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Hinsperger

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[54] **FASTENER FOR FLEXIBLE SHEET MATERIAL**

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[52] **U.S. Cl.** ..... **24/16 PB,** 24/90 W, 24/245 R

[51] **Int. Cl.** **A44b 21/00,** B65d 63/00

[58] **Field of Search** ..... 24/90 W, 90TS, 116 A, 150 FP, 245 R, 90 HA, 245 FF, 16 PB, 30.5 P, 17 AP; 292/322

[56] **References Cited**

UNITED STATES PATENTS

2,472,235	6/1949	Sullivan	24/245 R
3,072,986	1/1963	Lefnaer	24/16 PB
3,172,178	3/1965	Copell	24/116 A X
3,290,080	12/1966	Dawson	292/322
3,349,447	10/1967	Raleigh	24/90 W
3,422,504	1/1969	Brown	24/245 FF
3,467,999	9/1969	Bjorksten et al.	24/245 R
3,530,543	9/1970	Desmarais et al.	24/16 PB

FOREIGN PATENTS OR APPLICATIONS

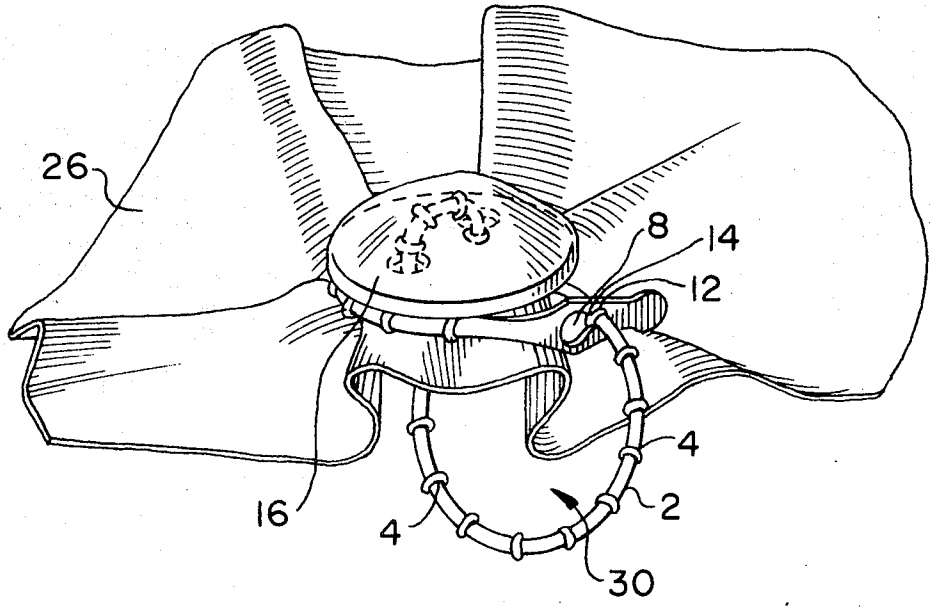
206,765	6/1955	Australia	24/90 HA
1,254,375	1/1961	France	24/16 PB
1,083,684	9/1967	Great Britain	24/116 A

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[57] **ABSTRACT**

A fastener for flexible sheet material, such as cloth, plastic sheeting, tarpaulins, and the like is disclosed. The fastener consists of an elongate cord member having enlarged or bulbous portions provided at spaced distances therealong, with one end of the cord having a flattened tab portion and an aperture thereon to receive the other end of the cord member which passes therethrough to form a loop portion. The said other end of the cord is then attached to a button member. In use, the button is positioned on one side of a sheet of material and the loop portion passed over the button from the other side of the sheet carrying a portion of the sheet material therewith. The tab is then moved along the cord to close the loop to a diameter smaller than the button and securely hold the fastener to the sheet material. The aperture in the tab portion is provided with a contiguous slot opening in which the cord is fitted after the loop is tightened. The slot is of a width to receive the cord but the width is less than the diameter of the enlarged portions to prevent longitudinal movement of the cord with respect to the slot. The fastener may be used with any flexible sheet material and is re-usable any number of times without damage to the sheet material.

9 Claims, 6 Drawing Figures



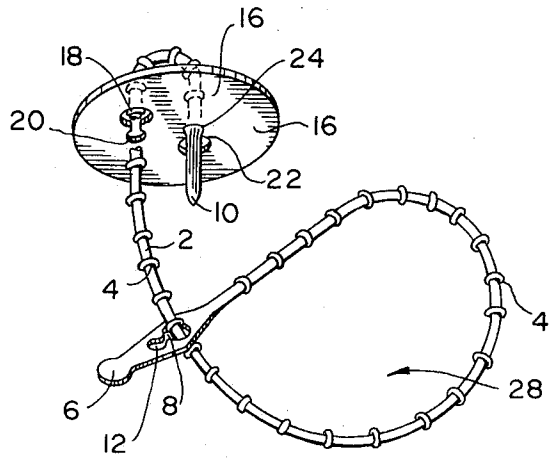


FIG. 1

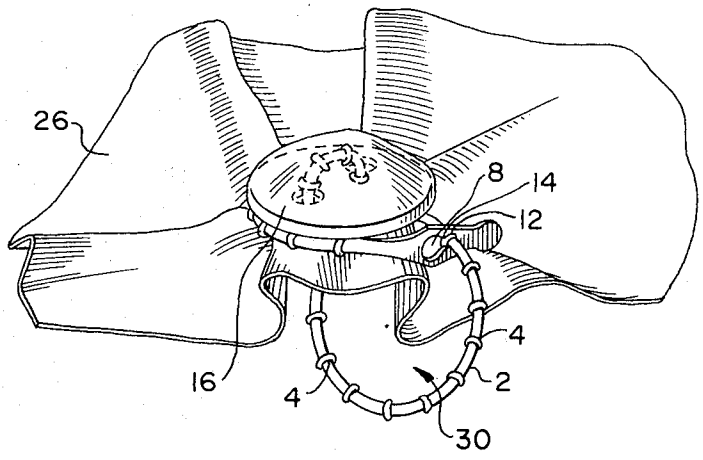


FIG. 2

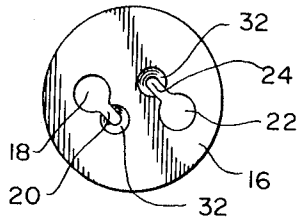


FIG. 3

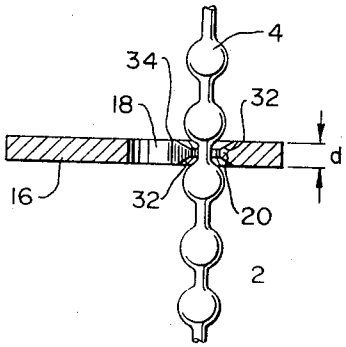


FIG. 4

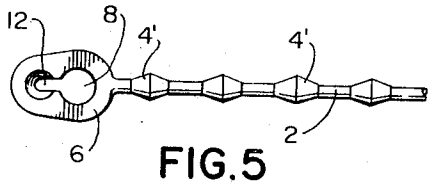


FIG. 5

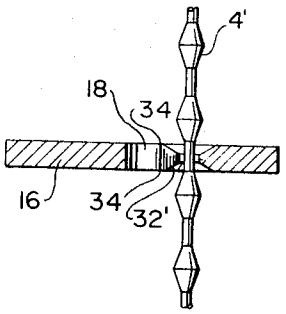


FIG. 6

FASTENER FOR FLEXIBLE SHEET MATERIAL

The present invention relates to a fastener or fitment for attachment to and for securing cloth or sheet textile material or sheeting or films of synthetic material, such as polyethylene and other synthetic and non-synthetic material, and for tarpaulins, and the like.

It is usual in the case of sheeting used to cover various articles to provide the sheeting with holes around their periphery with grommets in the holes so that securement means may be passed through the holes to secure the sheeting or cover to the article. With this arrangement, the holes are pre-arranged and the positioning of the holes is not correct for any particular application. An alternative method when choosing, for example, a sheet of polyethylene as covering material, is for the user to punch holes in the sheet at the desired locations and to insert a rope or similar fastening means through the holes to obtain the desired securement. Here again, the disadvantage is that once the holes are punched they always remain and when the tarpaulin is to be used in other applications, new holes must then be provided.

Other methods for securing cloth or tarpaulins or other sheet-like material are in general use, such as by simply tieing corners of such sheets by string or rope but these methods do not provide for fail-safe fastenings and are generally disadvantageous because of the length of time necessary in which to complete the securement.

The present invention overcomes the disadvantages and problems encountered with prior art cloth or sheet fasteners or fitments by providing a device which may be readily and quickly secured to any portion of the cloth or sheeting without the necessity of having to provide any holes in the sheeting. Moreover, the fastener can be positioned and re-positioned on any portion or in any area of the sheeting with ease and simplicity providing a fastening structure which is secure in installation and which is re-usable any number of times with any type of flexible film or sheet or textile material.

In its basic concept, the fastener according to the present invention consists of an elongate cord member having a substantially constant cross-sectional area or diameter throughout the greater portion of its length and having enlarged or bulbous or other configured portions provided at uniformly spaced distances along the cord with the enlarged or bulbour or other configured portions having an area or diameter in cross-section greater than the cross-section area or diameter of the cord itself. One end of the elongate cord member is provided as a flattened tab portion having an aperture or opening therein with the aperture having a diameter of a size sufficient to receive the enlarged portions on the cord whereby the other end of the cord may be passed through the aperture to form a loop section. The other end of the elongate cord member is secured to a button or disc member of generally planar configuration, and which, while it is preferably rounded, may be hexagonal, or polygonal as desired. Additionally, the edges of the button portion may be serrated or roughened as desired.

Although the other end of the cord member may be secured to the disc or button member in any suitable manner, it is preferred to provide the button portion with two spaced apart apertures or openings with these two openings being of sufficient size to receive the cord

and enlarged portions. In securing the other end of the cord to the button, the other end of the cord is first inserted in one of the apertures in the button and then passed in the opposite direction down through the other aperture in the button in the opposite direction. In order to secure the cord to the button portion, additional apertures or slots contiguous with the apertures are provided to receive the portions of the cord between enlarged portions. The diameter or width of the additional contiguous slots are of a size to receive the cord portion but are smaller than the diameter of the enlarged portions with the result that when the cord is positioned in the contiguous slots, longitudinal movement of the cord in the slots is prevented by enlarged portions. Suitable provisions may be made to ensure that the cord will remain in the contiguous slots and not pass back into the apertures and various embodiments for such constructions will be discussed in more detail below when the invention is described in more detail.

The aperture in the tab portion is also provided with an adjacent contiguous slot to receive the cord, with the dimensions of this contiguous slot being similar to those provided in the button to maintain the cord in position and prevent longitudinal movement of the cord with respect to the tab.

When being readied for use, the disc or button end of the cord is inserted through the aperture in the tab end, and is then secured to the button or disc member by being secured in the slots as discussed above. The device ready for use then consists of a closed loop portion and a button portion provided on the button end of the cord. To secure sheeting, such as cloth or a tarpaulin, the button portion is placed against the sheeting and the open loop portion is positioned on the other side of the sheeting and passed over the button portion holding the sheeting therebetween. The tab portion is then tightened along the cord member to a position to provide a loop diameter less than the diameter of the button and the cord is then snap-locked or secured in the contiguous slot in the tab section to provide a secure fastening arrangement. This arrangement provides an open loop section adjacent the fastener whereby the sheeting may be secured to any object by hooking the looped portion over the object or by utilizing additional fastening means such as rope or string to secure the sheeting in position.

It is an object of the present invention then to provide a fastening or fitment for flexible sheet material consisting of an elongate cord member having enlarged portions provided at spaced distances therealong over substantially the entire length of the cord member with one end of the cord member being provided as a tab section having an aperture therein receiving the other end of the cord to form a loop with the other end of the cord then being secured to a button or disc member, and which fastening can be quickly and easily secured to cloth or sheeting without puncture of the sheeting and which is re-usable any number of times. These and other objects of the present invention will be described with reference to the accompanying drawings, wherein:

FIG. 1 illustrates a device according to the present invention ready for use as a fastener or fitment for cloth or sheeting or any type of material;

FIG. 2 illustrates the securement of the device shown in FIG. 1, in position on a sheet of flexible material;

FIG. 3 is an enlarged top view of a button member showing a further embodiment for securing the cord in locked position in the button;

FIG. 4 is a sectional view of the button embodiment shown in FIG. 3, and illustrating the positioning of an elongate cord member in the button portion;

FIG. 5 shows a portion of a further construction of a cord member having enlarged portions of the cord formed in double-cone configuration as shown; and

FIG. 6 is a sectional view of a configuration of a button member for use with the cord as shown in FIG. 5.

Referring now to the drawings in detail, FIG. 1 illustrates a fastening according to the present invention ready for securement to a flexible sheet. The fastening consists of an elongate cord member 2 which has a substantially constant area or diameter through a greater portion of its length. Spaced at equal distances along the cord member 2 are a number of enlarged or bulbous or other configured portions 4, having a cross-sectional area of diameter greater than the diameter of the cord member itself. One end of the cord is provided with a tab 6 having an aperture 8 provided therein to receive the other end or button end 10 of the cord as shown in FIG. 1. The aperture 8 has a diameter greater than the enlarged portions 4 with the result that the other or button end 10 of the cord may be passed through the aperture 8 without difficulty. Adjacent to and contiguous with aperture 8 is a contiguous slot 12 which has a width of substantially the same size as the diameter of the cord 2 with this width being smaller than the diameter of the enlarged portions 4 on the cord. Thus, to secure the cord against longitudinal movement with respect to tab 6, the cord is snapped into the slot 12 in a manner as shown in FIG. 2. If desired, the slot 12 may be provided with a constricted area 14 adjacent the portions of joinder of the aperture 8 and slot 12 whereby the cord "snaps" into the slot and is maintained therein due to the presence of the constricted area.

The other or button end 10 of the cord section is secured to a button or disc 16 by passing upwardly through aperture 18 having a contiguous slot 20 and then downwardly through an aperture 22 having a contiguous slot 24.

The dimensions of the apertures 18, 22 and the slots 20, 24 are similar to the dimensions of aperture 8 and slot 12 in the tab 6 so that the other end 10 of the cord may be securely fastened to the bottom 16 by "snapping" the cord into the contiguous slots. Of course, only one aperture and contiguous slot are necessary to secure the button end 10 of the cord to the button, but the provision of two apertures with contiguous slots as shown is preferred.

In use a portion of sheeting 26 is positioned over the button 16 on the side of the button remote from the loop section 28 (see FIG. 1). The loop section 28 which at this time has a diameter greater than the diameter of the button is then positioned against the sheeting on the surface thereof remote from the button and the loop section is passed down over the button carrying the sheeting therewith and the tab 6 is then tightened along the cord to provide a loop section having a diameter less than the diameter of the button shown in FIG. 2 and the cord is then fitted into the contiguous slot 12 with the result that the device is then securely fastened to the sheeting as shown in FIG. 2. This fastening results in the cord forming a loop portion 30 which is used as means for securing the fastening and sheeting to any desired article or object.

Of course, it will be appreciated that loosening the cord from within the contiguous slot 12 provided in the tab 7 will enable removal and re-positioning of the fastening at any desired position on the sheeting. Of course, it will also be appreciated that the fastening of the invention may be used over and over again with various types of flexible sheeting and can be made of any size suitable for any particular application.

The materials employed in the construction of the fastenings are of course not critical but preferred materials for the cord are synthetic plastic material such as polyethylene which has flexibility and limited resiliency and has been found quite suitable for this use. Other suitable synthetic materials, however, can be employed to advantage. Additionally, the button portion may also be made of synthetic plastic as polyethylene or the like, although the button may also be made of other materials, such as metal, and the like. Of course, the fastening is most economically manufactured by fabricating the component parts by various techniques known in the plastic art, such as by injection molding.

Alternate methods of securing the cord portion to the button and to the tab are shown in accompanying FIGS. 3, 4 and 5.

FIG. 2 is an enlarged top view of a further embodiment of the button portion 16 shown apertures 18 and 22 having contiguous and adjacent slots 20 and 24, respectively. In this particular embodiment, rather than providing a constricted portion adjacent the meeting points of the apertures and slots, the slots are provided as elongate slot openings having widths which are constant throughout their length. Adjacent to or around the end of the slots or at some position therealong the button is provided with recessed or curved concave areas 32 on both sides of the button as shown in FIGS. 3 and 4. For use with this disc, an elongate cord member similar to that shown in FIG. 4 is preferably used. The enlarged or bulbous portions 4, generally spherical are provided on the cord member 2, and equidistantly spaced along the cord and in a preferred construction facing surfaces of adjacent bulbous portions 4 are spaced aprart a distance less than the thickness of the button 16 as shown in FIG. 4. Also of course the diameters of the bulbous portions are greater than the width of the contiguous slots 20 and 24 to prevent longitudinal movement of the cord in the slot when the cord is positioned in the slot. The width of the slots 20 and 24 are or a size to receive the uniform diameter portion of the cord so that the cord portion may slide into the slot 20 as shown in FIG. 4. The enlarged portions shown in FIG. 4 are spaced apart a distance less than the thickness d of the disc and the surfaces of the concave recesses for each slot are spaced apart a distance substantially equal to the distance apart of the enlarged portions on the cord with the result that the cord will snugly be received in the slot as shown in FIG. 4. The recesses are provided adjacent to the end of or along the length of slots 20 and 24 with the result that the thickness of the portion of the button at the point of joinder of the apertures 18 and 22 and slots 20 and 24 is equal to the thickness of the button, and, to press the cord into the slots with the enlarged or bulbous portions falling in the recesses, it is necessary to exert pressure against the cord in the direction of the slot with the result that the enlarged portions in contact with oppo-

site sides of the disc are forced slightly apart against the limited elasticity of the cord **2** to enable the cord to be received in the slot recesses. It will be appreciated that FIG. **4** illustrates an enlarged section of this arrangement, and the depth of the recesses, etc., is somewhat exaggerated for purposes of illustration.

While FIGS. **3** and **4** show the apertures and slots provided in the button **16**, it will be apparent that a similar arrangement is provided for the aperture provided in the tab **6**.

Also, it will be appreciated that the enlarged or bulbous portions shown in FIG. **4** could be spaced a distance apart greater than the thickness d of the button and that slight longitudinal movement of the cord with respect to the button in either direction will result in a bulbous portion being received in a respective recesses portion to maintain the cord in the contiguous slot.

A further embodiment of a suitable cord member is shown in FIG. **5** with the enlarged portions **4'** on this particular cord embodiment being of a double-cone configuration providing cone surfaces on each side of the enlarged portions. Using the specific embodiment of FIG. **5**, a slot arrangement having a substantially uniform width throughout its length is preferred, and as shown in FIG. **6**, the recesses **32'** may be of tapered or conical configuration to receive the cone surfaces of the enlarged portions. The cone-shaped enlarged portions may be spaced apart a distance with respect to the thickness of the button as shown in FIG. **6** to provide the snap-lock feature, or they may be spaced apart at greater distances as desired. With this latter arrangement, tension in the cord when the tab is tightened into sheet holding position imparts a wedging action to hold the conical enlarged portion in the recess portion.

Additionally, and with reference to FIG. **5**, the conical surfaces of the enlarged portions as well as the recessed areas as shown in FIG. **6** can be provided with serrations or tapering grooves to increase the holding force of the enlarged portions in the recessed portions.

To assist insertion of the cords shown in FIGS. **4** and **6**, into the button and tab, the areas bordering the apertures **18** and **22** and the contiguous slots **20** and **24** may be somewhat rounded as at **34** to facilitate insertion.

In the attached drawings the button portion **16** is shown as being planar, with the cord portion being secured thereto by the apertures and slots provided. However, the button portion could be spherical or hemi-spherical or any desired non-planar shape, with the button end of the cord being secured thereto, after being passed through aperture **8** of the tab **6** by any suitable means such as by plastic fusion, welding, adhesives, etc.

Additionally a button could be molded on the button end of the cord after formation of the cord and after the button end of the cord is passed through the aperture **8** of the tab **6**.

While various embodiments for providing means for securing the cord in the contiguous slots of the tab and of the button are shown and described in this specification, it will be clear that various and other means and arrangements may be used without departing from the scope of the present invention.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A fastener for flexible sheet material comprising an elongate cord member, having a substantially constant diameter throughout a portion of its length, one end of the cord member being formed as a tab portion and the other end being adapted to be secured to a button member, the cord member being provided with enlarged portions spaced apart throughout a portion of its length, the said other end of the cord member passing through an aperture in the tab member to form a loop prior to the securement of the said other end to the button member, and there being a slot in the tab contiguous with the aperture, the slot being of a width to receive the cord member but being less than the size of the enlarged portions whereby any substantial longitudinal movement of the cord member is prevented when the cord member is positioned in the contiguous slot.

2. A fastener according to claim **1**, wherein the button member is provided with at least one aperture of a size to receive the said enlarged portions of the cord member, and there being a slot adjacent and contiguous with the said at least one aperture, the slot being of a width to receive the cord member but being less than the size of the enlarged portions to prevent longitudinal movement of the cord member with respect to the button member when positioned in the slot.

3. A fastener according to claim **2** wherein the button member is provided with two apertures each having contiguous slots, the cord member being secured to the button member by passing upwardly through one of the apertures and downwardly through the other of the apertures and being positioned in the contiguous slots.

4. A fastener according to claim **1**, wherein the surfaces of the tab and button members adjacent the contiguous slots are concavely recessed or bevelled to snugly receive the enlarged portions when the cord member is positioned in the contiguous slots.

5. A fastener according to claim **4**, wherein facing surfaces of adjacent enlarged portions are spaced apart a distance less than the thickness of the button member and tab portion whereby the facing surfaces are received in the said recesses provided on opposed surfaces of the tab and button members.

6. A fastener according to claim **5**, wherein the enlarged portions are of generally spherical configuration and the concave recesses are of hemispherical configuration.

7. A fastener according to claim **5**, wherein facing surfaces of adjacent enlarged portions are of conical configuration and the recesses are of conical configuration.

8. A fastener according to claim **1** wherein the cord member is made of polyethylene.

9. A fastener for flexible sheet material comprising an elongate cord member one end of which is formed having a tab portion, the other end of the cord member passing through an aperture provided in the tab member, and a button portion having a greater diameter than the aperture secured to the said other end, and means to removably attach the tab portion to the cord member at desired positions throughout its length.

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