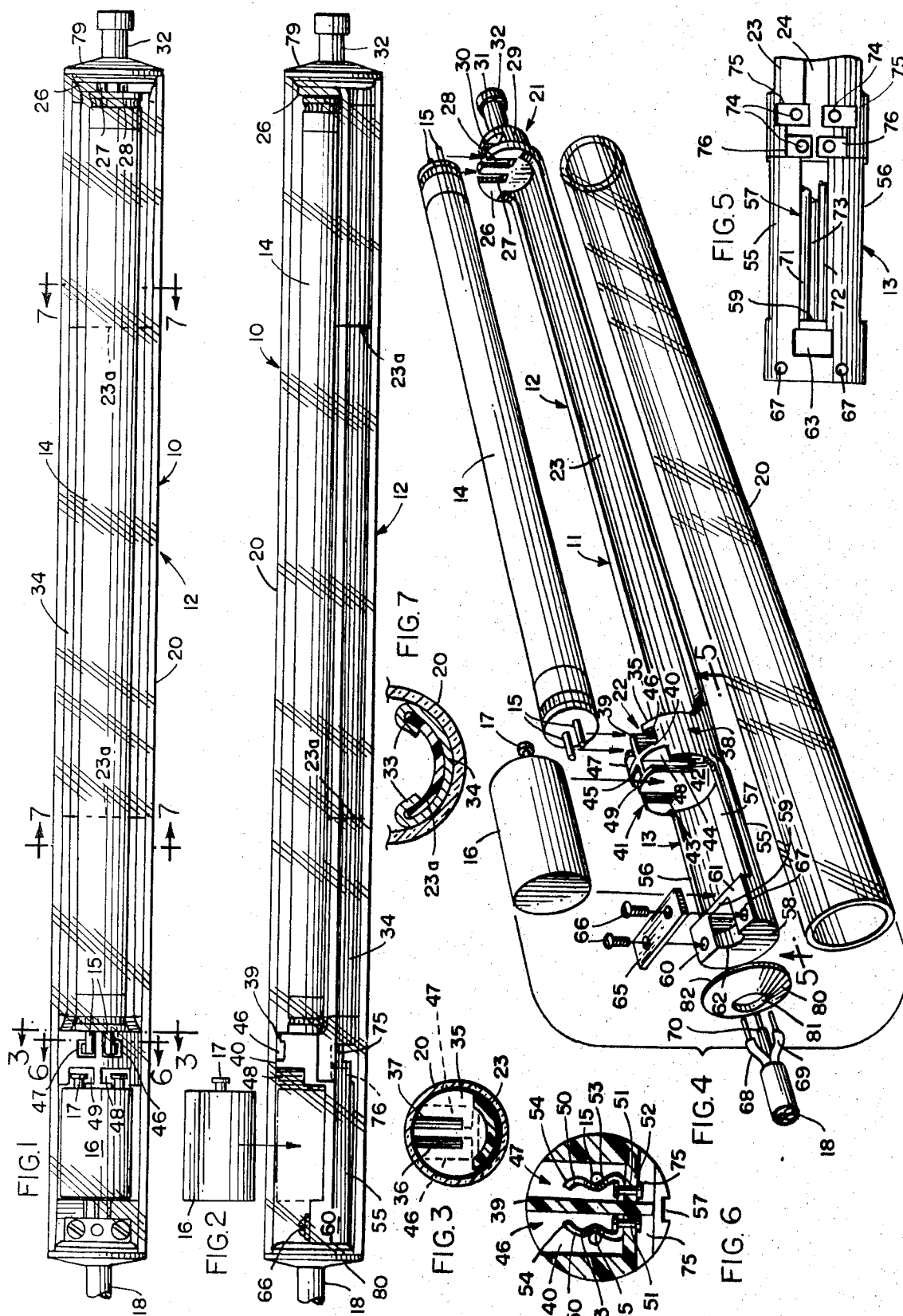
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[57] **ABSTRACT**

A hand lamp with a fluorescent light tube having an elongated base with axially aligned light tube and lamp starter cradle portions, preferably made as an integral, plastics molding with slotted sockets receiving the electrical contact pins of a fluorescent light tube and a starter therefor, a light transmitting, envelope tube slidably fitted over the base in encasing relationship about said base and an elongated light tube and cylindrical starter mounted in said cradle portions, and elastomer discs closing the open ends of the envelope tube.

4 Claims, 7 Drawing Figures





TUBE LIGHT HAND LAMP

The invention herein concerns improvements in hand lamps utilizing a tube light such as a fluorescent light. These lamps have a number of practical uses. These lamps are readily insertable through relatively small openings, whereby they are adapted for the lighting of the interior of barrels, drums, mixing vessels, chemical reaction vessels, boilers and the like. Further, because of their rod-like shape, they are handy lights for use by personnel involved in the repair and/or installation of parts of diverse types of machines and apparatus — particularly where the installation or repair involves working in close quarters.

The subject invention provides improvements in hand lamps of the aforesaid type by providing an elongated base having an elongated light tube cradle portion with lamp socket means at the respective ends thereof and, in axial alignment with the light tube cradle portion, a lamp starter cradle portion with socket means for the lamp starter, preferably in back-to-back relationship with one of the socket means for the lamp tube. A light transmitting, envelope tube is slidably fitted over the base in encasing relationship with the base and the elongated light tube and cylindrical starter respectively mounted in the cradle portions. The open ends of the envelope tube preferably are closed by elastomer discs or caps in a manner making the envelope tube substantially waterproof.

The illustrated light tube cradle portion is an elongated bar, which preferably is transversely arcuate, having all members extending across each end of the bar and forming socket means for the lamp tube. The respective socket means have slotted walls contiguous to the ends of the bar. These slots preferably extend from the periphery of the slotted walls on the side thereof remote from the bar in a direction toward the bar. The slots are adapted to receive the electrical contact pins projecting from the opposite ends of the light.

The wall members forming the socket means have small pockets or wells in which are mounted contact blades forming the electrical contacts with the aforesaid contact pins. Such blades preferably are metal leaf springs mounted in the wells or pockets with the free, springable ends extending substantially parallel with the slots. The leaf springs have a bent portion forming a detent adapted to hold the pins of the light tube securely against accidental displacement and form contacts engageable and disengageable with the pins upon sliding of the pins into and out of the respective slots.

The socket means for the lamp starter comprises a similar arrangement of wall members forming wells or pockets in which are mounted leaf spring contact blades of the same type as heretofore described. The wall members forming this socket means are located in back-to-back relationship with one of the lamp tube socket means. The slots in one of the wall members slidably receive electrical contact pins projecting from an end of a cylindrical starter while the leaf spring contact blades provide electrical contact with the starter pins and releasably hold the starter in its socket means in the manner aforesaid with respect to the lamp tube pins.

The elongated bar forming the light tube cradle portion preferably has a longitudinal groove in its outer, convex wall. This groove receives and accommodates electrical wires extending to the light tube socket

means remote from the lamp starter cradle portion of the base. The lamp starter cradle portion preferably comprises two longitudinal bars with a narrow, longitudinal space therebetween, the latter adapted to receive and accommodate electrical wires. The two longitudinal bars have means, e.g., a screw-held bar across a semi-cylindrical passage, forming a clamp to securely hold the electrical cable or wire at the wire entrant end of the hand lamp. Wires connecting the electrical cable or wire with the lamp starter contact blades and the light tube contact blades extend through and are accommodated by the aforesaid narrow, longitudinal space between the two longitudinal bars.

THE DRAWINGS

Preferred embodiments of the invention are illustrated in the drawings wherein:

FIG. 1 is a top plan view of a first embodiment of a hand lamp of the invention;

FIG. 2 is a side elevation thereof;

FIG. 3 is a section view taken on section plane 3—3 of FIG. 1 with the light tube removed;

FIG. 4 is a perspective, exploded view of a second embodiment of a hand lamp;

FIG. 5 is a fragmentary bottom plan view of the starter cradle end of the hand lamp base of FIG. 4;

FIG. 6 is a section view taken on section plane 6—6 of FIG. 1; and

FIG. 7 is a section view taken on either section plane 7—7 of FIG. 2.

THE ILLUSTRATED EMBODIMENTS

The two illustrated embodiments are essentially identical except for the structure of the elongated bar forming the light tube cradle portion, the latter being a one-piece molded plastic construction in the embodiment of FIG. 4 and a multi-piece construction in the embodiment of FIGS. 1 and 2. Accordingly, with the exception of the light tube cradle portion, like numerals designate like parts in both illustrated embodiments.

The invention provides a tubular hand lamp 10 having a base 11 preferably comprising an integral, one-piece molding of a thermoplastic polymer or resin. The base 11 has a light tube cradle portion 12 and a lamp starter cradle portion 13 in axial alignment. A cylindrical light tube 14, e.g., a tubular fluorescent lamp, having conventional electrical contact pins 15 projecting from the caps at opposite ends thereof is cradled in the cradle portion 12. A cylindrical lamp starter 16 of conventional construction used for igniting fluorescent tubes having a pair of contact pins 17 extending from one end thereof is cradled in the cradle portion 13 of the base 11.

Electrical current is supplied to the hand lamp 10 by the electrical cable 18, which may be a two-wire or three-wire cable. The cable 18 has, at its lamp remote end, a conventional electrical plug (not shown) and also has in its intermediary cable portion a conventional lamp ballast (not shown) used in electrical circuits for fluorescent lamps.

The elongated base 10, including its cradle portions 12 and 13, and the cylindrical light tube 14 and cylindrical starter 16 are encased in a light-transmitting, envelope tube 20 made of a transparent synthetic polymer or resin, or less preferably, of glass. The base 11 has thereon at the cable-remote end a transverse wall unit 21 having a generally circular configuration

adapted to fit within the envelope tube 20. The base 11 has near the cable entrant end, and preferably intermediate the respective ends of the base 11, a second transverse wall unit 22, also of generally circular configuration adapted to fit within the envelope tube 20. The two transverse wall units 21 and 22 provide socket means adapted to house electrical contact blades and to receive the respective pins 15 and 17 of the light tube 14 and starter 16 in contacting relationship with the contact blades. The structures of the socket means are described in detail hereinafter.

The light tube cradle portion 12 preferably comprises a transversely arcuate bar 23 having in its outer, convex face a longitudinal groove 24. This groove serves the function of receiving electrical wires which extend to the socket means in the transverse wall unit 21. For the sake of most clear illustration of the invention, these wires and also the wires in the respective socket means have not been depicted. The wiring, however, is conventional wiring used in fluorescent tube lighting lamps and/or fixtures.

The transverse wall unit 21 comprises a substantially circular transverse wall 26 contiguous to the cable-remote end of the bar 23. The wall 26 has a pair of parallel slots 27, 28 extending inwardly from the bar-remote edge of the transverse wall 26. The wall unit 21 further embodies a frusto-conical (or conical), hollow chamber 29 which is open on the bar-remote side. The chamber 29 has a diametrical wall 30 subdividing the chamber 29 into two, open subchambers 31 in which are located respectively the contact blades adapted to make electrical contact with the two pins 15 of the light tube 14.

If desired, the transverse wall unit 21 may further include an axially projecting stud 32 molded integrally therewith. This stud provides a means for the screw-mounting of a mirror (not shown) on the end of the hand lamp 10. Such mirrors are commonly used with hand lamps of the subject type for the inspection of the interior of barrels, drums, vessels and the like, or other places of difficult access by reflecting through the access opening or space the surfaces or items illuminated by the hand lamp after its insertion.

In the embodiment of FIGS. 1 and 2, the light tube cradle portion 12 comprises two segments of the light tube cradle portion 12 illustrated in FIG. 4, which segments are derived by cutting or sawing the cradle portion 12 of FIG. 4 transversely to provide separate, transversely arcuate, bar segments 23a. The segments 23a are connected together in axial alignment by an elongated, metal, transversely arcuate strip 34 which overlaps the respective segments 23a. As shown in FIG. 7, the strip 34 has reverse bend, longitudinal edges 33 which are crimped over the longitudinal edges of the respective bar segments 23a. This construction of the light tube cradle portion has a certain advantage in that the light tube cradle portions 12 may be made of a single length in the form of a unitary plastics molding as shown in FIG. 4 in a manner accommodating the shortest fluorescent light tube 14. For longer light tubes 14, the unitary molding of FIG. 4 is simply cut or sawed as aforesaid and the longer length tube is accommodated by use of the strip 34, which bridges the gap between the two segments 23a. It is, of course, contemplated by the invention that hand lamps of the subject invention may be made for various length lamp tubes in a series

of unitary moldings like FIG. 4 with different length lamp tube cradle portions.

The socket means of wall unit 22 comprises a circular wall 35 similar to the circular wall 26. It has pin-receiving slots 36 and 37 extending from the bar-remote edge of the circular wall 35 toward the bar 23. The sockets are formed within a substantially cylindrical body 38 and are formed by a diametric wall 39 and rear wall 40. The rear wall is a common wall between the light tube pin socket means of wall unit 22 and the lamp starter socket means 41, said socket means thereby being in back-to-back relationship.

The socket means 41 is formed by a substantially circuit front wall 42 having starter pin-receiving slots 43 and 44 of the same nature and orientation as the slots 27, 28 and 36, 37. The socket means 41 has a diametric wall 45 coplanar with the diametric wall 39. The respective walls form within the substantially cylindrical body 38, four pin-receiving sockets 46, 47, 48 and 49.

The socket means for receiving the pins 15 and 17 of the light tube 14 and starter 16 are substantially identical. For purposes of illustration of the respective socket means, the socket means shown in detail in FIGS. 3 and 6 will suffice.

The contact blades 50 have base portions secured by rivets 51 to the bottom wall 52 of the sockets 46 and 47. The wiring for the lamp (not shown as aforesaid) is soldered or otherwise secured with good electrical contact to the blade-remote ends of the rivets 51. Each contact blade 50 preferably is made of a strip of spring metal having its springable portion extending in parallel-like fashion to the pin-receiving slots, in the illustrated case, slots 36 and 37. The springable portion of the contact blades have a detent bend 53 in which the pins 15 (or 17) are seated. The detent bends 53 hold the pins against accidental displacement from contacting relationship with the blades 50. The outer, free ends of the contact blades 50 have reversely bent, tip portions 54 functioning as cam surfaces to push the blades 50 toward the divider wall 39 when the contact pins 15 (or 17) are inserted into the respective sockets. This blade construction, coupled with the orientation of the pin-receiving slots 27, 28 and 36, 37 and 43, 44, facilitate ready, secure mounting of the light tube 14 and starter 16 in the tubular hand lamp and also make removal thereof relatively simple when the envelope tube 20 is slid off the base 11.

The lamp starter cradle portion 13 is illustrated in detail in FIGS. 4 and 5. In the preferred form of its construction, the cradle 13 comprises a pair of transversely arcuate, spaced bars 55 and 56 providing wall means nesting about one half of the cylindrical starter 16 therein. The space 57 therebetween is provided to accommodate wires on the hand lamp as hereinafter described. The cable-receiving end of the cradle portion 13 is a semi-cylindrical plastic body 58 having a narrow, semicircular rear wall 59. The semi-cylindrical body 58 has a pair of diametric cross walls 60, 61, between which is provided a semi-circular, transverse wall 62 configured to receive the sheathed portion of the cable 18. Between the rear wall 59 and the semi-cylindrical wall 62 is a rectangular passage 63 through which the individual wires of the cable may pass.

The cable 18 is secured firmly to the hand lamp 10 by placing it in the semi-cylindrical wall portion 62 and thereafter placing over the cable the cable clamp plate

65, which preferably is made of a dielectric and substantially rigid material. The plate 65 is secured to the semi-cylindrical body 58 by screws 66 threaded into the holes 67 in the body 58.

In the embodiment illustrated in FIG. 4, the electrical wire cable 18 has three wires 68, 69 and 70, one of which is a ground wire. These wires extend through the rectangular passage 63 to a point where they are connected with the lamp wires 71, 72 and 73 (shown only in fragment in FIG. 5). The latter wires lie in side-by-side relationship in the space 57 between bars 55 and 56. They are connected with the respective rivets 51 of the contact blades 50 by mounting of the rivets 51 in the holes 74 within the well pairs 75 and 76 directly opposite the respective sockets 46, 47 and 48, 49. The wires 71-73, or other wires electrically secured thereto, extend longitudinally through the groove 24 to the contact blades in the transverse wall unit 21.

The open ends of the envelope tube 20 are closed by mounting therein elastomer disc caps 79 and 80. Each disc cap has a coaxial hole 81, the walls of which respectively tightly fit about the sheathed portion of the cable 18 and the stud 32. Inner, ring or flange portions 82 of the respective disc caps tightly fit against the inner periphery of the envelope tube 20, whereby the disc caps 79 and 80 and the envelope tube 20 provide a substantially watertight enclosure for the hand lamp 10.

It is thought that the invention and its numerous attendant advantages will be fully understood from the foregoing description, and it is obvious that numerous changes may be made in the form, construction and arrangement of the several parts without departing from the spirit or scope of the invention, or sacrificing any of its attendant advantages, the forms herein disclosed being preferred embodiments for the purpose of illustrating the invention.

The invention is hereby claimed as follows:

1. A hand lamp for a tube lamp with contact pins on opposite ends thereof comprising (a) an elongated molded polymer base having as integrally molded parts thereof an elongated light tube cradle formed by circular wall means at opposite ends of a transversely arcu-

ate bar, said circular wall means respectively having lamp tube pin socket means; said base further having a lamp starter cradle axially aligned with said light tube cradle and formed by transversely arcuate wall means adapted to nest approximately one half of a cylindrical starter to be mounted therein with one of said circular wall means at one end and semi-circular wall means at the opposite end of said transversely arcuate wall means, said one of said wall means including a slotted circular wall with starter contact pin-receiving slots therein; (b) a single, light-transmitting, cylindrical, envelope tube having a length slightly longer than the length of said base and slidably, frictionally fitted around said base in encasing relationship about said base, an elongated light tube mounted in said light tube cradle, and a cylindrical starter mounted in said starter cradle; (c) a cap closing each end of said envelope tube, the cap adjacent said semi-circular wall means having an axial hole for passage therethrough on an electrical cable for said lamp, and (d) said semi-circular wall means having a semi-circular passage receiving said electrical cable, and a bar held by screws across said semi-circular passage and holding said cable in said passage.

2. A hand lamp as claimed in claim 1, said socket means of said circular wall means having lamp contact pin-receiving slots extending away from said transversely arcuate bar, and lamp pin-contact blades mounted in respective circular wall means and adapted to make electrical contact with said pins.

3. A hand lamp as claimed in claim 1, said transversely arcuate wall means of said lamp starter cradle being two transversely arcuate bars with a narrow, longitudinal space therebetween, and the wires of said cable extending through said longitudinal space to pin-contact blades in said one of said circular wall means.

4. A hand lamp as claimed in claim 1, said transversely arcuate bar of said light tube cradle having a longitudinal, wire-receiving groove in its outer, convex face.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,833,801 Dated September 3, 1974

Inventor(s) Tony Trevithick

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

Column 1, line 31, "all" should read --wall--.

Column 4, lines 13 and 14, "circuit" should read --circular--.

Column 6, line 27, delete "away".

Column 6, line 27, after "from" insert --the bar remote edge of said circular wall means toward--.

Signed and sealed this 7th day of January 1975.

(SEAL)
Attest:

McCOY M. GIBSON JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents