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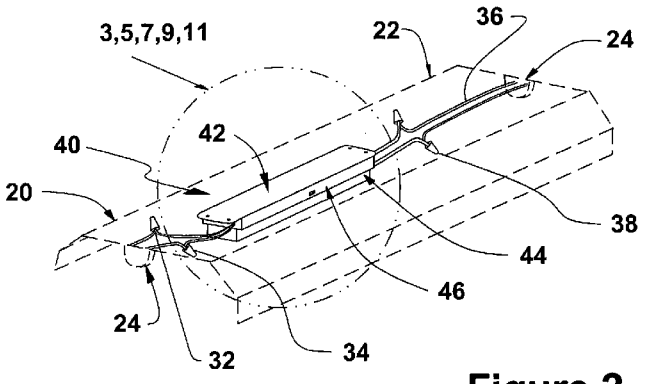

Figure 2

(57) **Abstract**: A combination (40) for replacing a ballast (144, 244, 344, 444) of a conventional fluorescent fixture (20) without ever having to wire the ballast (144, 244, 344, 444) to the conventional fluorescent fixture (20), wherein the conventional fluorescent fixture (20) has a conventional hood (22), a conventional set of power supply wires (32), and a conventional set of lamp socket wires (36). The combination includes a socket (142, 242, 342, 442), a ballast (144, 244, 344, 444), and apparatus (146, 246, 346, 446) for electrically, mechanically, and interchangeably connecting the ballast (142, 242, 342, 442) to the socket (144, 244, 344, 444) without ever having to wire the ballast (144, 244, 344, 444) to the conventional fluorescent fixture (20). The socket mounts to the conventional hood (22) of the conventional fluorescent fixture (20), is electrically spliced to the conventional set of power supply wires (32) of the conventional fluorescent fixture (20), and is electrically spliced to the conventional set of lamp socket wires (36) of the conventional fluorescent fixture (20). The ballast (144, 244, 344, 444) is electrically, mechanically, and interchangeably connected to the socket (142, 242, 342, 442) so as to allow the ballast (144, 244, 344, 444) to be replaced without ever having to wire the ballast (144, 244, 344, 444) to the conventional fluorescent fixture (20).

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COOPERATING ELECTRICAL BALLAST AND SOCKET

1. Cross Reference to Related Applications

The instant application contains subject matter disclosed in applicant's Provisional Application No. 61/402,442 filed on Aug. 30, 2010, titled STREAMLINED BALLAST SYSTEM which is presently copending and accordingly it is respectfully requested that this application be accorded the above priority date of Aug. 30, 2010 for any common matter, under Title 35 USC 119(e).

2. Background of the invention.

A. Field of the invention.

The embodiments of the present invention relate to a ballast for a fluorescent fixture, and more particularly, the embodiments of the present invention relate to a combination for replacing a conventional ballast of a conventional fluorescent fixture without ever having to un-wire an old ballast and re-wire a new ballast into the conventional fluorescent fixture every time a ballast fail and is in need of replacement.

B. Description of the prior art.

Fluorescent lamps require a ballast to stabilize the current through the lamp, and to provide the initial striking voltage required to start the arc discharge. Electromagnetic ballasts with a minor fault can produce an audible humming or buzzing noise. Magnetic ballasts are usually filled with a tar-like potting compound to reduce emitted noise.

Numerous innovations for ballast-related fluorescent lights have been provided in the prior art, which will be described below in chronological order to show advancement in the art, and which are incorporated herein by reference thereto. Even though these innovations may be suitable for the specific individual purposes to which they address, nevertheless, they differ from the present invention in that they do not teach a combination for replacing a conventional ballast of a conventional fluorescent fixture without ever having to wire the ballast to the conventional fluorescent fixture.

(1) *United States Patent Number 3,183,346 to Spaulding et al.*

United States Patent Number 3,183,346 issued to Spaulding *et al.* on May 11, 1965 in U.S. class 240 and subclass 25 teaches a cantilever type fluorescent lighting fixture including an elongate rigid head end plate having a ballast chamber extending longitudinally thereof, an elongate lamp housing having an end fixed to the end plate for support of the housing in cantilever fashion, attachment apparatus on the end plate for attachment thereof to a support,

and an elongate electrical ballast located within the ballast chamber of the end plate transversely of the lamp housing axis and in close proximity with the attachment apparatus.

(2) ***United States Patent Number 3,433,887 to Driskell.***

United States Patent Number 3,433,887 issued to Driskell on March 18, 1969 in U.S. class 174 and subclass 63 teaches a plurality of inwardly facing lugs being integrally formed of the hood of mounting apparatus for a lighting fixture of the type which includes a ballast and a lamp-holder. The ballast is supported by a ballast enclosure. A plurality of outstanding bayonets attached to the ballast enclosure are adapted to engage the lugs and thereby connect the ballast holder to the hood. The bayonets are relieved to permit the ballast holder to be disconnected from the hood. An arrangement of annular electrical terminals on a terminal assembly base mounted to the ballast enclosure and horseshoe electrical contacts on a receptacle base supported within the hood permits the electrical circuit for the lighting fixture to be made at the line side of the ballast when the ballast enclosure is connected to the hood and to be broken thereat when the ballast enclosure is disconnected from the hood.

(3) ***United States Patent Number 4,931,914 to Quiogue.***

United States Patent Number 4,931,914 issued to Quiogue on June 5, 1990 in U.S. class 362 and subclass 265 teaches a light fixture including separate ballast and optical housings. The optical housing includes an open top, a hollow base depending from the open top, and a wiring chamber extending laterally from the hollow base adjacent to the open top. A cover is releasably coupled to the housing, extends over the open top, and has an aperture extending through it receiving a lens. The lamp is mounted in the base of the optical housing for directing light through the lens. The ballast housing is releasably coupled to the optical housing at the wiring chamber. A ballast cover is coupled to the ballast housing. An electrical ballast assembly is mounted in the ballast housing. Wiring extends between the housings for electrically connecting the lamp and the electrical ballast assembly.

(4) ***United States Patent Number 5,292,260 to Sinisi et al.***

United States Patent Number 5,292,260 issued to Sinisi *et al.* on March 8, 1994 in U.S. class 439 and subclass 441 teaches an electrical ballast connector that offers a way to extract electrical conductors therefrom. The connector includes a dielectric housing having a plurality of cavities therein extending between a contact loading face and a conductor receiving face. The conductor receiving face includes an aligned row of conductor openings of a like plurality. Each opening includes a lateral slot in communication with the cavities. A stamped electrical contact is provided within each cavity. The contact includes a base and a pair of spaced-apart arms upstanding therefrom. The inner edge of a first arm is aligned with its corresponding conductor opening. The other arm includes an angular extension directly downwardly and toward the first arm. The end most edge of the other arm is aligned with, and exposed to, its

corresponding conductor opening. At least a portion of the angular extension is exposed to its corresponding lateral slot, whereby an extraction member is received in the lateral slot to laterally flex or pivot the angular extension to provide a free path for the electrical conductor so as to remove the electrical conductor from contact with the inner edge. Finally, anti-over-stressing apparatus is provided to limit the flexing or pivotal action of the angular extension.

(5) *United States Patent Number 5,908,235 to Petrozello et al.*

United States Patent Number 5,908,235 issued to Petrozello *et al.* on June 1, 1999 in U.S. class 362 and subclass 260 teaches an integrated and electronic fluorescent ballast fixture that includes an electronic ballast packaged with a set of fluorescent lamp connectors into an integral fixture. The fixture has a circuit board that selectably supports up to four fluorescent lamps. The housing of the fixture is configured to receive a number of lamp connectors. The connectors are electrically connected to the circuit board using wire and poke-in type connectors. When used with conventional straight fluorescent lamps, a second set of sockets at the far end of the lamps are also connected to the circuit board using wires received in poke-in connector on the circuit board. The integrated ballast package also works with U-shaped lamps. The housing of the fixture is shaped to accommodate projecting electronic ballast components attached to the circuit board. The transformers and transistors of the circuit board are thermally sinked so that their heat is carried to the housing by a thermally conductive apparatus. The housing has two halves that are assembled together with snap-in action latches making the fixture quickly and easily fabricated.

(6) *United States Patent Number 6,102,550 to Edwards, Jr.*

United States Patent Number 6,102,550 issued to Edwards, Jr. on August 15, 2000 in U.S. class 362 and subclass 221 teaches a bracket system for fluorescent lighting fixtures using tubular bulbs and a ballast assembly for mounting on the brackets. Each of a pair of opposing brackets includes a main bracket section and at least two bulb-mounting/ connecting ends that receive tubular fluorescent light bulbs therein and that electrically connect the light bulbs with the ballast-generated, high-frequency driving current. The ballast housing is adapted for quick-connection to and disconnection from the main bracket section. Contact pads are provided to each of the main bracket section and the ballast housing. Conventional AC power is received through some of the contact pads for input to the ballast, and high-frequency driving current is transmitted from the ballast back to other contact pads for distribution to the underlying bracket bulb-mounting/connecting ends and to those of the opposing bracket. The bulb-mounting/connecting ends are mountable slidably on the main bracket section and can also pivot relative to the main bracket section.

(7) ***United States Patent Number D550,154 to Pickard.***

United States Patent Number D550,154 issued to Pickard on September 4, 2007 in U.S. class D13 and subclass 110 teaches the ornamental design for lighting ballast.

It is apparent that numerous innovations for ballast-related fluorescent lights have been provided in the prior art, which are adapted to be used. Furthermore, even though these innovations may be suitable for the specific individual purposes to which they address, nevertheless, they would not be suitable for the purposes of the embodiments of the present invention as heretofore described, namely, a combination for replacing a conventional ballast of a conventional fluorescent fixture without ever having to wire the ballast to the conventional fluorescent fixture.

3. Summary of the invention.

Thus, an object of the embodiments of the present invention is to provide a combination for replacing a conventional ballast of a conventional fluorescent fixture without ever having to wire the ballast to the conventional fluorescent fixture, which avoids the disadvantages of the prior art.

Briefly stated, another object of the embodiments of the present invention is to provide a combination for replacing a conventional ballast of a conventional fluorescent fixture without ever having to wire the ballast to the conventional fluorescent fixture, wherein the conventional fluorescent fixture has a conventional hood, a conventional set of power supply wires, and a conventional set of lamp socket wires. The combination includes a socket, a ballast, and apparatus for electrically, mechanically, and interchangeably connecting the ballast to the socket without ever having to wire the ballast to the conventional fluorescent fixture. The socket mounts to the conventional hood of the conventional fluorescent fixture, is electrically spliced to the conventional set of power supply wires of the conventional fluorescent fixture, and is electrically spliced to the conventional set of lamp socket wires of the conventional fluorescent fixture. The ballast is electrically, mechanically, and interchangeably connected to the socket so as to allow the ballast to be replaced without ever having to wire the ballast to the conventional fluorescent fixture.

The novel features considered characteristic of the embodiments of the present invention are set forth in the appended claims. The embodiments of the present invention themselves, however, both as to their construction and to their method of operation together with additional objects and advantages thereof will be best understood from the following description of the specific embodiments when read and understood in connection with the accompanying figures of the drawing.

4. Brief description of the figures of the drawing.

The figures of the drawing are briefly described as follows:

FIGURE 1 is a diagrammatic perspective view of a typical prior art conventional fluorescent fixture;

FIGURE 2 is a diagrammatic perspective view of the combination of the embodiments of the present invention replacing a conventional ballast of a conventional fluorescent fixture without ever having to wire the ballast to the conventional fluorescent fixture;

FIGURE 3 is an enlarged exploded diagrammatic perspective view of the area generally enclosed by the dotted curve identified by **ARROW 3** in **FIGURE 2** of a first embodiment of the apparatus of the combination of the embodiments of the present invention;

FIGURE 4 is an enlarged diagrammatic cross sectional view taken along **LINE 4-4** in **FIGURE 3** but with the socket of the combination of the embodiments of the present invention and the ballast of the combination of the embodiments of the present invention assembled together;

FIGURE 5 is an enlarged exploded diagrammatic perspective view of the area generally enclosed by the dotted curve identified by **ARROW 5** in **FIGURE 2** of a second embodiment of the apparatus of the combination of the embodiments of the present invention;

FIGURE 6 is an enlarged diagrammatic cross sectional view taken along **LINE 6-6** in **FIGURE 5** but with the socket of the combination of the embodiments of the present invention and the ballast of the combination of the embodiments of the present invention assembled together;

FIGURE 7 is an enlarged exploded diagrammatic perspective view of the area generally enclosed by the dotted curve identified by **ARROW 7** in **FIGURE 2** of a third embodiment of the apparatus of the combination of the embodiments of the present invention;

FIGURE 8 is an enlarged diagrammatic cross sectional view taken along **LINE 8-8** in **FIGURE 7** but with the socket of the combination of the embodiments of the present invention and the ballast of the combination of the embodiments of the present invention assembled together;

FIGURE 9 is an enlarged exploded diagrammatic perspective view of the area generally enclosed by the dotted curve identified by **ARROW 9** in **FIGURE 2** of a fourth embodiment of the apparatus of the combination of the embodiments of the present invention;

FIGURE 10 is an enlarged diagrammatic cross sectional view taken along **LINE 10-10** in **FIGURE 9** but with the socket of the combination of the embodiments of the present invention and the ballast of the combination of the embodiments of the present invention assembled together;

FIGURE 11 is an enlarged exploded diagrammatic perspective view of the area generally enclosed by the dotted curve identified by **ARROW 11** in **FIGURE 2** of a fifth embodiment of the apparatus of the combination of the embodiments of the present invention; and

FIGURE 12 is an enlarged diagrammatic cross sectional view taken along **LINE 12-12** in **FIGURE 11** but with the socket of the combination of the embodiments of the present invention and the ballast of the combination of the embodiments of the present invention assembled together.

5. List of reference numerals utilized in the figures of the drawing.

A. Prior art.

20 typical prior art conventional fluorescent fixture

22 conventional hood of typical prior art conventional fluorescent fixture **20**

24 conventional lamp sockets of typical prior art conventional fluorescent fixture **20**

26 conventional ballast of typical prior art conventional fluorescent fixture **20**

28 conventional first set of wires of conventional ballast **26** of typical prior art conventional fluorescent fixture **20**

30 conventional second set of wires of conventional ballast **26** of typical prior art conventional fluorescent fixture **20**

32 conventional set of power supply wires of typical prior art conventional fluorescent fixture **20**

34 conventional first wire nuts, shrink wrap, *etc.*

36 conventional set of lamp socket wires of typical prior art conventional fluorescent fixture **20**

38 conventional second wire nuts, shrink wrap, *etc.*

B. General.

40 combination of embodiments of present invention for replacing conventional ballast **26** of conventional fluorescent fixture **20** without ever having to wire ballast to conventional fluorescent fixture **20**

C. Overall configuration of combination 40.

42 socket for mounting to conventional hood **22** of conventional fluorescent fixture **20**, and for electrically splicing to conventional set of power supply wires **32** of conventional fluorescent fixture **20** and be protected by conventional first wire nuts, shrink wrap, *etc.* **34** and for electrically splicing to conventional set of lamp socket wires **36** of conventional fluorescent fixture **20** and be protected by conventional second wire nuts, shrink wrap, *etc.* **38**

44 ballast

46 apparatus for electrically, mechanically, and interchangeably connecting ballast **44** to socket **42** without ever having to wire ballast **44** to conventional fluorescent fixture **20**

D. Specific configuration of socket 42, ballast 44, and first embodiment of apparatus 46.

(1) *Socket 42.*

48 body of socket **42**

50 rear wall of body **48** of socket **42** for mounting to conventional hood **22** of conventional fluorescent fixture **20**

52 pair of end walls of body **48** of socket **42**

54 pair of side walls of body **48** of socket **42**

56 front wall of body **48** of socket **42**

58 set of power supply wires of socket **42** for electrically splicing to conventional set of power supply wires **32** of conventional fluorescent fixture **20** and be protected by conventional first wire nuts, shrink wrap, *etc.* **34**

60 set of lamp socket wires of socket **42** for electrically splicing to conventional set of lamp socket wires **36** of fluorescent fixture **20** and be protected by conventional second wire nuts, shrink wrap, *etc.* **38**

62 chamber of socket **42**

64 bottom wall defining chamber **62** of socket **42**

66 pair of side walls defining chamber **62** of socket **42**

68 pair of end walls defining chamber **62** of socket **42**

70 first bore of one end wall of pair of end walls **52** of body **48** of socket **42**

72 second bore of other end wall of pair of end walls **52** of body **48** of socket **42**

74 plurality of electrical slots of socket **42**

(2) ***Ballast 44.***

76 body of ballast **44**

78 rear wall of body **76** of ballast **44**

80 pair of end walls of body **76** of ballast **44**

82 pair of side walls of body **76** of ballast **44**

84 front wall of body **76** of ballast **44**

86 plurality of electrical blades of ballast **44**

(3) ***First embodiment of apparatus 46.***

88 pair of through slots of pair of side walls **66** defining chamber **62** of socket **42** of apparatus **46**, respectively

90 pair of recessed portions of pair of side walls **82** of body **76** of ballast **44** of apparatus **46**, respectively

92 pair of tabs of apparatus **46**

94 outer surfaces of pair of tabs **92** of apparatus **46**, respectively

95 free ends of outer surfaces **94** of pair of tabs **92** of apparatus **46**, respectively

96 first protrusions of pair of outer surfaces **94** of pair of tabs **92** of apparatus **46**, respectively, form gripping areas for facilitating squeezing pair of tabs **92** of apparatus **46** into pair of recessed portions **90** of pair of side walls **82** of body **76** of ballast **44** of apparatus **46**, respectively

98 pair of second protrusions of pair of outer surfaces **94** of pair of tabs **92** of apparatus **46**, respectively

E. Specific configuration of second embodiment of apparatus 146.

142 socket
144 ballast
146 apparatus
162 chamber of socket **142**
166 pair of side walls defining chamber **162** of socket **142**
176 body of ballast **144**
178 rear wall of body **176** of ballast **144**
182 pair of side walls of body **176** of ballast **144**
184 front wall of body **176** of ballast **144**
188 pair of through slots of pair of side walls **166** defining chamber **162** of socket **142** of apparatus **146**, respectively
190 pair of recessed portions of pair of side walls **182** of body **176** of ballast **144** of apparatus **146**, respectively
192 pair of tabs of apparatus **146**
193 free ends of pair of tabs **192** of apparatus **46**, respectively
193a pair of handles of pair of tabs **192** of apparatus **146**, respectively
194 pair of outer surfaces of pair of handles **193a** of pair of tabs **192** of apparatus **146**, respectively
196 first protrusions of pair of outer surfaces **194** of pair of handles **193a** of pair of tabs **192** of apparatus **146**, respectively, form gripping areas for facilitating squeezing pair of handles **193a** of pair of tabs **192** of apparatus **146** into pair of recessed portions **190** of pair of side walls **182** of body **176** of ballast **144** of apparatus **146**, respectively
198 pair of second protrusions of pair of outer surfaces **194** of pair of tabs **192** of apparatus **146**, respectively

F. Specific configuration of third embodiment of apparatus 246.

242 socket
244 ballast
246 apparatus
262 chamber of socket **242**
264 bottom wall defining chamber **262** of socket **242**
276 body of ballast **244**
278 rear wall of body **276** of ballast **244**
284 front wall of body **276** of ballast **244**

288 threaded bore of bottom wall **264** defining chamber **262** of socket **242** of apparatus **246**
290 through bore of body **276** of ballast **244** of apparatus **246**
292 wing bolt of apparatus **246**
294 wing head of wing bolt **292** of apparatus **246**

G. Specific configuration of fourth embodiment of apparatus 346.

342 socket
344 ballast
346 apparatus
348 body of socket **342**
356 front wall of body **348** of socket **342**
362 chamber of socket **342**
366 pair of side walls defining chamber **362** of socket **342**
388 threaded bore of one side wall of pair of side walls **366** defining chamber **362** of socket **342** of apparatus **346**
389 hook of other side wall of pair of side walls **366** defining chamber **362** of socket **342** of apparatus **346**
390 bar of apparatus **346**
391 pair of free ends of bar **390** of apparatus **346**
392 pair of through bores of pair of free ends **391** of bar **390** of apparatus **346**, respectively
393 wing bolt of apparatus **346**
394 wing head of wing bolt **393** of apparatus **346**

H. Specific configuration of fifth embodiment of apparatus 446.

442 socket
444 ballast
446 apparatus
462 chamber of socket **442**
464 bottom wall defining chamber **462** of socket **442**
468 pair of end walls defining chamber **462** of socket **442**
476 body of ballast **444**
478 rear wall of body **476** of ballast **444**
480 pair of end walls of body **476** of ballast **444**
488 first pair of magnets of bottom wall **464** defining chamber **462** of socket **442** of apparatus **446**
490 second pair of magnets of rear wall **478** of body **476** of ballast **444** of apparatus **446**

6. Detailed description of the preferred embodiments.

A. Prior art.

Referring now to the figures, in which like numerals indicate like parts, and particularly to **FIGURE 1**, which is a diagrammatic perspective view of a typical prior art conventional fluorescent fixture, a typical prior art conventional fluorescent fixture **20** includes a conventional hood **22**, conventional lamp sockets **24**, and a conventional ballast **26**. The conventional lamp sockets **24** of the typical prior art conventional fluorescent fixture **20** depend from the conventional hood **22** of the typical prior art conventional fluorescent fixture **20**. The conventional ballast **26** of the typical prior art conventional fluorescent fixture **20** has a conventional first set of wires **28** extending from one end thereof and a conventional second set of wires **30** extending from the other side thereof. The conventional first set of wires **28** of the conventional ballast **26** of the typical prior art conventional fluorescent fixture **20** are spliced to a conventional set of power supply wires **32** of the typical prior art conventional fluorescent fixture **20**, and the splices are protected by conventional first wire nuts, shrink wrap, *etc.* **34**. The conventional second set of wires **30** of the conventional ballast **26** of the typical prior art conventional fluorescent fixture **20** are spliced to a conventional set of lamp socket wires **36** of the typical prior art conventional fluorescent fixture **20**, and the splices are protected by conventional second wire nuts, shrink wrap, *etc.* **38**.

B. General.

Referring now to **FIGURE 2**, which is a diagrammatic perspective view of the combination of the embodiments of the present invention replacing a conventional ballast of a conventional fluorescent fixture without ever having to wire the ballast to the conventional fluorescent fixture, the combination of the embodiments of the present invention is shown generally at **40** for replacing a conventional ballast **26** of a conventional fluorescent fixture **20** without ever having to wire the ballast to the conventional fluorescent fixture **20**.

C. Overall configuration of the combination 40.

The combination **40** comprises a socket **42** and a ballast **44**. The socket **42** is for mounting to the conventional hood **22** of the conventional fluorescent fixture **20**, is for electrically splicing to the conventional set of power supply wires **32** of the conventional fluorescent fixture **20** and having the splices protected by the conventional first wire nuts, shrink wrap, *etc.* **34**, and is for electrically splicing to the conventional set of lamp socket wires **36** of the conventional fluorescent fixture **20** and having the splices protected by the conventional second wire nuts, shrink wrap, *etc.* **38**. The ballast **44** is electrically, mechanically, and interchangeably connected to the socket **42** so as to allow the ballast **44** to be replaced without ever having to wire the ballast **44** to the conventional fluorescent fixture **20**.

The combination **40** further comprises apparatus **46** for electrically, mechanically, and interchangeably connecting the ballast **44** to the socket **42** without ever having to wire the ballast **44** to the conventional fluorescent fixture **20**.

D. Specific configuration of the socket 42, the ballast 44, and a first embodiment of the apparatus 46.

The specific configuration of the socket **42**, the ballast **44**, and a first embodiment of the apparatus **46** can best be seen in **FIGURES 3** and **4**, which are, respectively, an enlarged exploded diagrammatic perspective view of the area generally enclosed by the dotted curve identified by **ARROW 3** in **FIGURE 2** of a first embodiment of the apparatus of the combination of the embodiments of the present invention, and an enlarged diagrammatic cross sectional view taken along **LINE 4-4** in **FIGURE 3** but with the socket of the combination of the embodiments of the present invention and the ballast of the combination of the embodiments of the present invention assembled together, and as such, will be discussed with reference thereto.

(1) ***The socket 42.***

The socket **42** comprises a body **48**. The body **48** of the socket **42** is generally rectangular parallelepiped-shaped, and has a rear wall **50**, a pair of end walls **52**, a pair of side walls **54**, and a front wall **56**. The rear wall **50** of the body **48** of the socket **42** is for mounting to the conventional hood **22** of the conventional fluorescent fixture **20**.

The socket **42** further comprises a set of power supply wires **58**. The set of power supply wires **58** of the socket **42** extend outwardly from one end wall **52** of the body **48** of the socket **42**, are for electrically splicing to the conventional set of power supply wires **32** of the conventional fluorescent fixture **20**, and have the splices protected by the conventional first wire nuts, shrink wrap, *etc.* **34.**

The socket **42** further comprises a set of lamp socket wires **60**. The set of lamp socket wires **60** of the socket **42** extend outwardly from the other end wall **52** of the body **48** of the socket **42**, are for electrically splicing to the conventional set of lamp socket wires **36** of the conventional fluorescent fixture **20**, and have the splices protected by the conventional second wire nuts, shrink wrap, *etc.* **38**.

The socket **42** further comprises a chamber **62**. The chamber **62** of the socket **42** extends inwardly from, and opens into, the front wall **56** of the body **48** of the socket **42**, to short of the rear wall **50** of the body **48** of the socket **42**.

The chamber **62** of the socket **42** is generally rectangular parallelepiped-shaped, similarly to that of the body **48** of the socket **42** but smaller, and is defined by a bottom wall **64**, a pair of side walls **66**, and a pair of end walls **68**.

The one end wall **52** of the body **48** of the socket **42** has a first bore **70**. The first bore **70** of the one end wall **52** of the body **48** of the socket **42** has the set of power supply wires **58** of

the socket **42** extending outwardly therethrough for electrically splicing to the conventional set of power supply wires **32** of the conventional fluorescent fixture **20** and have the splices protected by the conventional first wire nuts, shrink wrap, *etc.* **34**.

The other end wall **52** of the body **48** of the socket **42** has a second bore **72**. The second bore **72** of the other end wall **52** of the body **48** of the socket **42** has the set of lamp socket wires **60** of the socket **42** extending outwardly therethrough for electrically splicing to the conventional set of lamp socket wires **36** of the conventional fluorescent fixture **20** and have the splices protected by the conventional second wire nuts, shrink wrap, *etc.* **38**.

The socket **42** further comprises a plurality of electrical slots **74**. The plurality of electrical slots **74** of the socket **42** extend in the bottom wall **64** defining the chamber **62** of the socket **42**, and selected ones thereof electrically communicate with selected ones of the set of power supply wires **58** of the socket **42** and the set of lamp socket wires **60** of the socket **42**.

(2) ***The ballast 44.***

The ballast **44** comprises a body **76**. The body **76** of the ballast **44** is generally rectangular parallelepiped-shaped, and has a rear wall **78**, a pair of end walls **80**, a pair of side walls **82**, and a front wall **84**.

The body **76** of the ballast **44** is snugly and interchangeably received in the chamber **62** of the socket **42**, with the pair of side walls **82** of the body **76** of the ballast **44** abutting against the pair of side walls **66** defining the chamber **62** of the socket **42**, respectively, with the pair of end walls **80** of the body **76** of the ballast **44** abutting against the pair of end walls **68** defining the chamber **62** of the socket **42**, respectively, and with the rear wall **78** of the body **76** of the ballast **44** abutting against the bottom wall **64** defining the chamber **62** of the socket **42**.

The pair of side walls **82** of the body **76** of the ballast **44** extend higher than the pair of side walls **66** defining the chamber **62** of the socket **42**, respectively, and the pair of end walls **80** of the body **76** of the ballast **44** extend higher than the pair of end walls **68** defining the chamber **62** of the socket **42**, respectively, so as to provide an area to be gripped when the ballast **44** is interchangeably engaging the socket **42**.

The ballast **44** further comprises a plurality of electrical blades **86**. The plurality of electrical blades **86** of the ballast **44** extend from the rear wall **78** of the body **76** of the ballast **44**, and engage cooperatively in the plurality of electrical slots **74** of the socket **42**, respectively, so as to electrically communicate the ballast **44** with the set of power supply wires **58** of the socket **42** and the set of lamp socket wires **60** of the socket **42**, and thereby allow, once the socket **42** is one-time, and one-time only, wired into the conventional fluorescent fixture **20**, the ballast **44** to be repetitively replaced without ever having to wire the ballast **44** to the conventional fluorescent fixture **20**.

(3) *The first embodiment of the apparatus 46.*

The apparatus **46** includes the pair of side walls **66** defining the chamber **62** of the socket **42** having a pair of through slots **88** extending axially therethrough, respectively. The pair of through slots **88** of the pair of side walls **66** defining the chamber **62** of the socket **42** of the apparatus **46** are generally rectangular-shaped, and are disposed midway along the pair of side walls **66** defining the chamber **62** of the socket **42**, respectively.

The apparatus **46** further includes the pair of side walls **82** of the body **76** of the ballast **44** having a pair of recessed portions **90**, respectively. The pair of recessed portions **90** of the pair of side walls **82** of the body **76** of the ballast **44** of the apparatus **46** taper from the front wall **84** of the body **76** of the ballast **44** to short of the rear wall **78** of the of the body **76** of the ballast **44**, are disposed midway along the pair of side walls **82** of the body **76** of the ballast **44**, respectively, and are a same general length as, and are positioned in alignment with, the pair of through slots **88** of the pair of side walls **66** defining the chamber **62** of the socket **42** of the apparatus **46**, respectively.

The apparatus **46** further includes a pair of tabs **92**. The pair of tabs **92** of the apparatus **46** are livingly hinged in the pair of recessed portions **90** of the pair of side walls **82** of the body **76** of the ballast **44** of the apparatus **46**, respectively, in close proximity to the front wall **84** of the body **76** of the ballast **44**, so as to allow the pair of tabs **92** of the apparatus **46** to pivot in and out of the pair of recessed portions **90** of the pair of side walls **82** of the body **76** of the ballast **44** of the apparatus **46**, respectively.

The pair of tabs **92** of the apparatus **46** have a pair of outer surfaces **94** with free ends **95**, respectively. The pair of outer surfaces **94** of the pair of tabs **92** of the apparatus **46** have first protrusions **96** thereon, respectively. The first protrusions **96** of the pair of outer surfaces **94** of the pair of tabs **92** of the apparatus **46** extend axially along the pair of outer surfaces **94** of the pair of tabs **92** of the apparatus **46**, respectively,

, are vertically spaced-apart, and form gripping areas for facilitating squeezing the pair of tabs **92** of the apparatus **46** into the pair of recessed portions **90** of the pair of side walls **82** of the body **76** of the ballast **44** of the apparatus **46**, respectively.

The free ends **95** of the pair of outer surfaces **94** of the pair of tabs **92** of the apparatus **46** have thereon a pair of second protrusions **98**, respectively. The pair of second protrusions **98** of the pair of outer surfaces **94** of the pair of tabs **92** of the apparatus **46** extend axially along the pair of outer surfaces **94** of the pair of tabs **92** of the apparatus **46**, respectively, and selectively engage in the pair of through slots **88** of the pair of side walls **66** defining the chamber **62** of the socket **42** of the apparatus **46**, respectively, and when the gripping areas of the pair of tabs **92** of the apparatus **46** are squeezed, the ballast **44** is inserted into the socket **42**, released, and the pair of second protrusions **98** of the pair of outer surfaces **94** of the pair of tabs **92** of the apparatus **46** engage in the pair of through slots **88** of the pair of side walls **66** defining the chamber **62** of the socket **42** of the apparatus **46**, respectively, and thereby electrically, mechanically, and

interchangeably connecting the ballast **44** to the socket **42** without ever having to wire the ballast **44** to the conventional fluorescent fixture **20**.

E. Specific configuration of a second embodiment of the apparatus 146.

The specific configuration of a second embodiment of the apparatus **146** can best be seen in **FIGURES 5** and **6**, which are, respectively, an enlarged exploded diagrammatic perspective view of the area generally enclosed by the dotted curve identified by **ARROW 5** in **FIGURE 2** of a second embodiment of the apparatus of the combination of the embodiments of the present invention, and an enlarged diagrammatic cross sectional view taken along **LINE 6-6** in **FIGURE 5** but with the socket of the combination of the embodiments of the present invention and the ballast of the combination of the embodiments of the present invention assembled together, and as such, will be discussed with reference thereto.

The apparatus **146** includes the pair of side walls **166** defining the chamber **162** of the socket **142** having a pair of through slots **188** extending axially therethrough, respectively. The pair of through slots **188** of the pair of side walls **166** defining the chamber **162** of the socket **142** of the apparatus **146** are generally rectangular-shaped, and are disposed midway along the pair of side walls **166** defining the chamber **162** of the socket **142**, respectively.

The apparatus **146** further includes the pair of side walls **182** of the body **176** of the ballast **144** having a pair of recessed portions **190**, respectively. The pair of recessed portions **190** of the pair of side walls **182** of the body **176** of the ballast **144** of the apparatus **146** diverge from, and open into, the front wall **184** of the body **176** of the ballast **144**, to short of the rear wall **178** of the body **176** of the ballast **144**, are disposed midway along the pair of side walls **182** of the body **176** of the ballast **144**, respectively, and are a same general length as, and are positioned in alignment with, the pair of through slots **188** of the pair of side walls **166** defining the chamber **162** of the socket **142** of the apparatus **146**, respectively.

The apparatus **146** further includes a pair of tabs **192**. The pair of tabs **192** of the apparatus **146** are livingly hinged in the pair of recessed portions **190** of the pair of side walls **182** of the body **176** of the ballast **144** of the apparatus **146**, respectively, in close proximity to the rear wall **178** of the body **176** of the ballast **144**, so as to allow the pair of tabs **192** of the apparatus **146** to pivot in and out of the pair of recessed portions **190** of the pair of side walls **182** of the body **176** of the ballast **144** of the apparatus **146**, respectively.

The pair of tabs **192** of the apparatus **146** extend past the front wall **184** of the body **176** of the ballast **144** to free ends **193** so as to form a pair of handles **193a**, respectively.

The pair of handles **193a** of the pair of tabs **192** of the apparatus **146** have a pair of outer surfaces **194**, respectively. The pair of outer surfaces **194** of the pair of handles **193a** of the pair of tabs **192** of the apparatus **146** have first protrusions **196** thereon, respectively. The first protrusions **196** of the pair of outer surfaces **194** of the pair of handles **193a** of the pair of tabs **192** of the apparatus **146** extend axially along the pair of outer surfaces **194** of the pair of handles **193a** of the pair of tabs **192** of the apparatus **146**, respectively, are vertically spaced-

apart, and form gripping areas for facilitating squeezing the pair of handles **193a** of the pair of tabs **192** of the apparatus **146** into the pair of recessed portions **190** of the pair of side walls **182** of the body **176** of the ballast **144** of the apparatus **146**, respectively.

The pair of outer surfaces **194** of the pair of tabs **192** of the apparatus **146** have thereon a pair of second protrusions **198**, respectively. The pair of second protrusions **198** of the pair of outer surfaces **194** of the pair of tabs **192** of the apparatus **146** extend axially along the pair of outer surfaces **194** of the pair of tabs **192** of the apparatus, respectively, are disposed about midway on the pair of outer surfaces **194** of the pair of tabs **192** of the apparatus, respectively, and selectively engage in the pair of through slots **188** of the pair of side walls **166** defining the chamber **162** of the socket **142** of the apparatus **146**, respectively, and when the gripping areas of the pair of handles **193a** of the pair of tabs **192** of the apparatus **146** are squeezed, the ballast **144** is inserted into the socket **142**, released, and the pair of second protrusions **198** of the pair of outer surfaces **194** of the pair of tabs **192** of the apparatus **146** engage in the pair of through slots **188** of the pair of side walls **166** defining the chamber **162** of the socket **142** of the apparatus **146**, respectively, and thereby electrically, mechanically, and interchangeably connecting the ballast **144** to the socket **142** without ever having to wire the ballast **144** to the conventional fluorescent fixture **20**.

F. Specific configuration of a third embodiment of the apparatus 246.

The specific configuration of a third embodiment of the apparatus **246** can best be seen in **FIGURES 7** and **8**, which are, respectively, an enlarged exploded diagrammatic perspective view of the area generally enclosed by the dotted curve identified by **ARROW 7** in **FIGURE 2** of a third embodiment of the apparatus of the combination of the embodiments of the present invention, and an enlarged diagrammatic cross sectional view taken along **LINE 8-8** in **FIGURE 7** but with the socket of the combination of the embodiments of the present invention and the ballast of the combination of the embodiments of the present invention assembled together, and as such, will be discussed with reference thereto.

The apparatus **246** includes the bottom wall **264** defining the chamber **262** of the socket **242** having a threaded bore **288** extending therethrough. The threaded bore **288** of the bottom wall **264** defining the chamber **262** of the socket **242** of the apparatus **246** is disposed midway along the bottom wall **264** defining the chamber **262** of the socket **242** of the apparatus **246**.

The apparatus **246** further includes the body **276** of the ballast **244** having a through bore **290**. The through bore **290** of the body **276** of the ballast **244** of the apparatus **246** extends from the front wall **284** of the body **276** of the ballast **244** to the rear wall **278** of the body **276** of the ballast **244**, is disposed midway along the body **276** of the ballast **244** of the apparatus **246**, and is positioned in alignment with the threaded bore **288** of the bottom wall **264** defining the chamber **262** of the socket **242** of the apparatus **246**.

The apparatus **246** further includes a wing bolt **292**. The wing bolt **292** of the apparatus **246** extends freely through the through bore **290** of the body **276** of the ballast **244** of the

apparatus **246**, selectively threadably into the threaded bore **288** of the bottom wall **264** defining the chamber **262** of the socket **242** of the apparatus **246**, and has a wing head **294** that forms a gripping area for facilitating threading the wing bolt **292** of the apparatus **246** into the threaded bore **288** of the bottom wall **264** defining the chamber **262** of the socket **242** of the apparatus **246**, and when the ballast **244** is inserted into the socket **242** and the wing bolt **292** of the apparatus **246** is tightened into the threaded bore **288** of the bottom wall **264** defining the chamber **262** of the socket **242** of the apparatus **246**, the ballast **244** is thereby electrically, mechanically, and interchangeably connected to the socket **242** without ever having to wire the ballast **244** to the conventional fluorescent fixture **20**.

G. Specific configuration of a fourth embodiment of the apparatus 346.

The specific configuration of a fourth second embodiment of the apparatus **346** can best be seen in **FIGURES 9** and **10**, which are, respectively, an enlarged exploded diagrammatic perspective view of the area generally enclosed by the dotted curve identified by **ARROW 9** in **FIGURE 2** of a fourth embodiment of the apparatus of the combination of the embodiments of the present invention, and an enlarged diagrammatic cross sectional view taken along **LINE 10-10** in **FIGURE 9** but with the socket of the combination of the embodiments of the present invention and the ballast of the combination of the embodiments of the present invention assembled together, and as such, will be discussed with reference thereto.

The apparatus **346** includes the pair of side walls **366** defining the chamber **362** of the socket **342** having a threaded bore **388** and a hook **389**, respectively. The threaded bore **388** of one side wall **366** defining the chamber **362** of the socket **342** of the apparatus **346** extends midway on the one side wall **366** defining the chamber **362** of the socket **342** and inwardly from a direction of the front wall **356** of the body **348** of the socket **342**. The hook **389** of the other side wall **366** defining the chamber **362** of the socket **342** of the apparatus **346** extends midway on the other side wall **366** defining the chamber **362** of the socket **342** and outwardly from a direction of the front wall **356** of the body **348** of the socket **342**.

The apparatus **346** further includes a bar **390**. The bar **390** of the apparatus **346** has a pair of free ends **391**. The pair of free ends **391** of the bar **390** of the apparatus **346** have a pair of through bores **392**, respectively.

The apparatus **346** further includes a wing bolt **393**. The wing bolt **393** of the apparatus **346** has a wing head **394**, and selectively engages in the threaded bore **388** of the one side wall **366** defining the chamber **362** of the socket **342** of the apparatus **346**.

One through bore **392** of one free end **391** of the bar **390** of the apparatus **346** is pivotally engaged by the hook **389** of the other side wall **366** defining the chamber **362** of the socket **342** of the apparatus **346**. The other through bore **392** of the other free end **391** of the bar **390** of the apparatus **346** receives the wing bolt **393** of the apparatus **346**, and when the ballast **344** is inserted into the chamber **362** of the socket **342** and the bar **390** of the apparatus **346** is pivoted onto the front wall **384** of the body **376** of the ballast **344**, the wing bolt **393** of the

apparatus **346** is threaded into the threaded bore **388** of the one side wall **366** defining the chamber **362** of the socket **342** of the apparatus **346** and tightened, and thereby electrically, mechanically, and interchangeably connecting the ballast **344** to the socket **342** without ever having to wire the ballast **344** to the conventional fluorescent fixture **20**.

H. Specific configuration of a fifth embodiment of the apparatus 446.

The specific configuration of a fifth embodiment of the apparatus **446** can best be seen in **FIGURES 11** and **12**, which are, respectively, an enlarged exploded diagrammatic perspective view of the area generally enclosed by the dotted curve identified by **ARROW 11** in **FIGURE 2** of a fifth embodiment of the apparatus of the combination of the embodiments of the present invention, and an enlarged diagrammatic cross sectional view taken along **LINE 12-12** in **FIGURE 11** but with the socket of the combination of the embodiments of the present invention and the ballast of the combination of the embodiments of the present invention assembled together, and as such, will be discussed with reference thereto.

The apparatus **446** includes the bottom wall **464** defining the chamber **462** of the socket **442** of the apparatus **446** having a first pair of magnets **488** that are generally flush in the bottom wall **464** defining the chamber **462** of the socket **442**. The first pair of magnets **488** of the bottom wall **464** defining the chamber **462** of the socket **442** of the apparatus **446** are disposed adjacent to the pair of end walls **468** defining the chamber **462** of the socket **442**, respectively.

The apparatus **446** further includes the rear wall **478** of the body **476** of the ballast **444** having a second pair of magnets **490** that is generally flush in the rear wall **478** of the body **476** of the ballast. The second pair of magnets **490** of the rear wall **478** of the body **476** of the ballast **444** of the apparatus **446** are disposed adjacent to the pair of end walls **480** of the body **476** of the ballast **444**, respectively, and when the ballast **444** is inserted into the chamber **462** of the socket **442**, the second pair of magnets **490** of the rear wall **478** of the body **476** of the ballast **444** of the apparatus **446** are attracted to the first pair of magnets **488** of the bottom wall **464** defining the chamber **462** of the socket **442** of the apparatus **446**, and thereby electrically, mechanically, and interchangeably connecting the ballast **444** to the socket **442** without ever having to wire the ballast **444** to the conventional fluorescent fixture **20**.

I. Impressions.

It will be understood that each of the elements described above or two or more together may also find a useful application in other types of constructions differing from the types described above.

While the embodiments of the present invention have been illustrated and described as embodied in a combination for replacing a ballast of a conventional fluorescent fixture without ever having to wire the ballast to the conventional fluorescent fixture, however, they are not limited to the details shown, since it will be understood that various omissions, modifications, substitutions, and changes in the forms and details of the embodiments of the present invention

illustrated and their operation can be made by those skilled in the art without departing in any way from the spirit of the embodiments of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the embodiments of the present invention that others can by applying current knowledge readily adapt them for various applications without omitting features that from the standpoint of prior art fairly constitute characteristics of the generic or specific aspects of the embodiments of the present invention.

7. Claims.

The invention claimed is:

1. A combination for replacing a ballast of a conventional fluorescent fixture without ever having to wire the ballast to the conventional fluorescent fixture, wherein the conventional fluorescent fixture has a conventional hood, a conventional set of power supply wires, and a conventional set of lamp socket wires, said combination comprising:
   a) a socket;
   b) a ballast; and
   c) means for electrically, mechanically, and interchangeably connecting said ballast to said socket without ever having to wire said ballast to the conventional fluorescent fixture;
   wherein said socket is for mounting to the conventional hood of the conventional fluorescent fixture;
   wherein said socket is for electrically splicing to the conventional set of power supply wires of the conventional fluorescent fixture;
   wherein said socket is for electrically splicing to the conventional set of lamp socket wires of the conventional fluorescent fixture; and
   wherein said ballast is electrically, mechanically, and interchangeably connected to said socket so as to allow said ballast to be replaced without ever having to wire said ballast to the conventional fluorescent fixture.

2. The combination of claim 1, wherein said socket comprises a body;
   wherein said body of said socket is generally rectangular parallelepiped-shaped;
   wherein said body of said socket has:
   a) a rear wall;
   b) a pair of end walls;
   c) a pair of side walls; and
   d) a front wall;
   wherein said rear wall of said body of said socket is for mounting to the conventional hood of the conventional fluorescent fixture.

3. The combination of claim 2, wherein said socket comprises a set of power wires.

4. The combination of claim 3, wherein said set of power supply wires of said socket extend outwardly from one end wall of said body of said socket; and
   wherein said set of power supply wires of said socket are for electrically splicing to the conventional set of power supply wires of the conventional fluorescent fixture.

5. The combination of claim 4, wherein said socket comprises a set of lamp socket wires.

6. The combination of claim 5, wherein said set of lamp socket wires of said socket extend outwardly from the other end wall of said body of said socket; and
wherein said set of lamp socket wires of said socket are for electrically splicing to the conventional set of lamp socket wires of the conventional fluorescent fixture.

7. The combination of claim 5, wherein said socket comprises a chamber.

8. The combination of claim 7, wherein said chamber of said socket extends inwardly from said front wall of said body of said socket to short of said rear wall of said body of said socket.

9. The combination of claim 7, wherein said chamber of said socket opens into said front wall of said body of said socket.

10. The combination of claim 7, wherein said chamber of said socket is generally rectangular parallelepiped-shaped, similarly to that of said body of said socket but smaller; and
wherein said chamber of said socket is defined by:
a) a bottom wall;
b) a pair of side walls; and
c) a pair of end walls.

11. The combination of claim 5, wherein said one end wall of said body of said socket has a first bore.

12. The combination of claim 11, wherein said first bore of said one end wall of said body of said socket has said set of power supply wires of said socket extending outwardly therethrough for electrically splicing to the conventional set of power supply wires of the conventional fluorescent fixture.

13. The combination of claim 11, wherein said other end wall of said body of said socket has a second bore.

14. The combination of claim 13, wherein said second bore of said other end wall of said body of said socket has said set of lamp socket wires of said socket extending outwardly therethrough for electrically splicing to the conventional set of lamp socket wires of the conventional fluorescent fixture.

15. The combination of claim 10, wherein said socket comprises a plurality of electrical slots.

16. The combination of claim 15, wherein said plurality of electrical slots of said socket extend in said bottom wall defining said chamber of said socket;
wherein selected ones of said plurality of electrical slots of said socket electrically communicate with selected ones of said set of power supply wires of said socket; and
wherein selected ones of said plurality of electrical slots of said socket electrically communicate with selected ones of said set of lamp socket wires of said socket.

17. The combination of claim 15, wherein said ballast comprises a body;
wherein said body of said ballast is generally rectangular parallelepiped-shaped; and
wherein said body of said ballast has:
a) a rear wall;
b) a pair of end walls;
c) a pair of side walls; and
d) a front wall.

18. The combination of claim 17, wherein said body of said ballast is snugly received in said chamber of said socket;
wherein said body of said ballast is interchangeably received in said chamber of said socket;
wherein said pair of side walls of said body of said ballast abut against said pair of side walls defining said chamber of said socket, respectively;
wherein said pair of end walls of said body of said ballast abut against said pair of end walls defining said chamber of said socket, respectively; and
wherein said rear wall of said body of said ballast abuts against said bottom wall defining said chamber of said socket.

19. The combination of claim 17, wherein said pair of side walls of said body of said ballast extend higher than said pair of side walls defining said chamber of said socket and said pair of end walls of said body of said ballast extend higher than said pair of end walls defining said chamber of said socket so as to provide an area to be gripped when said ballast is interchangeably engaging said socket.

20. The combination of claim 17, wherein said ballast comprises a plurality of electrical blades.

21. The combination of claim 20, wherein said plurality of electrical blades of said ballast extend from said rear wall of said body of said ballast; and
wherein said plurality of electrical blades of said ballast engage cooperatively in said plurality of electrical slots of said socket, respectively, so as to electrically communicate said ballast with said set of power supply wires of said socket and said set of lamp socket wires of said socket, and thereby allow, once said socket is one-time, and one-time only, wired into the conventional fluorescent fixture, said ballast to be repetitively replaced without ever having to wire said ballast to the conventional fluorescent fixture.

22. The combination of claim 17, wherein said means includes said pair of side walls defining said chamber of said socket having a pair of through slots extending axially therethrough, respectively.

23. The combination of claim 22, wherein said pair of through slots of said pair of side walls defining said chamber of said socket of said means are generally rectangular-shaped; and
wherein said pair of through slots of said pair of side walls defining said chamber of said socket of said means are disposed midway along said pair of side walls defining said chamber of said socket, respectively.

24. The combination of claim 22, wherein said means includes said pair of side walls of said body of said ballast having a pair of recessed portions, respectively.

25. The combination of claim 24, wherein said pair of recessed portions of said pair of side walls of said body of said ballast of said means taper from said front wall of said body of said ballast to short of said rear wall of said of said body of said ballast.

26. The combination of claim 24, wherein said pair of recessed portions of said pair of side walls of said body of said ballast of said means are disposed midway along said pair of side walls of said body of said ballast, respectively.

27. The combination of claim 24, wherein said pair of recessed portions of said pair of side walls of said body of said ballast of said means are a same general length as said pair of through slots of said pair of side walls defining said chamber of said socket of said means, respectively; and.
wherein said pair of recessed portions of said pair of side walls of said body of said ballast of said means are positioned in alignment with said pair of through slots of said pair of side walls defining said chamber of said socket of said means, respectively.

28. The combination of claim 24, wherein said means includes a pair of tabs.

29. The combination of claim 28, wherein said pair of tabs of said means are livingly hinged in said pair of recessed portions of said pair of side walls of said body of said ballast of said means, respectively, in close proximity to said front wall of said body of said ballast so as to allow said pair of tabs of said means to pivot in and out of said pair of recessed portions of said pair of side walls of said body of said ballast of said means, respectively.

30. The combination of claim 28, wherein said pair of tabs of said means have a pair of outer surfaces, respectively;
wherein said pair of outer surfaces of said pair of tabs of said means have free ends, respectively; and
wherein said pair of outer surfaces of said pair of tabs of said means have first protrusions thereon.

31. The combination of claim 30, wherein said first protrusions of said pair of outer surfaces of said pair of tabs of said means extend axially along said pair of outer surfaces of said pair of tabs of said means, respectively;
wherein said first protrusions of said pair of outer surfaces of said pair of tabs of said means are vertically spaced-apart; and
wherein said first protrusions of said pair of outer surfaces of said pair of tabs of said means form gripping areas for facilitating squeezing said pair of tabs of said means into said pair of recessed portions of said pair of side walls of said body of said ballast of said means, respectively.

32. The combination of claim 31, wherein said free ends of said pair of outer surfaces of said pair of tabs of said means have thereon a pair of second protrusions, respectively.

33. The combination of claim 32, wherein said pair of second protrusions of said pair of outer surfaces of said pair of tabs of said means extend axially along said pair of outer surfaces of said pair of tabs of said means, respectively; and
wherein said pair of second protrusions of said pair of outer surfaces of said pair of tabs of said means selectively engage in said pair of through slots of said pair of side walls defining said chamber of said socket of said means, respectively, and when said gripping areas of said pair of tabs of said means are squeezed, said ballast is inserted into said socket and said pair of second protrusions of said pair of outer surfaces of said pair of tabs of said means engage in said pair of through slots of said pair of side walls defining said chamber of said socket of said means, respectively, and thereby electrically, mechanically, and interchangeably connecting said ballast to said socket without ever having to wire said ballast to the conventional fluorescent fixture.

34. The combination of claim 17, wherein said means includes said pair of side walls defining said chamber of said socket having a pair of through slots extending axially therethrough, respectively.

35. The combination of claim 34, wherein said pair of through slots of said pair of side walls defining said chamber of said socket of said means are generally rectangular-shaped; and wherein said pair of through slots of said pair of side walls defining said chamber of said socket of said means are disposed midway along said pair of side walls defining said chamber of said socket, respectively .

36. The combination of claim 34, wherein said means includes said pair of side walls of said body of said ballast having a pair of recessed portions, respectively.

37. The combination of claim 36, wherein said pair of recessed portions of said pair of side walls of said body of said ballast of said means diverge from said front wall of said body of said ballast to short of said rear wall of said of said body of said ballast;
wherein said pair of recessed portions of said pair of side walls of said body of said ballast of said means open into said front wall of said body of said ballast;
wherein said pair of recessed portions of said pair of side walls of said body of said ballast of said means are disposed midway along said pair of side walls of said body of said ballast, respectively;
wherein said pair of recessed portions of said pair of side walls of said body of said ballast of said means are a same general length as said pair of through slots of said pair of side walls defining said chamber of said socket of said means, respectively; and
wherein said pair of recessed portions of said pair of side walls of said body of said ballast of said means are positioned in alignment with said pair of through slots of said pair of side walls defining said chamber of said socket of said means, respectively.

38. The combination of claim 36, wherein said means includes a pair of tabs.

39. The combination of claim 38, wherein said pair of tabs of said means are livingly hinged in said pair of recessed portions of said pair of side walls of said body of said ballast of said means, respectively, in close proximity to said rear wall of said body of said ballast so as to allow said pair of tabs of said means to pivot in and out of said pair of recessed portions of said pair of side walls of said body of said ballast of said means, respectively.

40. The combination of claim 38, wherein said pair of tabs of said means extend past said front wall of said body of said ballast to free ends so as to form a pair of handles, respectively.

41. The combination of claim 40, wherein said pair of handles of said pair of tabs of said means have a pair of outer surfaces, respectively; and
wherein said pair of outer surfaces of said pair of handles of said pair of tabs of said means have first protrusions thereon, respectively.

42. The combination of claim 41, wherein said first protrusions of said pair of outer surfaces of said pair of handles of said pair of tabs of said means extend axially along said pair of outer surfaces of said pair of handles of said pair of tabs of said means, respectively;
wherein said first protrusions of said pair of outer surfaces of said pair of handles of said pair of tabs of said means are vertically spaced-apart; and
wherein said first protrusions of said pair of outer surfaces of said pair of handles of said pair of tabs of said means form gripping areas for facilitating squeezing said pair of handles of said pair of tabs of said means into said pair of recessed portions of said pair of side walls of said body of said ballast of said means, respectively.

43. The combination of claim 41, wherein said pair of outer surfaces of said pair of tabs of said means have thereon a pair of second protrusions, respectively.

44. The combination of claim 41, wherein said pair of second protrusions of said pair of outer surfaces of said pair of tabs of said means extend axially along said pair of outer surfaces of said pair of tabs of said means, respectively;
wherein said pair of second protrusions of said pair of outer surfaces of said pair of tabs of said means are disposed about midway on said pair of outer surfaces of said pair of tabs of said means, respectively; and
wherein said pair of second protrusions of said pair of outer surfaces of said pair of tabs of said means selectively engage in said pair of through slots of said pair of side walls defining said chamber of said socket of said means, respectively, and when said gripping areas of said pair of handles of said pair of tabs of said means are squeezed, said ballast is inserted into said socket, released, and said pair of second protrusions of said pair of outer surfaces of said pair of tabs of said means engage in said pair of through slots of said pair of side walls defining said chamber of said socket of said means, respectively, and thereby electrically, mechanically, and interchangeably connecting said ballast to said socket without ever having to wire said ballast to the conventional fluorescent fixture.

45. The combination of claim 17, wherein said means includes said bottom wall defining said chamber of said socket having a threaded bore extending therethrough.

46. The combination of claim 45, wherein said threaded bore of said bottom wall defining said chamber of said socket of said means is disposed midway along said bottom wall defining said chamber of said socket.

47. The combination of claim 45, wherein said means includes said body of said ballast having a through bore.

48. The combination of claim 47, wherein said through bore of said body of said ballast of said means extends from said front wall of said body of said ballast to said rear wall of said body of said ballast.

49. The combination of claim 47, wherein said through bore of said body of said ballast of said means is disposed midway along said body of said ballast.

50. The combination of claim 47, wherein said through bore of said body of said ballast of said means is positioned in alignment with said threaded bore of said bottom wall defining said chamber of said socket of said means.

51. The combination of claim 47, wherein said means includes a wing bolt.

52. The combination of claim 51, wherein said wing bolt of said means extends freely through said through bore of said body of said ballast of said means and selectively threadably into said threaded bore of said bottom wall defining said chamber of said socket of said means;
wherein said wing bolt of said means has a wing nut head; and
wherein said wing nut head of said wing bolt of said means forms a gripping area for facilitating threading said wing bolt of said means into said threaded bore of said bottom wall defining said chamber of said socket of said means, and when said ballast is inserted into said socket and said wing bolt of said means is tightened into said threaded bore of said bottom wall defining said chamber of said socket of said means, said ballast is thereby electrically, mechanically, and interchangeably connected to said socket without having to wire said ballast to the conventional fluorescent fixture.

53. The combination of claim 17, wherein said means includes said pair of side walls defining said chamber of said socket, respectively, having:
a) a threaded bore; and
b) a hook.

54. The combination of claim 53, wherein said threaded bore of one side wall defining said chamber of said socket extends midway on said one side wall defining said chamber of said socket; and
wherein said threaded bore of said one side wall defining said chamber of said socket extends inwardly from a direction of said front wall of said body of said socket.

55. The combination of claim 54, wherein said hook of the other side wall defining said chamber of said socket extends midway on said other side wall defining said chamber of said socket; and
wherein said hook of said other side wall defining said chamber of said socket extends outwardly from a direction of said front wall of said body of said socket.

56. The combination of claim 55, wherein said means includes a bar.

57. The combination of claim 56, wherein said bar of said means has a pair of free ends; and wherein said pair of free ends of said bar of said means have a pair of through bores, respectively.

58. The combination of claim 56, wherein said means includes a wing bolt.

59. The combination of claim 58, wherein said wing bolt of said means has a wing head; and wherein said wing bolt of said means selectively engages in said threaded bore of said one side wall defining said chamber of said socket.

60. The combination of claim 58, wherein one through bore of one free end of said bar of said means is pivotally engaged by said hook of said other side wall defining said chamber of said socket of said means; and
wherein the other through bore of the other free end of said bar of said means receives said wing bolt of said means, and when said ballast is inserted into said chamber of said socket and said bar of said means is pivoted onto said front wall of said body of said ballast, said wing bolt of said means is threaded into said threaded bore of said one side wall defining said chamber of said socket and tightened, and thereby electrically, mechanically, and interchangeably connecting said ballast to said socket without ever having to wire said ballast to the conventional fluorescent fixture.

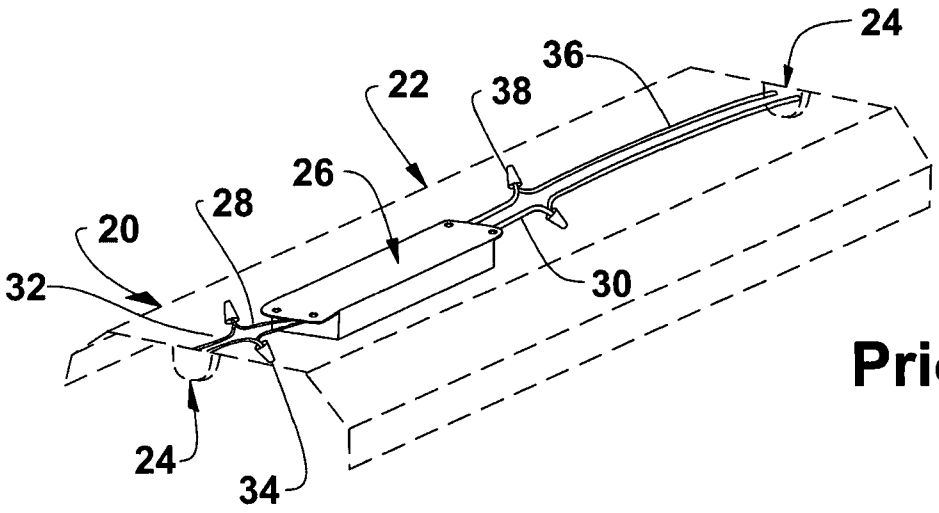
61. The combination of claim 17, wherein said means includes said bottom wall defining said chamber of said socket having a first pair of magnets that are generally flush in said bottom wall defining said chamber of said socket.

62. The combination of claim 61, wherein said first pair of magnets of said bottom wall defining said chamber of said socket of said means are disposed adjacent to said pair of end walls defining said chamber of said socket, respectively.

63. The combination of claim 61, wherein said means includes said rear wall of said body of said ballast having a second pair of magnets in said rear wall of said body of said ballast.

64. The combination of claim 63, wherein said second pair of magnets of said rear wall of said body of said ballast of said means are disposed adjacent to said pair of end walls of said body of said ballast, respectively, and when said ballast is inserted into said chamber of said socket, said second pair of magnets of said rear wall of said body of said ballast of said means are attracted to said first pair of magnets of said bottom wall defining said chamber of said socket of said means, and thereby electrically, mechanically, and interchangeably connecting said ballast to said socket without ever having to wire said ballast to the conventional fluorescent fixture.

Figure 1



Prior Art

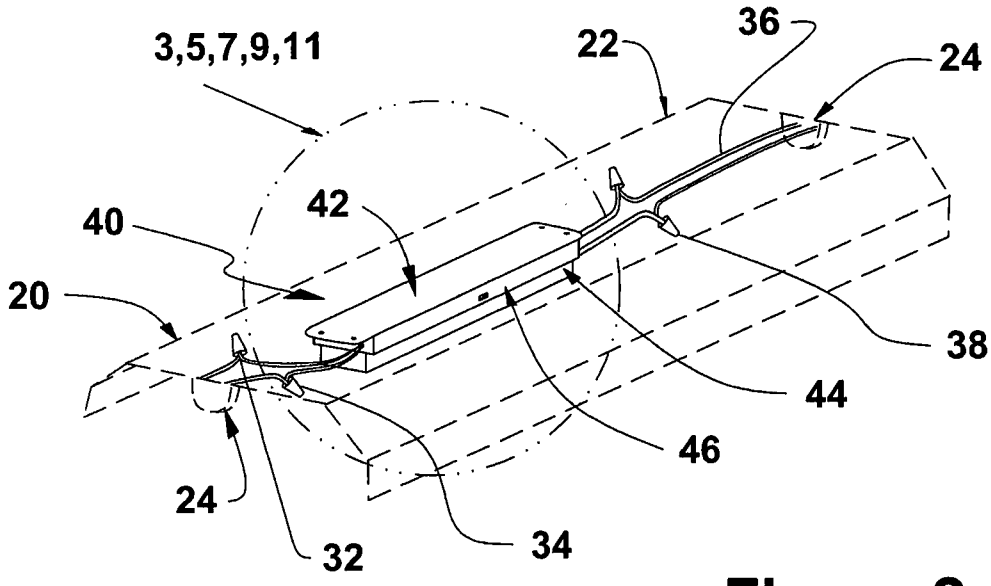


Figure 2

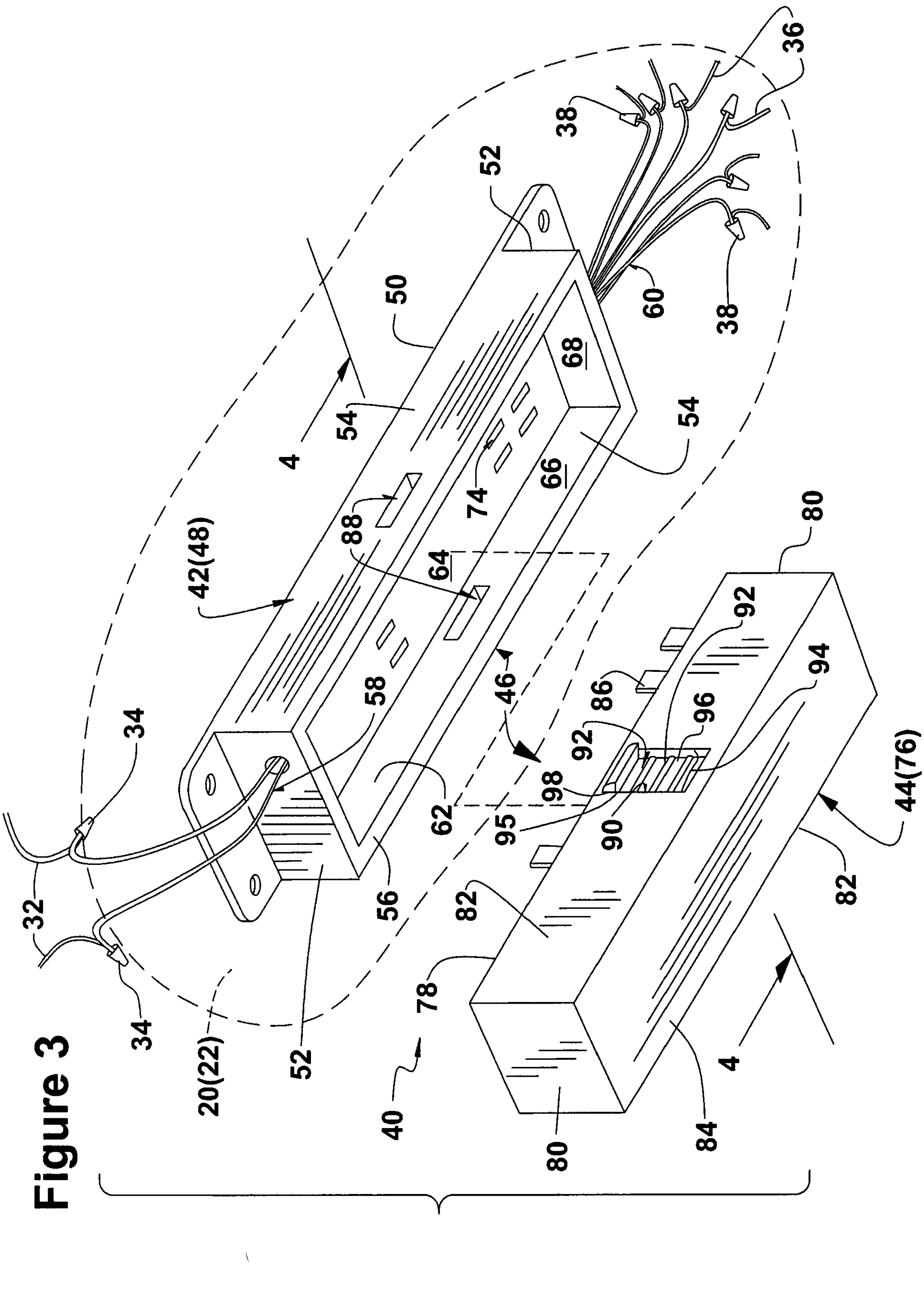

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Figure 3

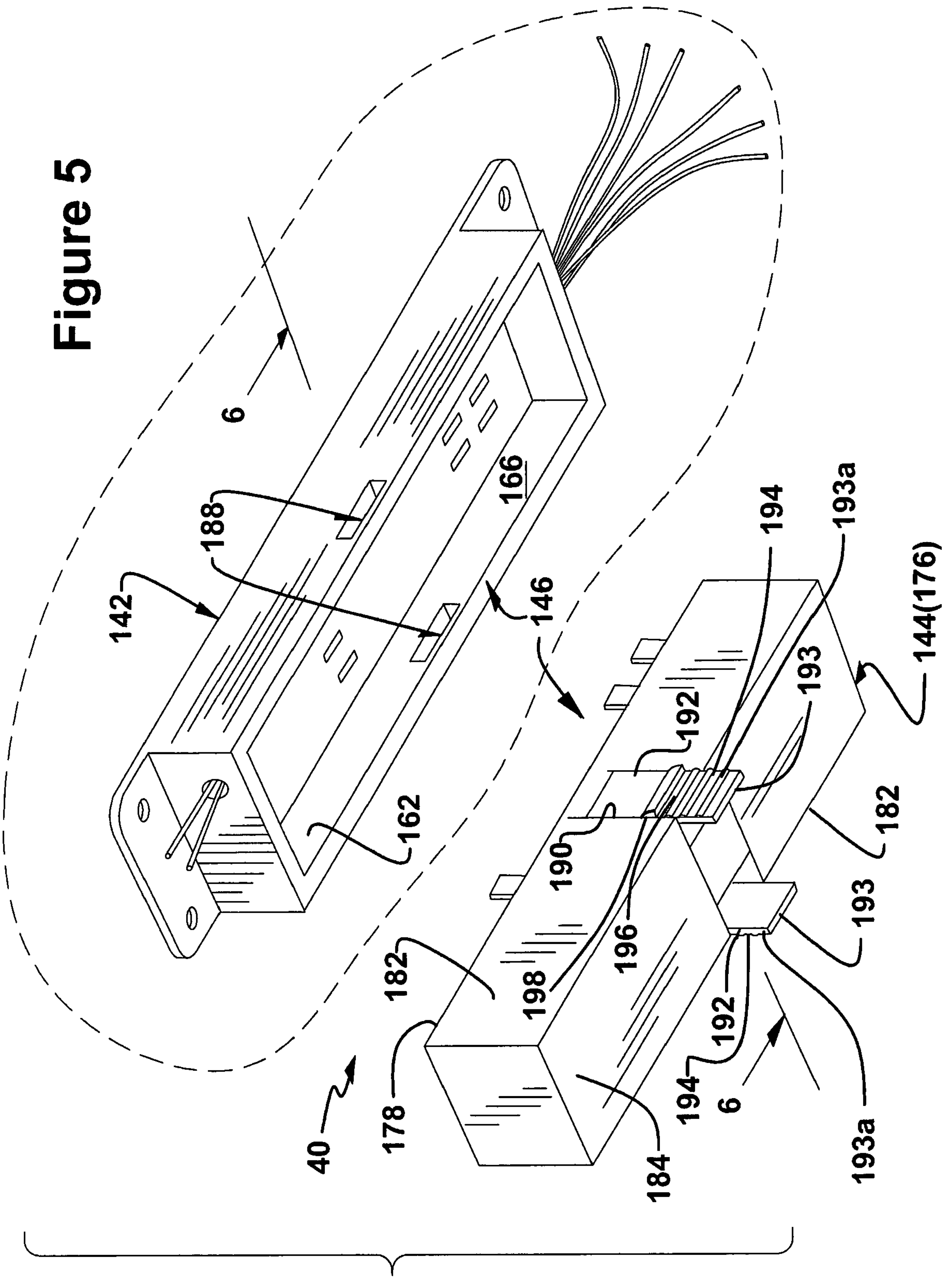
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Figure 5

Figure 4

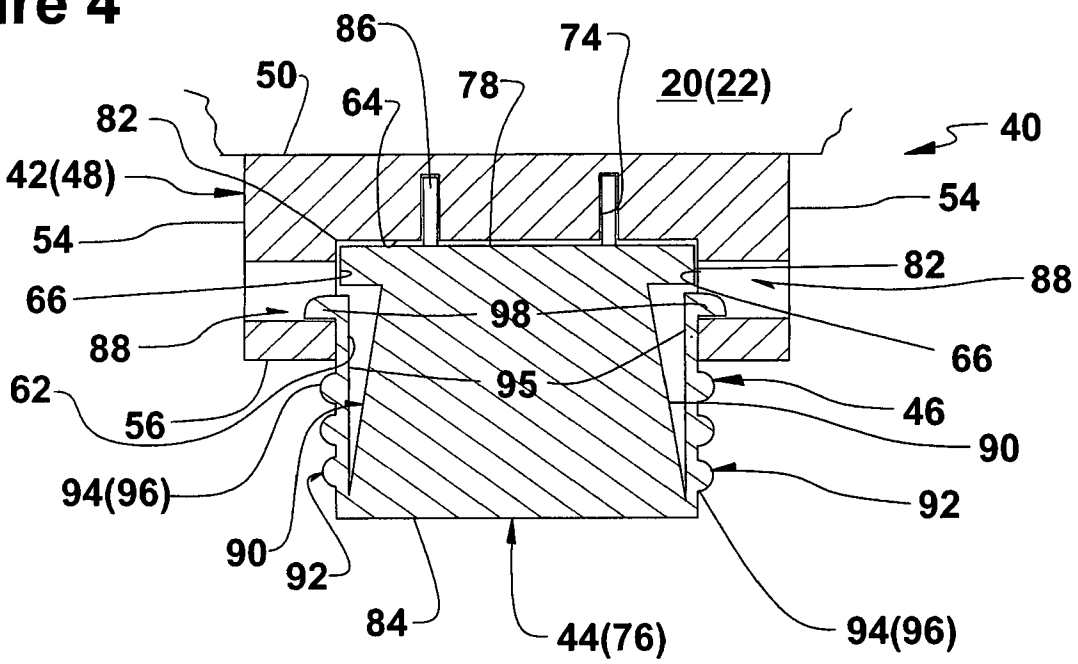
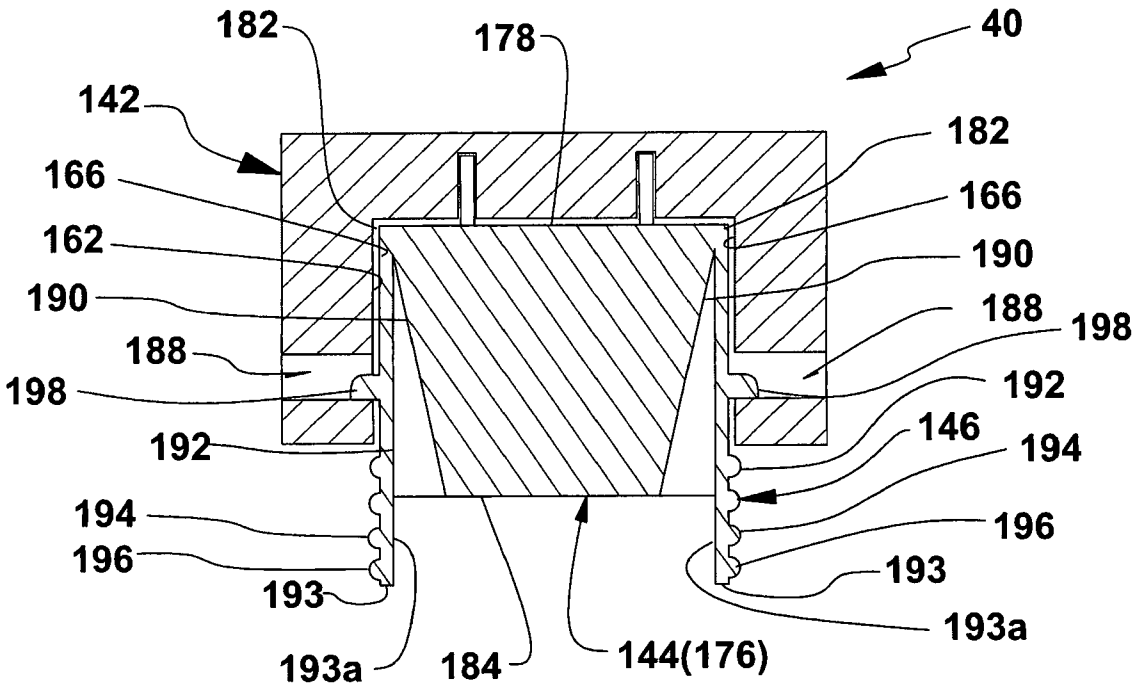


Figure 6



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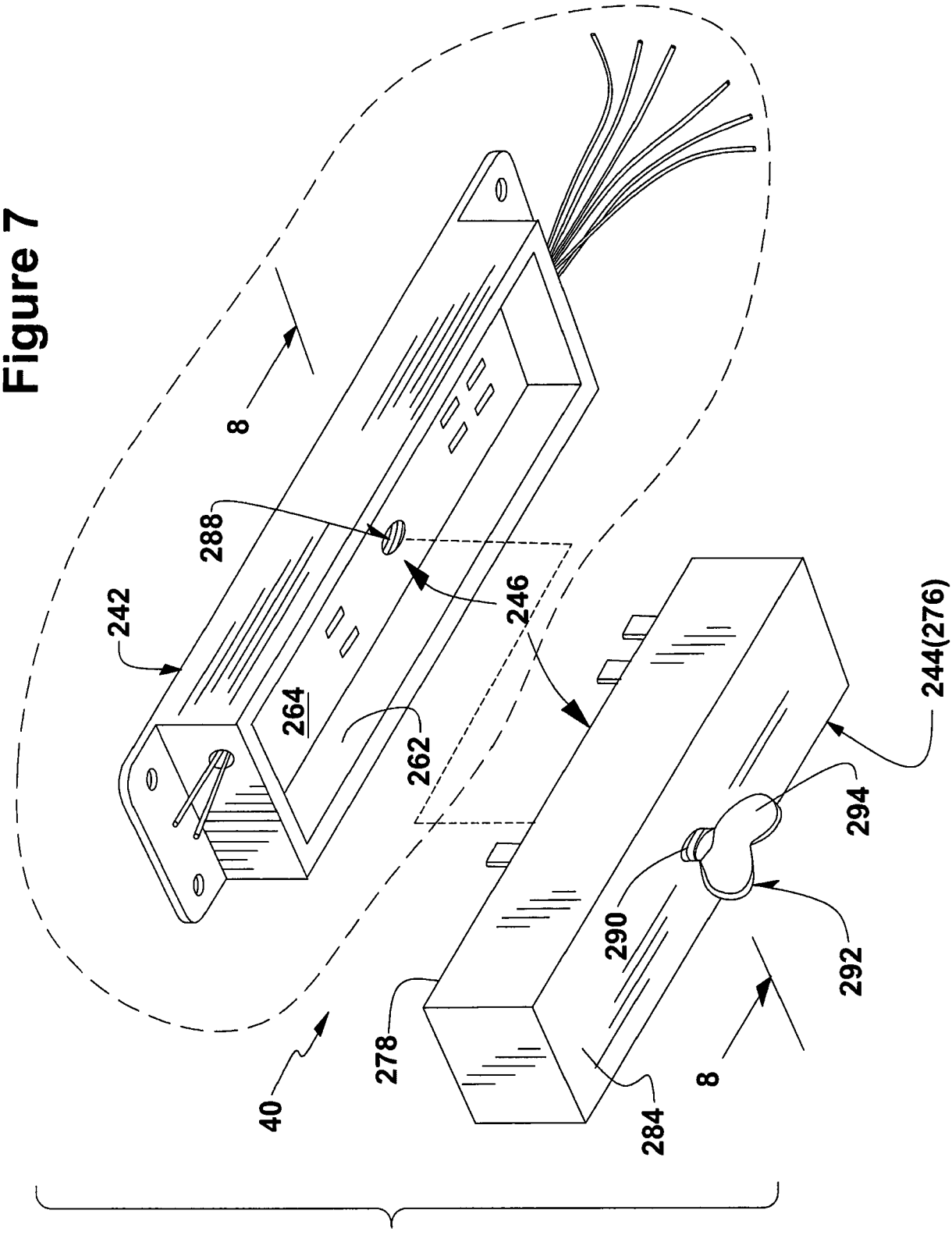


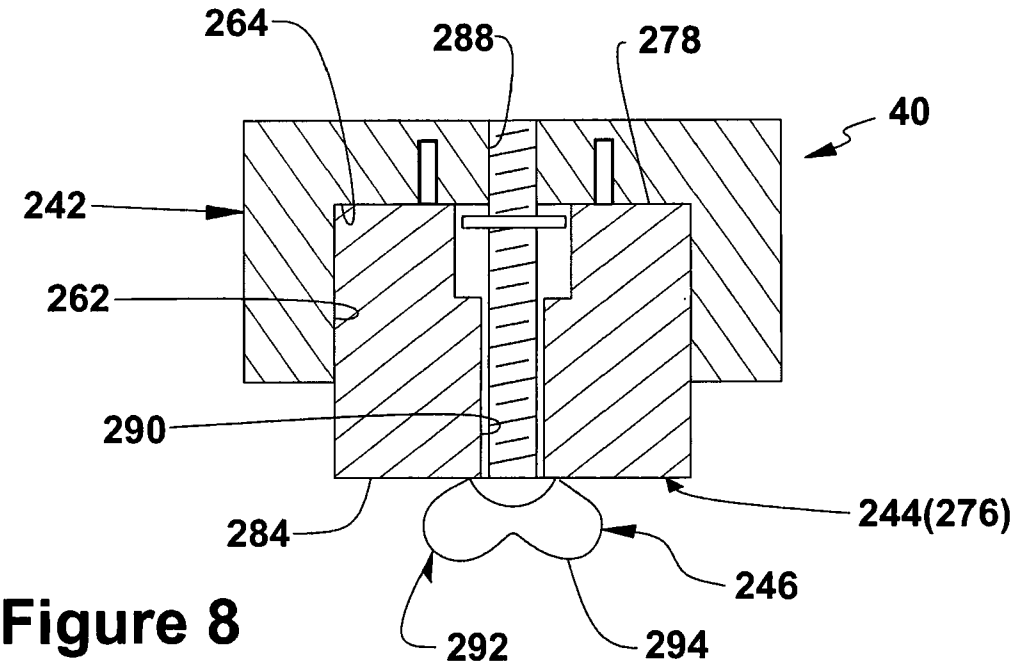


Figure 8

Figure 10

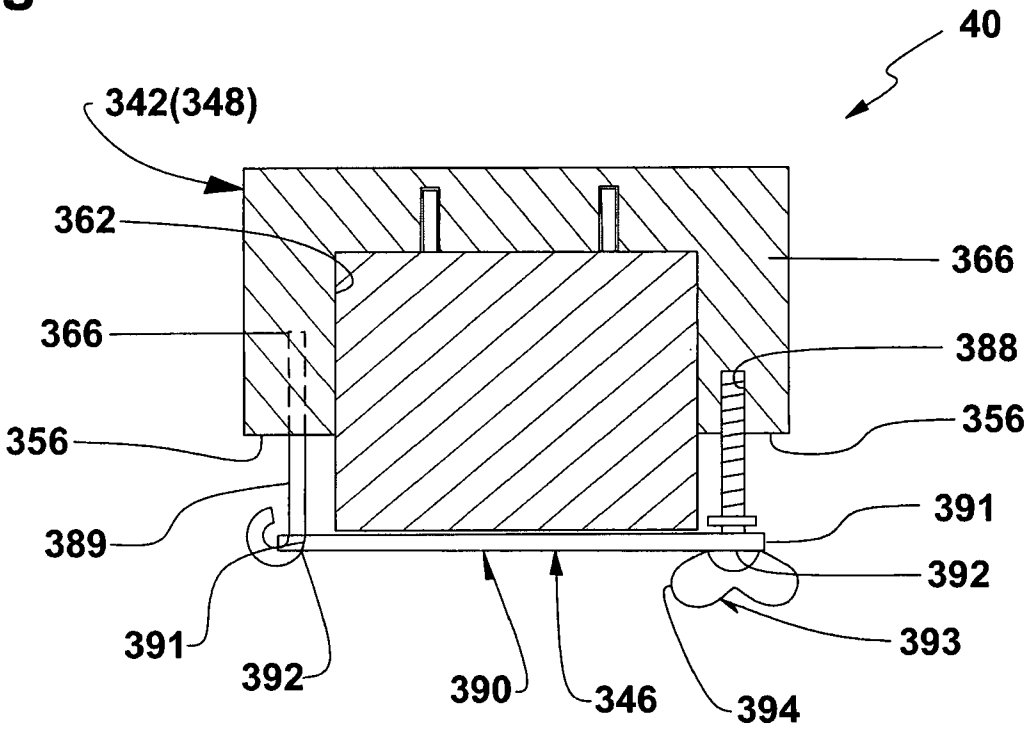


Figure 9

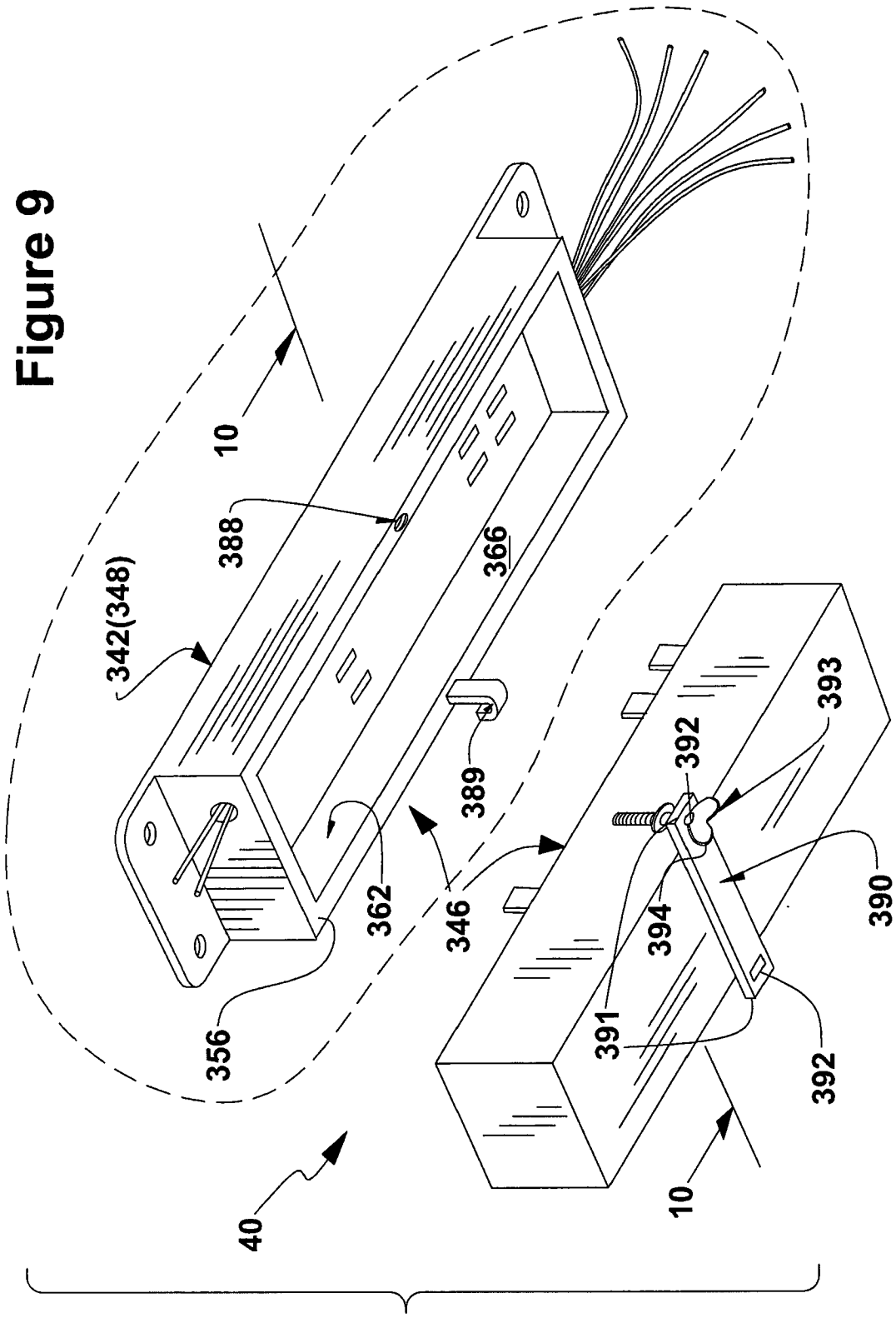


Figure 11

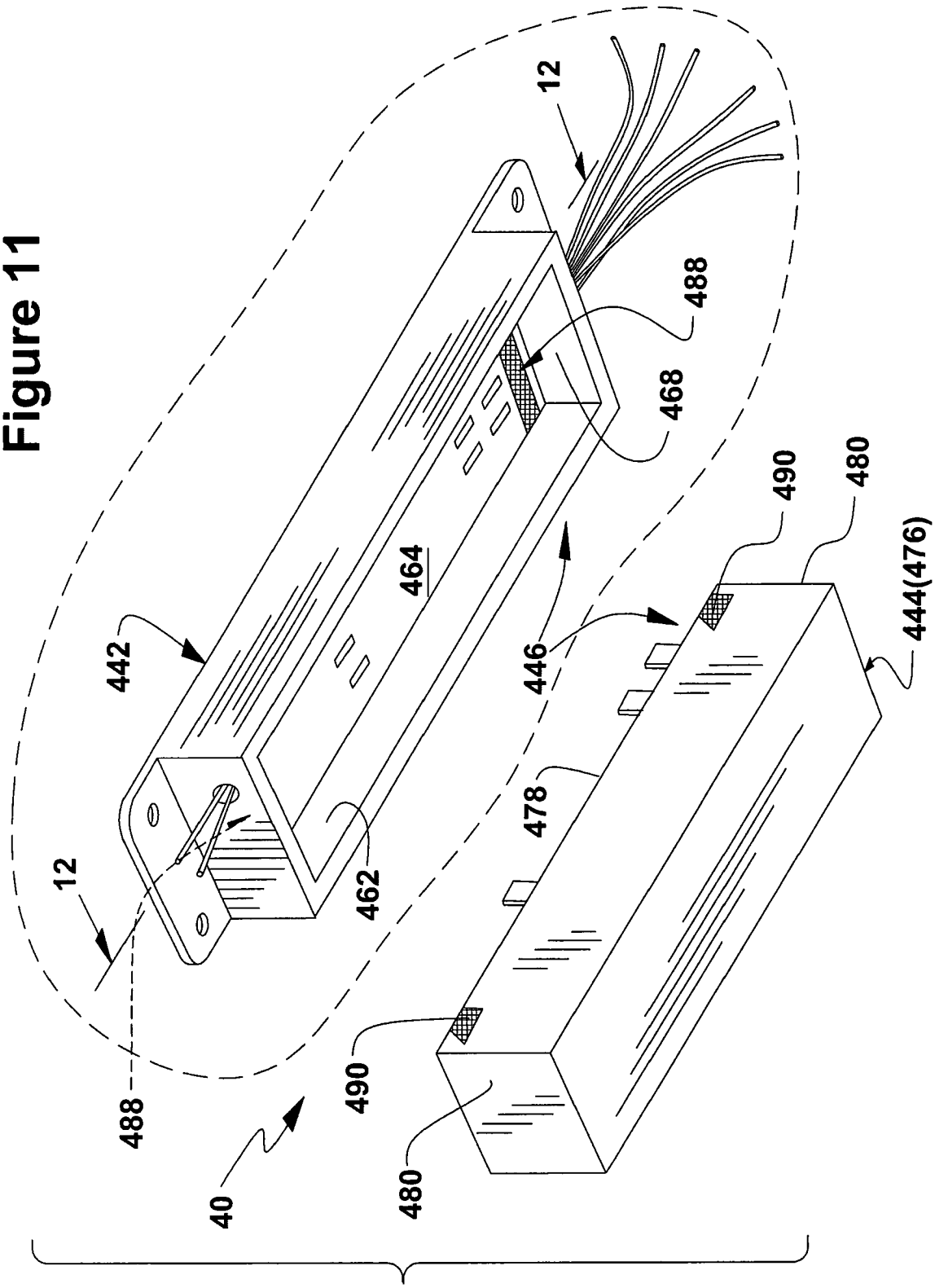
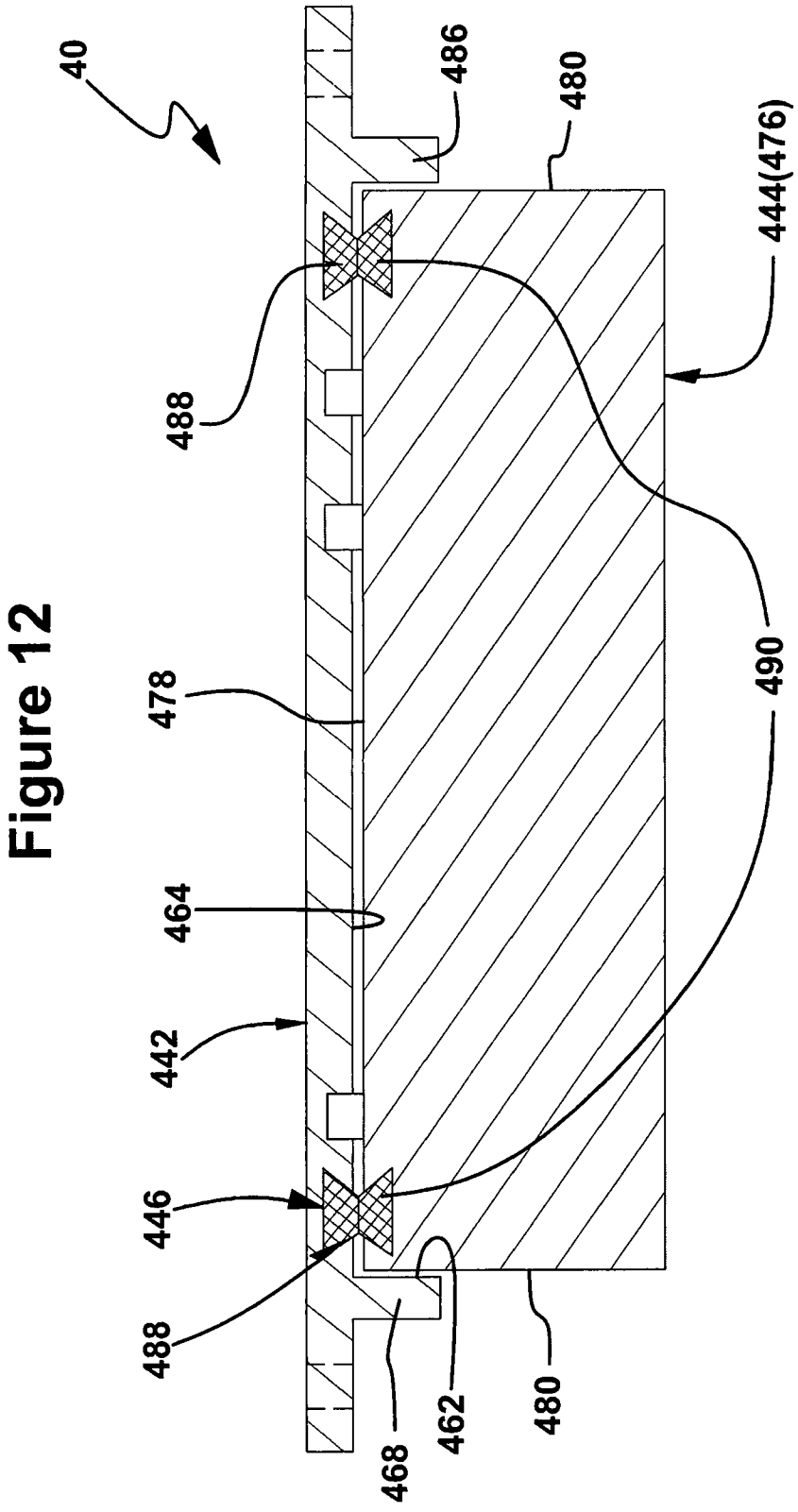


Figure 12



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/023112

A. CLASSIFICATION OF SUBJECT MATTER

F21V 19/00(2006.01)i, F21V 17/10(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

F21V 19/00; F21V 17/00; F21S 4/00; F21V 23/00; H01R 33/02; F21V 23/02

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: ballast, socket, replacing

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	KR 10-2008-0091652 A (KUN WOO LIGHTING CO., LTD.) 14 October 2008 See the abstract; paragraphs [0022],[0023],[0035]; figures 2-4.	1-64
A	KR 10-2008-0078519 A (KIM, MYOUNG SHIN) 27 August 2008 See the abstract; paragraphs [0012],[0013],[0023]; figures 1-3.	1-64
A	US 7950822 B2 (DENG JIA H) 31 May 2011 See the abstract; figures 3,4.	1-64
A	US 7090390 B2 (PAZULA; BRUCE RAYMOND) 15 August 2006 See the abstract; claim 1.	1-64

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents,such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
24 AUGUST 2012 (24.08.2012)	**28 AUGUST 2012 (28.08.2012)**
Name and mailing address of the ISA/KR Korean Intellectual Property Office 189 Cheongsa-ro, Seo-gu, Daejeon Metropolitan City, 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer WEE Jae Woo Telephone No. 82-42-481-8540

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

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