United States Patent [19]

Trevithick

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[54] **LAMP GUARD**

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[73] Assignee: **Daniel Woodhead, Inc.,** Northbrook, Ill.

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[52] **U.S. Cl.** ..... **240/102 R**

[51] **Int. Cl.²** **F21V 15/02**

[58] **Field of Search** ..... 240/54 R, 102 R, 100

[56] **References Cited**

UNITED STATES PATENTS

1,695,468	12/1928	Reeves	240/102 R
3,191,021	6/1965	Berry et al.	240/100 X
3,336,474	8/1967	Leibl	240/100
3,609,348	9/1971	Marasco	240/102 R
3,838,269	9/1974	Bogdanous	240/102 R

Primary Examiner—Joseph F. Peters, Jr.

Attorney, Agent, or Firm—Johnson, Dienner, Emrich & Wagner

[57] **ABSTRACT**

A lamp guard for protecting the lamp bulbs of hand lamps, trouble lamps, stringlights and the like is disclosed, wherein two flexible annular enclosure members, having tapered sides and molded from a transparent or translucent material, such as a synthetic polymer, are locked together by interengaging threads on the two members, and prevented from pulling apart by an annular retainer. An annular groove on one member receives an annular rib on the other, thereby forming a "tongue and groove" type of connection, wherein threads on one face of the rib engage similar threads on the adjacent wall of the groove, and the depths of the threads are greater than the clearance between the rib and the internal walls of the groove, whereby when a compressive force is applied to a side of the guard in the area of the connection between the two enclosure members, which would tend to pull the members apart at a point substantially 90° from the point where the force is applied and crush the guard, the threads of the tongue and groove construction together with the annular retainer will hold them together and prevent crushing.

7 Claims, 4 Drawing Figures

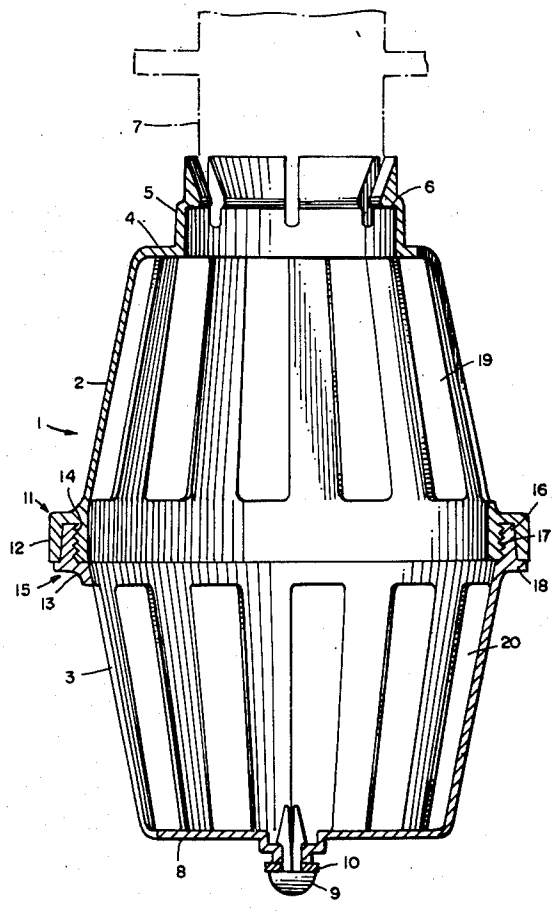


FIG. 1

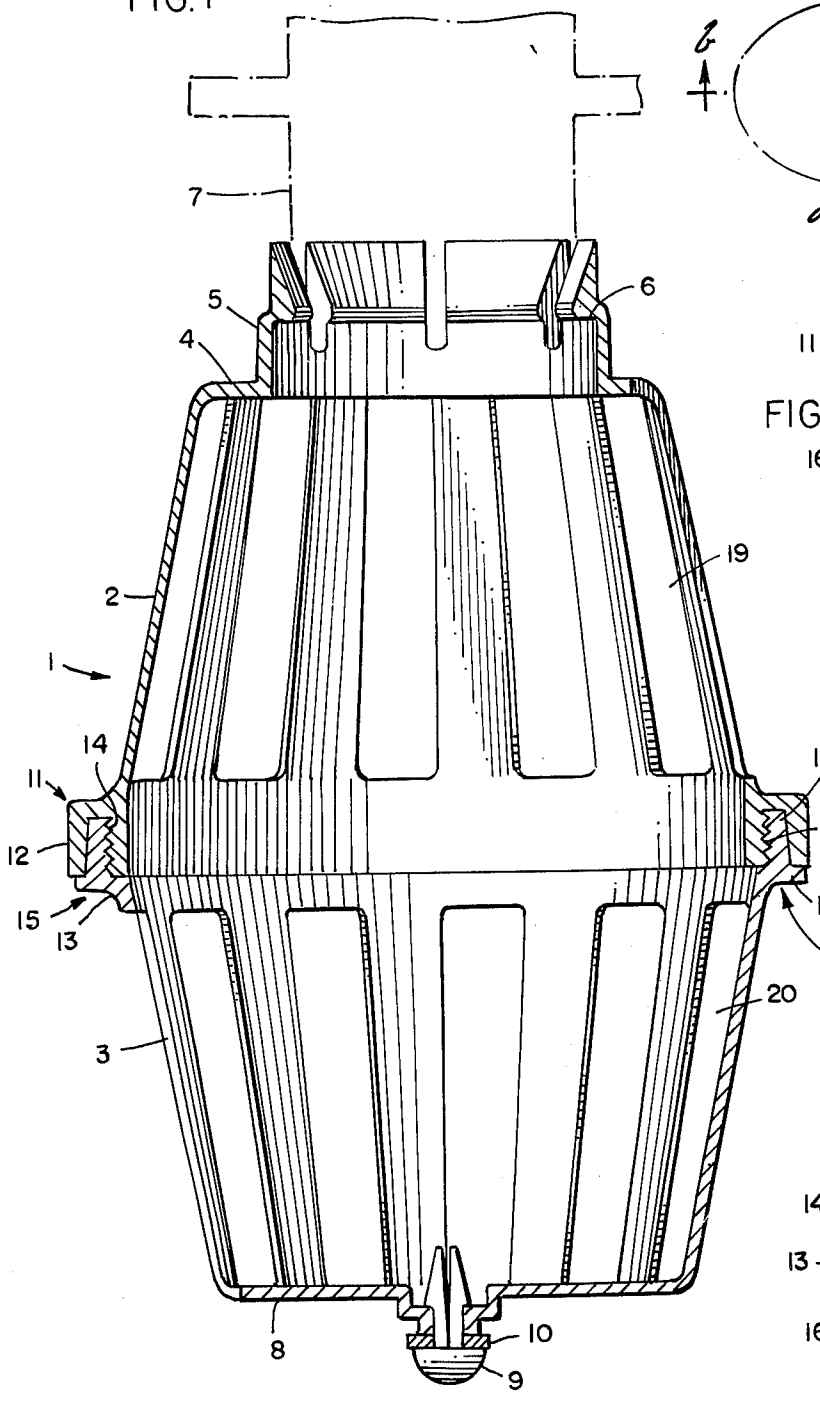


FIG. 3

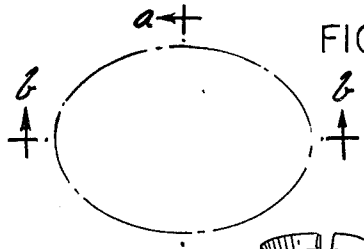


FIG. 2

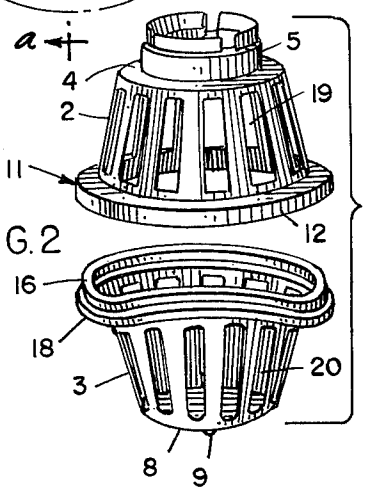
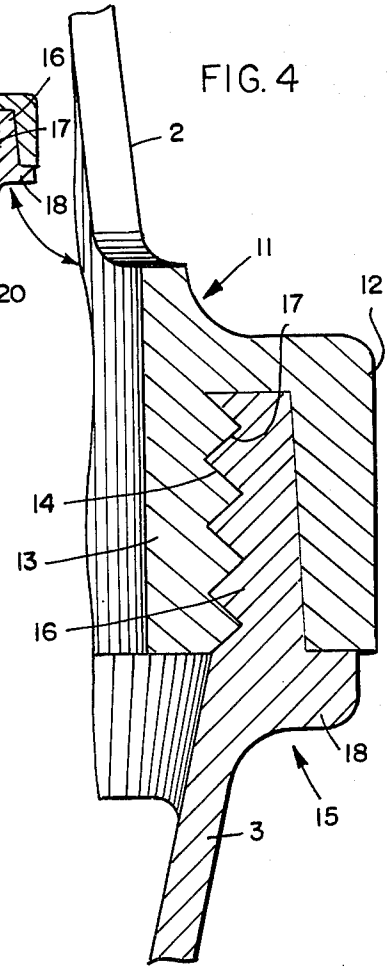


FIG. 4



LAMP GUARD

BACKGROUND OF THE INVENTION

Lamp guards molded from a transparent or translucent, flexible and heat-resistant material have been known and used heretofore, such as shown, for example, in my U.S. Pat. No. 3,767,913. Examples of lamp guards, other than the wellknown "wire cage" type, heretofore known, and formed of a transparent or translucent flexible plastic material are disclosed in U.S. Pat. Nos. 1,695,468; 2,236,940 and 3,609,348.

Such lamp guards of the prior art, however, were usually open at one end or otherwise were so constructed that they would be crushed relatively easily, if they were stepped on by a person or run over by a small vehicle.

The present invention is designed to overcome this disadvantage, and to provide a construction which is not only light weight, but extremely strong and crush-resistant.

BRIEF SUMMARY OF THE INVENTION

The invention is directed in general to a novel construction of lamp guard, formed of a transparent or translucent, heat-resistant material, such as a synthetic polymer, and which is flexible. One example of such suitable material would be nylon and another is presently marketed under the trademark Lexan.

More particularly, the invention is directed to a lamp guard, which is comprised of two annular enclosure members, comprising a base and a cap locked together by a novel threaded "tongue and groove" joint, which has been found to be resistant to crushing when a force is applied on a side thereof.

At least one of the members, and preferably both of them, have outer ends of a lesser diameter than that of the inner ends thereof. The inner end of one member has an axially extending annular groove with the face of one of the walls thereof being threaded. The inner end of the other member has an axially extending annular groove with the face of one of the walls thereof being threaded. The inner end of the other member has an axially extending annular rib or tongue received within said groove. One face of the annular rib is provided with threads which engage the threads in the groove, and when the two parts are thus locked together, there is formed a complete lamp guard which will resist crushing.

Because the inner ends of the enclosure members have a diameter larger than the diameter of the outer ends thereof, the sides of those members will be tapered or cone-shaped, although it is to be understood that the annular walls of such enclosure members can also be curved in an axial direction, if desired, rather than flat, without departing from the spirit of the invention, and the resulting resistance to crushing will still be present.

With this generally tapered configuration, a force applied at one point along the periphery of the inner end of the larger diameter will cause that end to be pushed inwardly at the point where the pressure is applied and to be forced outwardly at points 90° from where the pressure is applied. Thus, when the two enclosure members are merely held together by means such as adhesives or interengaging threads alone, the outward movement thereof 90° away from where the pressure is applied will tend to pull the members apart, and sufficient pressure will, in fact, result in a pulling apart and crushing of the members.

By providing an outer annular retaining wall or skirt, integral with one of the members, and spaced outwardly from the wall of the member, and forming the outer wall of the groove within which the annular rib on the other member is received, the members cannot be pulled apart in that area 90° from where the pressure is applied, and, therefore, cannot be crushed. In fact, such construction makes the threads hold even tighter and the tendency to pull apart increases the resistance to crushing.

If the two enclosure members were tubular, with straight sides and the same diameter at both ends, there would be no tendency for the members to pull apart 90° away from where the force is applied, and, therefore, the sides thereof would be merely flattened and crushed.

DESCRIPTION OF THE DRAWING

FIG. 1 is a longitudinal sectional view through the lamp guard, embodying the present invention;

FIG. 2 is an elevational view in perspective of the two enclosure members comprising the guard, separated and illustrating the shape assumed by the inner ends thereof when a compressive force is applied to the opposite sides thereof;

FIG. 3 shows in dot-dash lines the approximate shape of the inner end of an enclosure member in plan view, when a compressive force is applied to the opposite sides thereof; and illustrating the changes in radial dimensions which take place; and

FIG. 4 is a fragmentary, sectional view of the assembled parts of the guard, illustrating a portion of the structure of FIG. 1 on an enlarged scale.

DETAILED DESCRIPTION OF THE INVENTION

Referring now particularly to the drawing, the lamp guard in its completely assembled condition is indicated generally by the numeral **1**. The guard is comprised of two enclosure members, identified by the numerals **2** and **3**, wherein the member **2** may be considered to be the base thereof and the member **3**, the cap.

The outer end of the base **2** is indicated by the numeral **4**, and is provided with a neck portion **5**, extending outwardly therefrom. This neck may be provided with an internal annular rib, so that a hand lamp or the like, shown in phantom by the numeral **7**, may be releasably connected thereto. This construction forms no part of the present invention, but merely illustrates one manner in which a housing for the lamp bulb socket (not shown) may be provided.

When the housing for the threaded socket, whether it be a hand lamp, stringlight or other type, is connected to the base enclosure member **2**, a light bulb may be inserted into the socket, at which time the other part or cap **3** of the guard may be assembled therewith.

The outer end **8** of the cap member **3** is preferably provided with a snap-in rivet **9**, with which the end **10** of a hook member (not shown) may be assembled. This construction likewise is not a part of the present invention, but illustrates the manner in which a hook may be attached to the lamp guard, and have a universal type movement in both a pivoting and a swiveling manner.

The inner end of the base enclosure member **2** is indicated generally by the numeral **11**. This inner end is provided with an outer annular skirt **12** which is spaced outwardly from the inner wall **13** of the member **2**,

thereupon providing an axially extending annular groove.

One wall of the groove, and preferably the inner wall thereof, is provided with threads **14.**

The inner end of the cap enclosure member **3** is indicated generally by the numeral **15.** This end is provided with the annular rib **16,** one face of which is provided with the threads **17.**

When the two enclosure members are to be assembled, the annular rib forms a tongue as it is inserted into the groove of the base enclosure member **2,** and the mating threads on the rib and within the groove are engaged to lock the two enclosure members together.

The inner end of the cap member **3** may also be provided with a radially extending annular ledge **18,** adapted to abut the outermost annular edge of the skirt member **12,** and thereby form a a stop member to limit the insertion of the tongue into the groove.

Suitable openings are provided in the two enclosure members to allow ventilation, and to prevent heat build up when the lamp is being used. To this end, there is provided a plurality of circumferentially spaced, axially extending vent openings **19** in the base member **2,** and similar openings **20** are provided in the cap member **3.**

Referring now to FIGS. **2** and **3,** it will become evident that when a compressive force is applied to the sides of the assembled guard in the area where the two members are locked together the flexible nature of the guard will allow the sides to be pushed inwardly in the area where the force is applied, as shown in FIG. **2,** whereupon the normal diameter of the member will be made smaller, as indicated at *a—a* in FIG. **3.** This distortion of the inner ends of the members will cause the points approximately 90° away from where the force is applied to push outwardly, so that the diameter of these inner ends will be increased, as may be noted at *b—b* in FIG. **3.**

In this configuration of the parts, it is evident that those points at *b—b* will tend to pull apart. If the inner ends of the two members which are connected together are not confined in some way, they will, in fact, pull apart, and the compressive force thereupon will crush the two members of the guard.

There will, of course, be some slight clearance between the annular rib **16** and the adjacent faces of the annular groove, and it is therefore necessary that the depth of the threads be greater than this clearance. With the skirt **12** acting to restrain separation of the threaded parts, the outward force at the points *b—b* will actually make the threads hold even tighter and prevent the two members from pulling apart, thereupon preventing them from being crushed, and thus the arrangement provides for a much stronger assembly.

In actual practice, the depth of the threads will be approximately one-sixteenth-inch and the clearance provided is substantially 0.014-inch.

The provision of the outer ends of the members having a lesser diameter than the inner ends thereof, as described above, is a necessary feature of the invention, since it has been found that if the two members are true tubes with the same diameter throughout the length thereof, there will be no resistance to crushing, even if they are locked together by the threaded tongue and groove arrangement, described above. The general tapered configuration of the enclosure members, whether the sides are straight or curved, is the element which creates the tendency of the members to pull apart at points 90° away from where the pressure is applied. Since the members cannot pull apart for reasons above outlined, the assembled guard cannot be crushed. The greater the taper, the stronger the guard becomes. With straight sided tubular members having a constant diameter, all forces, when pressure is applied thereto, will be in the same direction. The taper of the members provides an angle so that the force applied breaks up into two forces at different angles, and, therein resides the basis for the resistance to crushing, as above described.

Changes may be made in the form, construction and arrangement of parts from those disclosed herein without in any way departing from the spirit of the invention or sacrificing any of the attendant advantages thereof, provided, however, that such changes fall within the scope of the claims appended hereto.

I claim:

1. A lamp guard comprising,

a. a first enclosure member formed of a flexible material adapted to have a lamp mounted therein, and having a circular inner end portion,

b. a second enclosure member also formed of a flexible material and having a circular inner end portion cooperating with said first enclosure member to form the completed guard,

c. the outer end of at least one of said members having a smaller diameter than the inner end thereof,

d. an axially extending annular groove around one of said members adjacent the inner end thereof having inner and outer walls,

e. an axially extending annular rib around the other of said members having inner and outer faces thereon and received within said annular groove of said one member, and

f. means removably securing said members together including interengaging threads on a wall of said groove and on a face of said rib.

2. A lamp guard, as defined in claim **1,** wherein the threads in said groove are on the inner wall thereof and the threads on said rib are on the inner face thereof.

3. A lamp guard, as defined in claim **1,** wherein said enclosure members are provided with a plurality of axially extending circumferentially spaced openings.

4. A lamp guard, as defined in claim **1,** wherein the axial length of said rib is substantially equal to the axial depth of said groove.

5. A lamp guard, as defined in claim **1,** wherein the depth of said interengaging threads is greater than the clearance provided between the faces of said rib and the walls of said groove, thereby to prevent separation of said members when pressure is applied to the guard causing flexing thereof in the area of said threads.

6. A lamp guard comprising,

a. a first annular and flexible enclosure member adapted to have a lamp mounted therein, and having a circular inner end portion,

b. a second annular and flexible enclosure member also having a circular inner end portion cooperating with said first enclosure member to form the completed guard,

c. both of said enclosure members having tapered surfaces with the inner ends thereof having a greater diameter than the outer ends thereof,

d. an axially extending annular groove having inner and outer walls around one of said members adjacent the inner end thereof,

e. an axially extending annular rib around the other of said members having inner and outer faces

thereon and received within said annular groove of said one member, and

f. interengaging threads on a wall of said groove and a face of said rib to removably secure said members together,

g. the depth of said interengaging threads being greater than the clearance between the face of said rib and the adjacent wall of said groove.

7. A lamp guard, as defined in claim **6,** wherein said annular groove is on said first member, and said rib is on said second member.

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