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Taylor

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[54] **MODULAR WIRE GUARD**

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[52] **U.S. Cl.** ..... **116/114 R;** 40/128; 52/147; 350/105

[51] **Int. Cl.²** **E04H 12/20;** G01D 21/04

[58] **Field of Search** ..... 116/2, 114 R; 256/3, 4; 40/128; 52/147; 174/92, 136; 350/105

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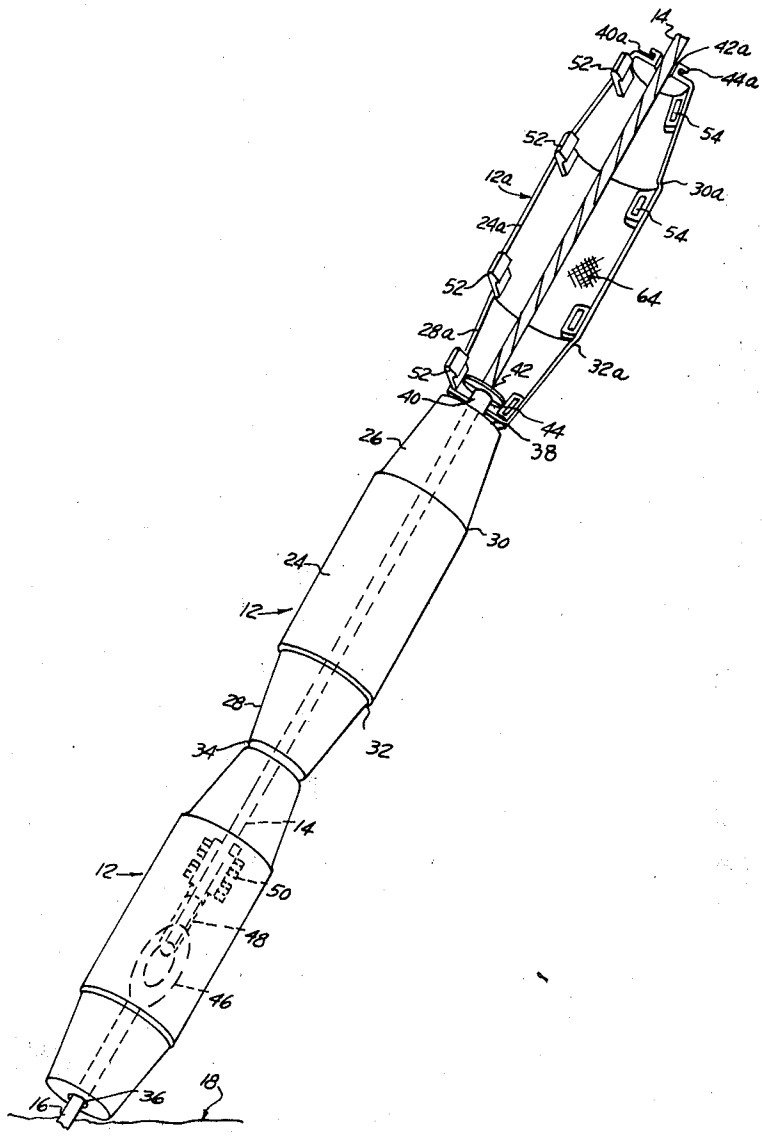
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[57] **ABSTRACT**

A modular assembly for protectively enclosing guy wires of the type used to brace utility poles or the like. The guard assembly comprises a plurality of substantially identical interlocking modular units. Each modular unit is formed of a pair of interlocking half shell sections that are snapped together about the guy wire.

13 Claims, 5 Drawing Figures



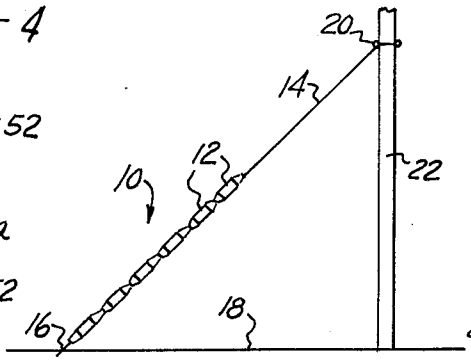


FIG. 1

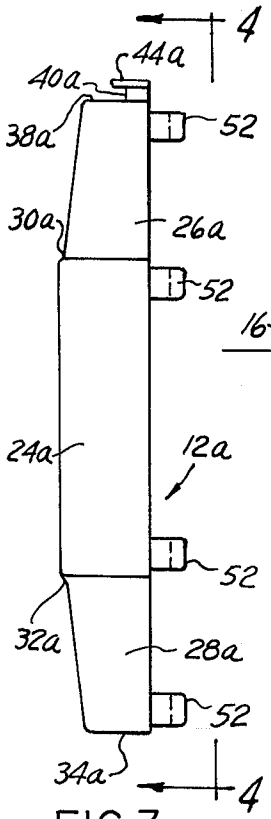


FIG. 3

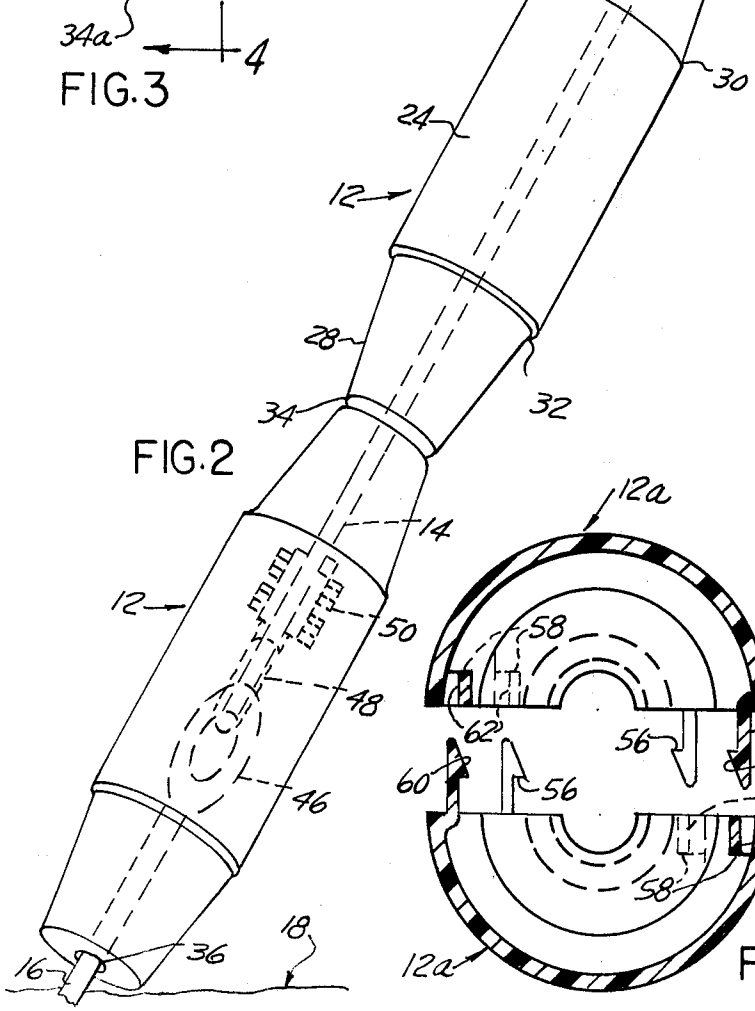


FIG. 2

FIG. 5

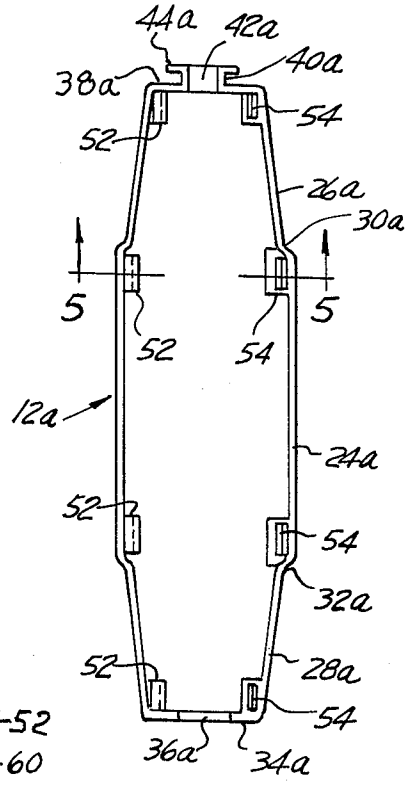


FIG. 4

MODULAR WIRE GUARD

BACKGROUND OF THE INVENTION

I. Field of the Invention

This invention relates generally to protective coverings for elongated members and more particularly to guards that are used for increasing the visibility, by increasing the surface area, of guy wires such as are used to brace utility poles or the like.

II. Description of the Prior Art

When utility poles are installed it is sometimes necessary to brace them with guy wires having one end anchored to the ground and the other end attached to the pole proximate its top. The lower end of the guy wire often poses a serious collision hazard to persons, animals and vehicles which may inadvertently contact the guy wire. The hazard is attributable to the fact that guy wires are generally of small diameter and highly tensioned. As such, they constitute a structure which is almost rigid, not highly visible, and capable of exerting high forces per unit area against any colliding object.

Many prior art device have been developed for increasing the surface area and visibility of guy wires. Those devices include grooved wooden blocks strung along the guy wire, stamped half round elongated metal shields clamped to the guy wire, and one-piece tubular plastic extrusions that are slit to allow engagement about the guy wire. There are many problems associated with those prior art devices. Wooden blocks rot, are attacked by insects, require painting, are flammable, and are easily broken off. Elongated stamped metal guards only enclose a portion of the cable and in addition to being heavy and expensive to manufacture, they are costly and cumbersome to store, transport and install. An extruded plastic guy wire guard must have sufficient torsional rigidity to prevent it from becoming twisted about the guy wire. To achieve an acceptable level of rigidity it is necessary to use a heavier wall than would otherwise be required. This additional material, when combined with usually required secondary manufacturing operations, results in a guy wire guard of substantial cost.

Most of the guy wire guards known in the prior art require hand tools to install. Although some guards are easier to install than others, it is a real disadvantage in cold or otherwise inclement weather that any tool at all be required to install a guy wire guard.

SUMMARY OF THE INVENTION

The present invention overcomes the problems and limitations associated with the prior art devices mentioned above. It does so by providing a guy wire guard formed of a plurality of tubular modular units which are manually assembled without tools around a guy wire in such a way that the individual modular units are interconnected end to end for forming a protective guy wire guard assembly of any desired length.

Each modular unit is made of a pair of substantially identical half shell sections. Each of the sections is provided with integral means for interconnecting one section to another section to form a tubular modular unit. Each modular unit is provided with integral means disposed at each end for interconnection with adjacent modular units.

The visibility of the guy wire assembly is further enhanced, if so desired, by forming the assembly of individual modular units of differing colors or by providing

the modular units with incident light reflective means. Each individual tubular modular unit is loosely disposed around the guy wire on which it is mounted so as to tend to rotatably deflect an object colliding with the guy wire.

The invention provides a guy wire guard assembly made of individual modular units which are cheap to manufacture by automated molding processes. Enough space is provided in the interior of each tubular modular unit to accept the eye of the bolt used to anchor the lower end of a guy wire.

In addition, the guy wire guard modular units of the invention, being preferably molded of a plastic dielectric material, provide good electrical insulation which may be advantageous in some installations, and they are unaffected by inclement weather, moisture, mildew, and atmospheric pollutants.

BRIEF DESCRIPTION OF THE DRAWINGS

Reference is now made to the drawings in which like or equivalent elements appearing in more than one FIGURE are referred to by the same reference characters, and in which:

FIG. **1** is a side view of a modular guy wire guard assembly installed on the lower portion of an inclined guy wire bracing a utility pole or the like;

FIG. **2** is a side perspective view of the lower portion of an anchored guy wire provided with a guard assembly according to the invention;

FIG. **3** is a side elevation view of a guy wire modular unit section according to the invention;

FIG. **4** is a bottom view of the section of FIG. **3** as seen from line **4—4** of FIG. **3**; and

FIG. **5** is an enlarged composite of two juxtaposed section cross-sections as viewed along line **5—5** of FIG. **4** which best illustrates the way two sections are used to form a modular unit.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to FIG. **1**, a modular guy wire guard assembly **10** formed from a plurality of substantially identical individual modular units **12** disposed interlocked end to end, is shown protectively enclosing the lower portion of an inclined guy wire **14.** The lower end of the guy wire **14** is attached to an anchor eye bolt **16** which is firmly secured in the ground **18.** The upper end of the guy wire **14** is connected to a clamp **20** which is attached to a utility pole **22** or the like. The lower end of the utility pole **22** is firmly embedded in the ground **18.** The guy wire **14** is used to brace the utility pole **22** against unequal loads which may be applied to the upper portion of the utility pole **22.**

The general appearance of a guy wire guard assembly is best illustrated at FIG. **2.** Each tubular modular unit **12** has a central cylindrical portion **24** and a pair of conical end portions **26** and **28.** These conical end portions **26** and **28** are integrally formed at both ends of the central cylindrical portion **24,** with circumferentially disposed transitional ridges or steps **30** and **32,** respectively, being formed between the ends of the central portion **24** and the end portions **26** and **28.** The ends of each modular unit have separate male and female configurations to allow a positive but non-rigid inner connection between adjacent modular units.

The female end of a modular unit **12** has an end surface **34** which is provided with a centrally located circular aperture **36** through which the guy wire **14**

passes. The male end of a modular unit **12** has an end surface **38** which is provided with an integral cylindrical neck **40** disposed along the longitudinal axis of the modular unit. The cylindrical neck **40** is provided with an axially aligned bore **42** configured to allow passage of the guy wire **14** therethrough. An outwardly extending flange **44** is integral with the cylindrical neck **40** and is disposed about the periphery of the bore **42.** The interrelationship between these male and female modular end structures will be further described hereinafter.

The modular units are substantially hollow and, as shown in FIG. **2,** are capable of containing the head **46** of the anchor eye bolt **16,** a guy wire strain relief bracket **48** about which a length of the guy wire **14** is looped, and a guy wire clamp **50.**

Each individual guy wire guard module **12** is formed from a pair of mated, interlocking sections. It is to be understood that this invention may be successfully practiced using a pair of mating sections which are not identical. However, the sections illustrated in the accompanying FIGS. **2–5** are of the type wherein two substantially identical sections are used for forming a modular unit.

When reference is made to structural features of modular forming sections which correspond to structural features of a complete modular unit which have been hereinbefore referenced and described, then these features are identified by the same reference numeral followed by the suffix "*a*."

FIG. **3** is a side view of a modular forming section **12***a* which clearly shows four integral barbed prongs **52.** In FIG. **4,** which is a bottom view of the section as seen from lines **4—4** of FIG. **3,** four integral barbed prong receptacles **54** can be seen. These integral barbed prong receptacles **54** are disposed to receive barbed prongs **52** when two sections **12***a* are matingly positioned as is shown in FIG. **5** to form a modular unit **12.** As can best be seen in FIG. **5** each barbed prong receptacle **54** is provided with a lip **58** which is engageable with a surface **56** on barbed prong **52** when a pair of sections **12***a* are assembled to form a modular unit **12.**

Each barbed prong **52** has an inclined surface **60** which contacts an inner surface **62** on a corresponding barbed prong receptacle **54** as a mated pair of sections are pressed together during assembly. The inner surface **62** presses against the inclined surface **60** deflecting both the barbed prong **52** and the surface **62.** This deflection continues until the surface **56** overshoots the lip **58** at which point the deflected prong **52** and the surface **62** snap back to their original position. The engagement between corresponding lips **58** and surfaces **56** in a mated pair of module forming sections **12***a* functions to securely and rigidly interlock one section **12***a* to the other section **12***a* forming a guard modular unit **12** which is not intended to be disassembled.

A modular guy wire guard assembly **10** is formed by positioning the female end surface of a section **34***a* adjacent the male end surface **38** of a modular unit **12** as is shown in FIG. **2.** The neck **40** on modular unit **12** is receivable by the semicircular aperture **36***a* in the female end surface **34***a* of the modular forming section **12***a*. The outside diameter of the outwardly projecting flange **44** is greater than the inside diameter of the semicircular aperture **36***a* in the female end surface **34***a*. When a second modular unit forming section **12***a* is interlockingly assembled with the section as shown and positioned in FIG. **2,** the flange **44** of the first mentioned modular unit is positively retained within the interior of the newly formed modular unit forming a modular guy wire guard assembly **10.** This procedure of assembling new modular units so as to interconnect them with adjacent modular units may be performed with as many units as is required to form a modular guy wire guard assembly of any desired length.

The individual modular units **12** which comprise a guy wire guard assembly **10** are free to rotate with respect to one another about the guy wire **14** on which they are installed. The relative rotatability of the modular units **12** comprising assembly **10** is accomplished by providing appropriate clearances between the outside diameter of the guy wire **14** and the inside diameter of the bore **42** and between the inside diameter of aperture **36** and the outside diameter of the neck **40.** These clearances not only allow a glancing blow to the protected guy wire to be rotatably deflected but also allow the assembly to move flex with the guy wire as the guy wire flexes.

Preferably the sections **12a** used to form the individual modular units **12** are manufactured by an injection molding process from plastic resins such as polyvinyl chloride, polycarbonate, and the like. It is to be understood that these sections can also be made from light metals. The sections **12***a* may be made from a transparent material and their inner surfaces **64** configured to reflect incident light in much the same manner as the inner surfaces of automotive tail lights are configured. The exterior surface of the central cylindrical portion **24** on a modular unit **12** may be treated with a coating of reflective glass beads to enhance the night visibility of the modular unit. The modular units **12** may be either painted or molded in different colors and various colors alternated to form an assembly **10,** whereby the visibility of the assembly is further increased. If it is desired to electrically insulate the guy wire **14** from any inadvertently contacting objects, then the sections **12***a* are formed from dielectric material.

From the foregoing detailed description it will be evident that there are a number of changes, adaptations, and modifications of the present invention which come within the province of those skilled in the art; however, it is intended that all such variations not departing from the spirit of the invention be considered as within the scope thereof as limited solely by the appended claims.

I claim:

1. A modular guard assembly for protecting and enhancing the visibility of a length of wire, said assembly comprising a plurality of individual modular units disposed end to end about said length of wire, each of said units comprising:

a pair of mating half shell sections adapted to snap together and peripherally loosely enclose said wire;

means integral with said half shell sections for permanently interlockingly connecting said half shell sections in mated relationship, said means comprising:

a barbed prong on one half shell section, and

a corresponding lip on said mating half shell section for engaging said barbed prong; and

means at each end of said modular unit for nonrigidly interconnecting adjacent modular units for forming said assembly.

2. The modular guard assembly of claim **1** wherein said modular unit comprises means for reflecting incident light.

3. The modular guard assembly of claim **1** wherein a portion of the exterior surface of said modular unit is provided with glass beads for reflecting incident light.

4. The modular guard assembly of claim 1 wherein each pair of mating half shell sections comprises two substantially identical half shell sections.

5. The modular guard assembly of claim 1 wherein said non-rigid interconnecting means comprises:

an outwardly radially extending flange disposed at an end of said modular unit;

an inwardly radially extending lip disposed at the other end of said modular unit, said lip extending over said outwardly extending flange on an adjacent modular unit.

6. The modular guard assembly of claim 1 wherein said mating half shell sections are made of molded plastic.

7. A modular wire guard unit for protectively enclosing a length of wire comprising:

a pair of mating half shell sections adapted to snap together and peripherally loosely enclose said length of wire;

means integral with said half shell sections for permanently interlockingly connecting said pair of half shell sections in mated relationship, said integral interlocking means comprising:

a barbed prong on one half shell section, and

a corresponding lip on said mating half shell section for engagement by said barbed prong; and

means integral with said modular guard unit for providing a non-rigid longitudinal interconnection of a plurality of substantially identical modular guard units in an end-to-end relationship.

8. The modular guard unit of claim 7 further comprising means for reflecting incident light.

9. The modular guard unit of claim 7 wherein a portion of the exterior surface of said modular guard unit is treated with glass beads for reflecting incident light.

10. The modular guard unit of claim 7 wherein said mating half shell sections are substantially identical.

11. The modular wire guard unit of claim 7 wherein said mating half shell sections are made of molded plastic.

12. The modular guard unit of claim 7 wherein said non-rigid interconnecting means comprises:

an outwardly radially extending flange disposed at an end of said modular unit; and

an inwardly radially extending lip disposed at the other end of said modular unit, said lip engageable over the outwardly extending flange of an adjacent modular unit whereby said flange is non-rigidly interlockingly retained by said lip.

13. The modular guard unit of claim 12 wherein said modular unit comprises a cylindrical body portion and a pair of integral conical end portions each having its end of larger diameter disposed at an end of said cylindrical body portion.

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