Dec. 12, 1967 E. E. FREEMAN, JR., ET AL 3,357,548

ARTICLE HOLDER

Filed Oct. 22, 1965

Fig. 1

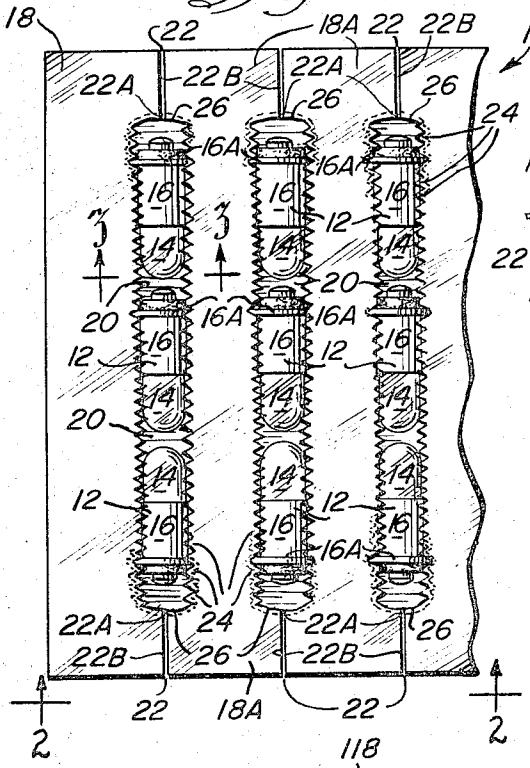
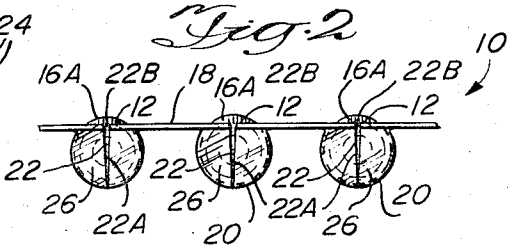



Fig. 2



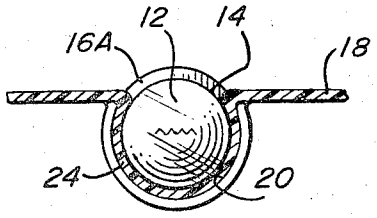




Fig. 3

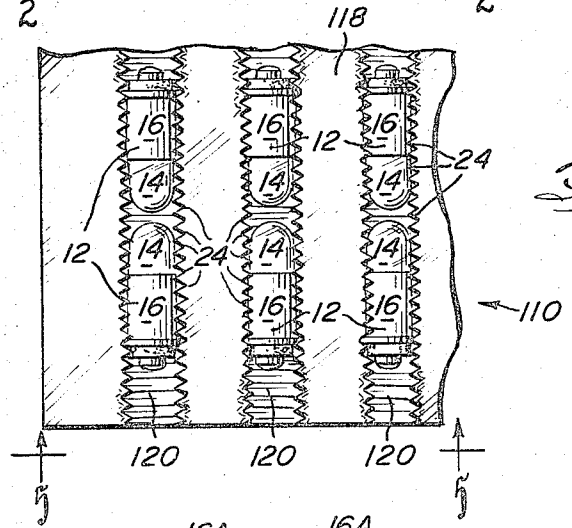



Fig. 4

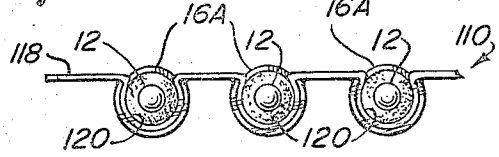



Fig. 5


INVENTORS
ERNEST E. FREEMAN, JR.
HORACE C. KREINICK
BY Mason, Fokkemainen, Rathburn & Wyss
ATTORNEYS

United States Patent Office

3,357,548

Patented Dec. 12, 1967



3,357,548

# ARTICLE HOLDER

Ernest E. Freeman, Jr., Northfield, and Horace C. Kreinick, Chicago, Ill., assignors to Chicago Miniature Lamp Works, Chicago, Ill., a corporation of Illinois

Filed Oct. 22, 1965, Ser. No. 501,252
10 Claims. (Cl. 206—56)

The present invention relates to article holders, and has for a primary object the provision of an improved holder for small articles, such as miniature lamps or the like, charcacterized in that the articles may easily be released from the holder.

As a result of technological advances and the modern trend toward miniaturization, an increasing number of small sized articles are produced. As a result, the problems arising in the handling, storing, shipping and dispensing of such articles are of importance. The present invention is directed to improved holders for miniature lamps, although it is believed that the principles of the invention are applicable as well to holders for a variety of articles including electrical components and mechanical items such as transistors, bolts, screws and the like.

Article holders comprising sheets of flexible material including depressions for holding a plurality of miniature lamps are known. Although such holders are capable of firmly holding the lamps during storage or shipping, and allow any desired number of lamps to be handled in a single package, yet such known holders have proven unsatisfactory in that it is very difficult to remove the lamps from the holder.

In particular, known holders are unsuitable for use with automatic unpacking or dispensing equipment because the force required to release a lamp from the holder varies with the position of the lamp, the lamps near the ends of each depression being held more firmly than those in the center. Additionally, with known holders it is not possible easily to release all the lamps in a single depression or in a series of depressions by means of a simple unidirectional force applied to the holder.

Accordingly, it is an object of the present invention to provide an improved article holder free from the disadvantages of known apparatus.

It is another object of the present invention to provide an improved article holder from which the held articles may easily be removed.

A further object is to provide an article holder in which the held articles may be removed by means of a simple lateral force applied to the holder.

Yet another object of the present invention is to provide an improved article holder in which the force required to release a held article is substantially the same for each article in the holder.

In brief, an article holder embodying the features of the present invention may include a sheet of flexible inelastic plastic material in which are formed a series of elongated spaced trough-like depressions, each having a length suitable for receiving a desired number of articles such as miniature lamps. The walls of the depressions are shaped to hold the articles, and frictionally engage and hold the articles in the depressions. Thus, in order to hold generally cylindrical miniature lamps, the depressions are generally cylindrical in shape, and encircle somewhat more than 180 degrees of the lamp. For articles having other shapes, the depressions may be varied accordingly.

In order that the article may readily be removed from the holder, and in accordance with an important feature



of the present invention, the sheet of flexible plastic material is discontinuous at one or both ends of each depression, whereby the articles held therein may be released by laterally separating the side walls of the depression. In one illustrated embodiment of the present invention the depressions are formed with end portions provided with slits extending away from the open side of the depressions, the slits allowing the walls of the depression to be separated in order to release the held articles.

In another embodiment, the depressions extend to the edges of the sheet of resilient material. Thus, there is no inelastic closed end of the depression to hinder separation of the depression walls.

Other objects and advantages of the present invention will become apparent from the ensuing description of illustrative embodiments thereof, in the course of which reference is had to the accompanying drawing, in which:

FIG. 1 is a plan view of a fragmentary part of an article holder embodying the present invention;

FIG. 2 is an elevational view taken along the line 2—2 of FIG. 1;

FIG. 3 is an enlarged sectional view along the line 3—3 of FIG. 1;

FIG. 4 is a plan view of a portion of an article holder comprising an alternative embodiment of the invention; and

FIG. 5 is an elevational view taken along the line 5—5 of FIG. 4.

Having reference now to the drawing, and initially to FIG. 1, there is illustrated an article holder constructed in accordance with the present invention and designated generally as **10**. The holder **10** serves releasably to hold a plurality of miniature lamps **12** each comprised of an envelope **14** and a base portion **16**.

The article holder **10** is formed from an initially flat sheet **18** of flexible inelastic plastic material, and may be of any desired length and width. The sheet **18** is provided with a series of elongated and spaced generally cylindrical depressions **20** in which the lamps **12** are held. Furthermore, and in accordance with an important feature of the present invention, the sheet **18** is provided with means including slits **22** at the ends of the depressions **20** to simplify release of the lamps **12** from the holder.

The holder **10** may be formed of plastic material by a vacuum process whereby the sheet **18** is drawn over a number of forming rods in order to form the depressions **20**. The depressions **20** are slightly greater than semi-cylindrical in shape whereby they engage more than 180 degrees of the miniature lamps **12**. The side walls of the depressions **20** are formed with a series of accordion-like pleats **24** and the bases **16** of the lamps **12** include annular flanges **16A** adapted to be received within the pleats **24** when the lamps are loaded into the holder **10**. The innermost tips of the pleats **24** are thus able to engage other portions of the lamps **12**. As clearly appears in FIG. 3, more than 180 degrees of the circumference of the lamps **12** are engaged by the pleated walls of the depressions **20** and are thereby frictionally held in place. It is believed that the lamps could be frictionally held if the depressions were only semi-cylindrical or even somewhat smaller.

The depressions **20** may be formed of any desired length in order to hold any number of bulbs in each depression **20**. The sheet **18** of flexible plastic material is somewhat wider than the length of the depressions **20**, and includes generally flat edge portions **18A** extending between the ends of the depressions **20** and the edges of the sheet **18**. The ends of the depressions **20** are defined

by end walls **26**; however, unlike those of known article holders, the end walls **26** do not impede the separation of the side walls of the depressions and the release of the articles held.

In order to allow the lamps **12** readily to be released from the holder **10**, the sheet **18** of plastic material is discontinuous at the ends of each depression **20**, this being accomplished by means of the slits **22**. Each slit includes a portion **22A** extending away from the open side of the depression in the end wall **26**, and a contiguous portion **22B** extending across the edge portion **18A** of the flexible sheet. The side walls of the depression **20** may easily be separated since the slits are able to widen, thus preventing the end walls **26** from opposing the release of the held articles.

In known holders having solid inelastic end walls, the walls prevent separation of the depression side walls and release of the held articles, and especially of the articles near the ends of the depression. An advantageous feature of the present invention resides in the fact that, due to the discontinuity of the sheet material at the ends of the depressions, the articles near the ends of the depressions are released as easily as those at the center.

The article holder **10** constructed in accordance with the present invention is easily caused to release the lamps **12** held therein. In order to release the lamps **12** from a depression **20**, it is necessary only to separate the side walls of the depression, and this may conveniently be done by applying a lateral force to the sheet **18** of flexible plastic material in a direction transverse to the length of the depression. This force causes separation of the walls of the depresson **20** and allows the bulbs **12** to be freed from the holder **10**. Furthermore, any desired number of depressions **20** may simultaneously be opened, if desired. With known article holders, difficulty is encountered in removing the articles with a simple lateral force—it often being necessary to force the articles out by pushing against the underside of the depressions.

The holder **10** may be made any desired length and may comprise a relatively short strip including a small number of depressions **20**, or may comprise a relatively long strip formed into a roll, and including a large number of depressions **20**. Thus, it can be seen that the holder **10** may serve to hold any desired number of miniature bulbs **12**.

Since a simple lateral force is effective in removing the bulbs **12** from the holder **10**, and since the force required to remove each bulb is the same, the article holder **10** constructed in accordance with the present invention is ideally suited for use with automatic dispensing or unpackaging equipment. For example, a long strip of flexible plastic material **18** can be formed into an elongated holder, and one or both of the edges **18A** of the sheet can be provided with openings (not shown) engageable with a sprocket for advancing the sheet of material to an article dispensing station. At the dispensing station, the lamps **12** can be removed either by laterally stretching the sheet in order to separate the side walls of the depressions **20**, or by moving the sheet over a roller engaging the underside of the sheet **18** whereby the depressions **20** are forced open thus releasing the bulbs **12**.

Having reference now to FIGS. 4 and 5, there is illustrated an article holder **110** comprising an alternative embodiment of the present invention. The holder **110** is quite similar to the article holder **10** described above, and includes a sheet **118** of flexible plastic material in which are formed a series of depressions **120** for holding a plurality of lamps **12**. The depressions **120** extend across the entire width of the sheet **118** to the edges of the sheet, and thus are open ended and include no end walls. Accordingly, it can be seen that the holder **110** is similar to the holder **10** in that it may easily be laterally stretched whereby the side walls of the depressions **120** are separated and the bulbs **12** are allowed to be released.



The holder **10** or the holder **110** may be used to hold articles other than the illustrated cylindrical miniature lamps **12**. For example, the holder can easily be modified to hold articles of various shapes such as cube, hexagonal and oval shaped articles and others. In order to hold an article of any desired shape, it is necessary only to form the depressions so that they engage and hold the articles.

One advantageous feature of the holders **10** and **110** constructed in accordance with the invention is that they may be subdivided by severing the flexible sheet along a line between and parallel to any two depressions, and the resulting segments comprise complete operative holders. As regards the holder **110**, it may also be severed along a line normal to the depressions to obtain narrower holders.

It should be understood that the holder **10** could include two or more shorter depressions in place of each single longer depression **20**, whereby the holder would include rows and columns of depressions each serving as an individual article holding depression. In this instance, the flexible sheet may be provided with slits similar to the slits **22**, at the ends of each depression and extending between adjacent ends of the depressions. A holder so constructed functions in the same manner as the illustrated holder **10**, but has the additional advantage that it may be severed between the rows or columns in order to separate rows or columns or individual depressions. Such separation does not impair the unloading capability of the depressions, since each depression is slit at its ends.

While the present invention has been described in connection with the details of certain embodiments thereof, it should be understood that these details are not intended to be limitative of the invention except insofar as set forth in the accompanying claims. In particular, it is believed that the features of the present invention could be used in holders for many articles including electrical components and mechanical items.

What is clamed as new and desired to be secured by Letters Patent of the United States is:

**1.** A holder for articles, said holder comprising a sheet of flexible material formed with at least one open-sided depression having side walls extending transversely of the sheet and dimensioned frictionally to hold the article, characterized in that said sheet has a discontinuity to the edge of the sheet at least at one end of the depression, whereby release of the held article from said depression may be effected by lateral separation of the side walls of the depression as by elongation or bowing of the sheet.

**2.** A holder as claimed in claim **1**, characterized in that the sheet is provided along it length with a series of longitudinally spaced apart depressions.

**3.** A holder as claimed in claim **2**, characterized in that the sheet has a discontinuity from each end of the depression to an adjacent edge of the sheet.

**4.** A holder as claimed in claim **3**, wherein said sheet material is an inelastic plastic.

**5.** A holder as claimed in claim **4**, characterized in that said discontinuities comprise depressions without end walls.

**6.** A holder as claimed in claim **5**, characterized in that said discontinuities comprise depressions extending across the width of the sheet.

**7.** A holder as claimed in claim **4**, characterized in that said discontinuities comprise depression having slit end walls.

**8.** A holder as claimed in claim **7**, characterized in that the end walls are located inwardly of the edges of the sheet and the slits are continued from the ends walls to the edges of the sheet.

**9.** A holder as claimed in claim **3** for generally cylindrical articles characterized in that the depressions are dimensioned frictionally to engage more than 180 degrees of the article.

**10.** A holder for articles, said holder comprising a

sheet of flexible material formed with rows and columns of spaced apart depressions dimensioned frictionally to hold the articles and each constituting an article holder, characterized in that said sheet is slit between the adjacent ends of adjacent depressions in a column and from the depression closest to the edges to an adjacent edge of the slit, thereby to enable the held articles to be released by laterally separating the upper edges of said depressions as by bowing or elongation of the sheet, and whereby the holder may be severed along lines between any of said rows or columns to separate rows or columns of individual article holder depressions.




**References Cited**

UNITED STATES PATENTS

| | | | |
|---|---|---|---|
| 2,720,969 | 10/1955 | Kendall | 206—78 |
| 2,883,061 | 4/1959 | Moore | 211—13 |
| 2,903,139 | 9/1959 | Penman | 206—78 |
| 3,095,084 | 6/1963 | White. | |
| 3,126,891 | 3/1964 | Caputi | 206—67 X |



DONALD F. NORTON, *Primary Examiner.*

LOUIS G. MANCENE, *Examiner.*

J. B. MARBERT, *Assistant Examiner.*