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J. M. PRINCE

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METHOD OF CONNECTING A GROMMET TO A SUPPORT

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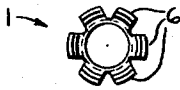


Fig.-1

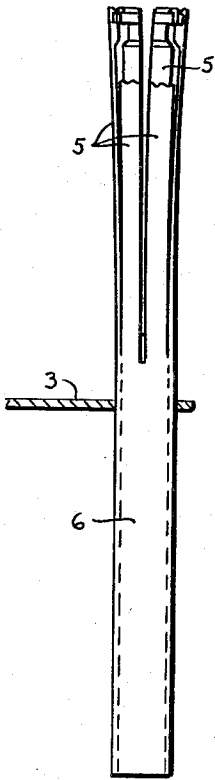


Fig.-2

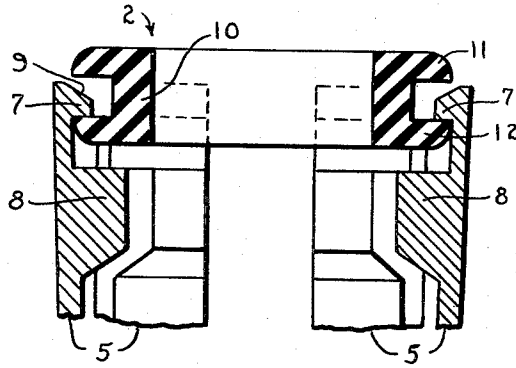


Fig.-3

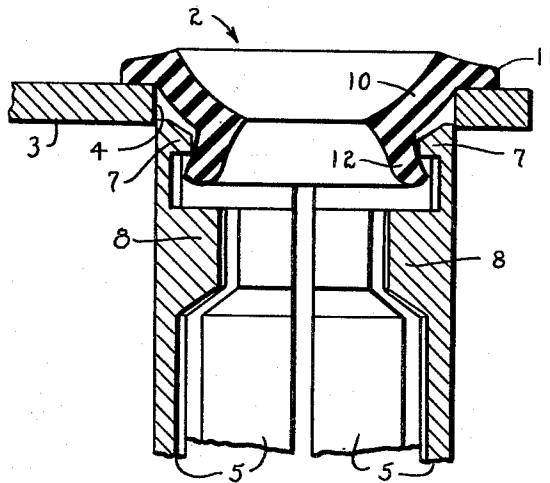


Fig.-4

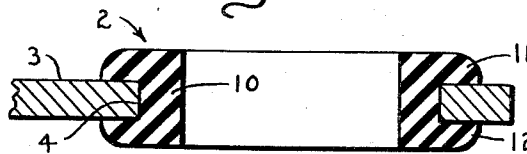


Fig.-5

INVENTOR.
JOHN M. PRINCE

BY

Charles S. Benfold
ATTORNEY

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METHOD OF CONNECTING A GROMMET TO A SUPPORT

John M. Prince, Gary, Ind., assignor to Productive Inventions, Inc., a corporation of Indiana

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The invention is directed to a unique method of attaching grommet-like items in the opening of a support and a tool or holder to assist in practicing the method.

One method currently being used to fasten grommets in place merely consists of manually pinching or contracting one end of the grommet and forcing it into the opening and then releasing the contracted end so it can expand or substantially return to its original shape. This conventional method has not proven entirely satisfactory because it is tiring and a time consuming job for any operator to compress and insert the grommets. Moreover, in some instances, the grommets are difficult to insert in the opening and the fingers of an operator are frequently injured by constant use or are cut on sharp edges defining the opening in the support.

With the foregoing in mind, an important object of the invention is to provide a novel, efficient and expeditious method whereby the disadvantages inherent in the conventional method above described are overcome.

More particularly, the method embodying the invention consists in inserting a holder, carrying a grommet having axially spaced abutments, into an opening in a support to compress or otherwise distort one of the abutments to permit passage of the grommet into the opening from one side of the support until the other abutment engages the support whereupon further movement of the holder through the opening to the opposite side of the support will release the holder from the grommet and allow the compressed abutment to automatically return substantially to its former shape to engage the opposite side of the support to lock the grommet in place with the support located between the abutments.

The method is performed by an elongated holder or tool having a handle at one extremity to facilitate manipulation of the tool and yieldable receiving means at or adjacent its other extremity to form a socket for detachably retaining a grommet therein in a manner whereby the holder may be readily released from the grommet after the grommet has been piloted or directed into the opening and is seated by the holder. The socket or receiving means for the grommet may be designed and constructed in various ways but as exemplified in the drawing preferably includes a plurality of elongated resiliently flexible fingers or jaw members which are normally spaced apart farther at their free ends than adjacent their inner ends. The inner side of the free end of each finger is preferably notched and these notches form the receiving means or socket. The fingers and socket are so constructed that a grommet can be easily inserted into the socket prior to its entry into the opening of the support and also afford a prompt release of the holder from the grommet after the grommet is properly seated in the opening.

The method is performed by a holder for the purpose described which will accommodate, within practicable limits, grommets of variable cross-sectional dimensions or sizes.

Additional objects and advantages of the invention will

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appear after the description hereinafter set forth is considered in conjunction with the drawings annexed hereto.

In the drawings:

Figure 1 is a top end view of the tool or holder;

Figure 2 is an elevational view of the holder shown in Figure 1 with portions broken away;

Figure 3 is an enlarged partial sectional view in elevation of the holder and a grommet carried thereby;

Figure 4 is a view similar to Figure 3 showing the position of the holder and grommet as they are being threaded or passed into the opening of the support; and

Figure 5 is an elevational view with the grommet in section seated in the support.

Referring more particularly to the drawing, numeral 1 generally designates the holder or tool, 2 the grommet and 3 is the support provided with an opening 4 which is adapted to receive the grommet when the holder is passed through the opening.

The holder may be designed and constructed in various ways but as exemplified in the drawings is preferably made in the form of a cylindrical tube having corresponding longitudinal slots of a length to provide corresponding longitudinally extending resiliently flexible fingers or jaw members 5 at one extremity of the holder. The opposite extremity of the holder constitutes a handle 6 to facilitate manipulation of the holder.

The holder is preferably made so that the fingers or members 5 are outturned or disposed in a diverging relationship as illustrated in Figures 2 and 3. In other words, the extremity provided with the fingers is generally in the form of a tapered cylinder, the free end of which is somewhat larger in cross-dimension than at any other location spaced longitudinally inward therefrom.

Each finger adjacent its free end is preferably provided with an internal abutment 7 and an internal abutment 8 spaced longitudinally inward and of a greater radial extent than abutment 7 to form with the abutment 8 a recess. The recesses in combination provide a yieldable or resiliently flexible receiving means or socket for the grommet as clearly exemplified in Figures 3 and 4 of the drawing. Otherwise expressed, each of the fingers is provided with a notch defined by a pair of axially spaced radial surfaces and an axial surface. It will be noted that each of the abutments 7 is tapered as indicated at 9 to assist in piloting a grommet into the socket. In other words, the tapers assist in slightly camming the fingers outwardly while the grommet is being inserted into the socket. The grommet may be slightly compressed during the insertion into the socket and may be gripped or placed under compression when properly carried by the holder as shown in Figure 3, prior to connection with the support 3. The abutments 8 are desirable and may serve to limit movement of the grommet into the socket but may be eliminated, in which event the abutments 7 will serve this purpose.

The type or kind of grommet preferably adapted for use with the holder is generally cylindrical and tubular and provided with an exterior groove to form a neck 10 and a pair of corresponding axially spaced apart ends or abutments 11 and 12 between which the abutments 7 on the fingers are located when the grommet is disposed in the holder. Attention is directed to the fact that the diameter of a portion of the holder and the diameters of the neck and opening are more or less the same so that the fingers 5 will move radially inward when the holder is passed through the opening and the grommet will properly fit in the opening of the support. It is to be understood that the method and holder can be utilized to assemble grommets of different kinds, shapes and sizes with a support.

The method of assembling or transferring the grommet on the holder to the support is novel and expeditious and

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is readily accomplished by merely inserting the handle 6 of the holder into the opening 4 and threading or passing the holder through the opening 4 which is of a size to cam or urge the fingers inwardly to distort or compress the end 12 of the grommet and as the opposite end 11 of the grommet engages the upper side of the support as shown in Figure 4 to prevent the grommet from being carried entirely through the opening, the holder will direct the end 12 of the grommet to the underside of the support and clear the opening so that the fingers are free to flex outwardly and facilitate detachment of the holder from the grommet, whereupon the end 12 will automatically return to its original shape or flip into engagement with the underside of the support with the support disposed between the ends 11 and 12 of the grommet to interlock the grommet and support as shown in Figure 5. This method has proven to be very efficient, practical and expeditious in use and only one fast stroke of the holder through the support is required to transfer the grommet from the holder into connection with the support.

Having thus described my invention, it is obvious that various modifications may be made in the same without departing from the spirit of the invention; and, therefore, I do not wish to be understood as limiting myself to the exact form, construction, arrangement, and combination of parts herein shown and described.

I claim:

1. A method of transferring a resilient grommet, detachably held in an assembly tool, to a support provided with an opening therein, which consists in inserting and moving the entire tool in one continuous direction through the opening to cause a portion of the grommet to engage one side of the support and distort and force another portion of the grommet through the opening, and then releasing the tool from the grommet after the tool passes entirely through the opening so that said another portion will substantially return to its original shape and engage the other side of the support and thereby secure the grommet thereto.

2. A method of assembling a resilient grommet having enlarged ends with a support provided with an opening therein, which consists in seating one end of the grommet in an assembly tool and moving the entire tool in one continuous direction through the opening to cause said end to pass through the opening with its other end engaging one side of the support, after which the tool is released from the grommet so that said one end may return to substantially its original shape at the other side of the support and thereby secure the grommet in the opening with the support disposed between the ends of the grommet.

3. A method of assembling a resilient grommet having enlarged ends with a support provided with an opening therein, which consists in seating one end of the grommet in one extremity of an elongated assembly tool, inserting the opposite extremity of the tool into the opening and moving the tool in the opening until the other end of the grommet engages one side of the support, then pulling said one end entirely through the opening, after

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which the tool in passing entirely through the opening is released from the grommet so that said one end may return to its substantially original shape to engage the other side of the support and thereby secure the grommet in the opening with the support disposed between the ends of the grommet.

4. A method of transferring and connecting a resilient grommet, detachably held by yieldable members of an assembly tool, to a support provided with an opening therein, which consists in moving the entire tool in one continuous direction through the opening to cause the members to move toward one another to firmly grip and distort one enlarged portion of the grommet so that as this portion is being directed through the opening another enlarged portion of the grommet will be located at one side of the support, and then releasing the tool from the grommet after the tool and said one portion of the grommet pass entirely through the opening to the other side of the support to permit said one portion to substantially return to its original shape at the said other side of the support with said support disposed between said portions.

5. A method of transferring and connecting a resilient grommet, detachably held in a yieldable socket of an assembly tool to a support provided with an opening therein, which consists in moving the entire tool through the opening in one direction to cause contraction of the socket to distort one portion of the grommet so that as it is being pulled through the opening another portion of the grommet will engage one side of the support, and then releasing the tool from the grommet after the tool and said one portion of the grommet pass entirely through the opening to the other side of the support to permit said one portion to substantially return to its original shape and engage said other side of the support and thereby connect the grommet to the support.

6. A method of transferring and connecting a resilient member having a neck and enlarged portions to a support having a planar part provided with an opening of a size less than the enlarged portions of the member, which consists in placing one portion of the member in a yieldable socket at one end of an elongated assembly tool, inserting the other end of the tool into the opening and directing the tool entirely through the opening in one continuous direction so that the yieldable socket will engage the margin of the opening to cause contraction of the socket and compress the said one portion of the member, and directing said compressed portion through the opening to locate the neck of the member in the opening while causing the other portion of the member to engage one side of the support so that after the tool passes entirely through the opening the socket will automatically expand and release the compressed portion of the member for expansion against the opposite side of the support.

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