Dec. 14, 1965 C. M. DOLE, JR 3,223,098

COLLAPSIBLE SHELTER CONSTRUCTION

Filed Sept. 12, 1963 3 Sheets-Sheet 1

FIG. I

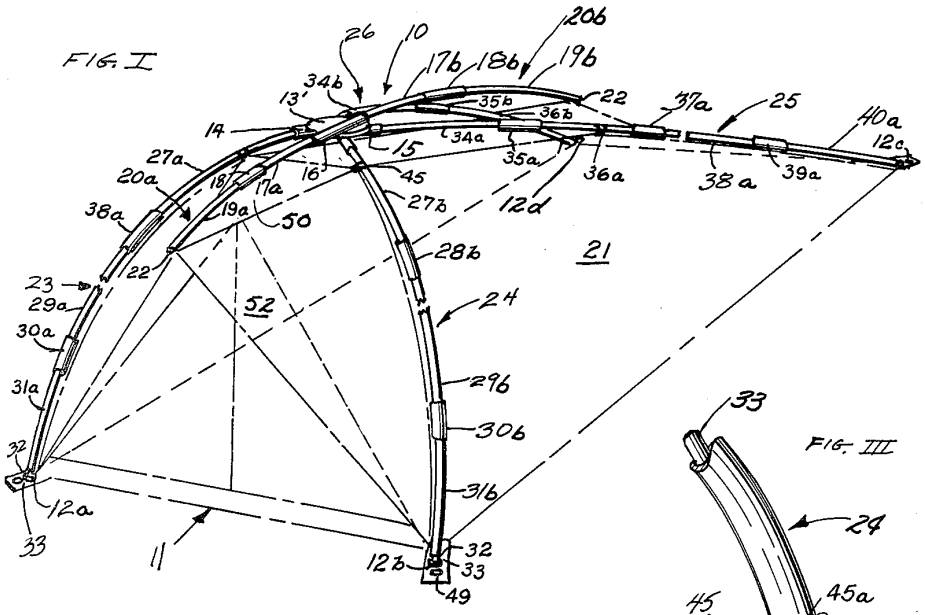


FIG. III

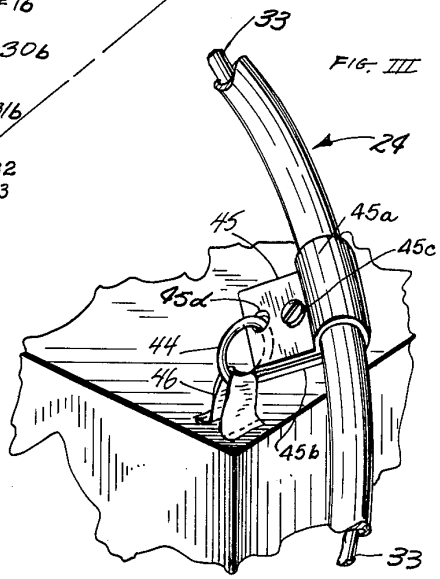
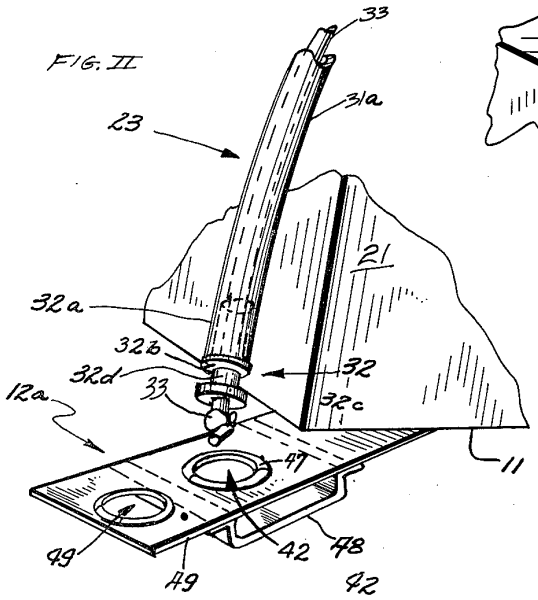


FIG. II



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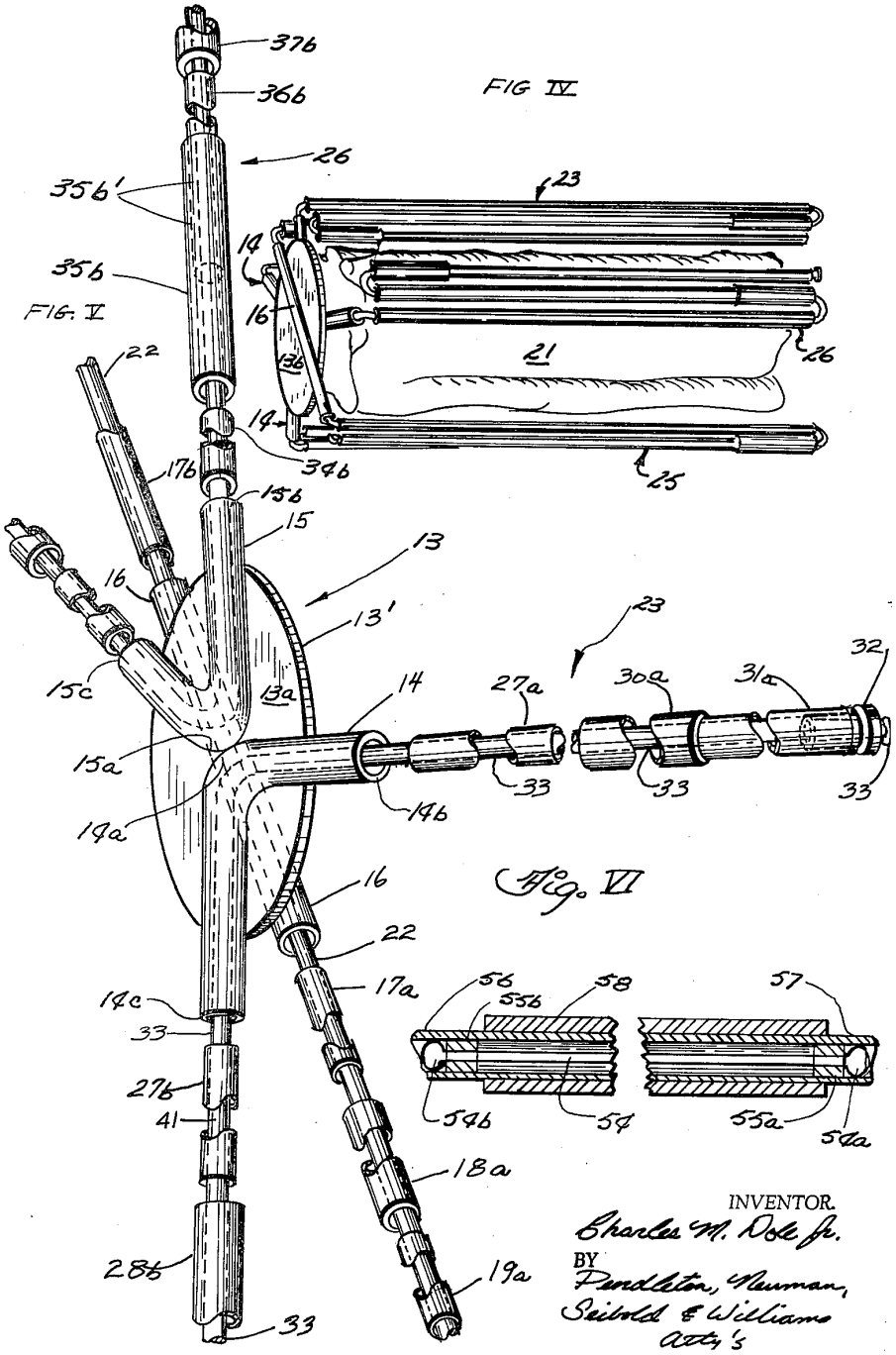
COLLAPSIBLE SHELTER CONSTRUCTION

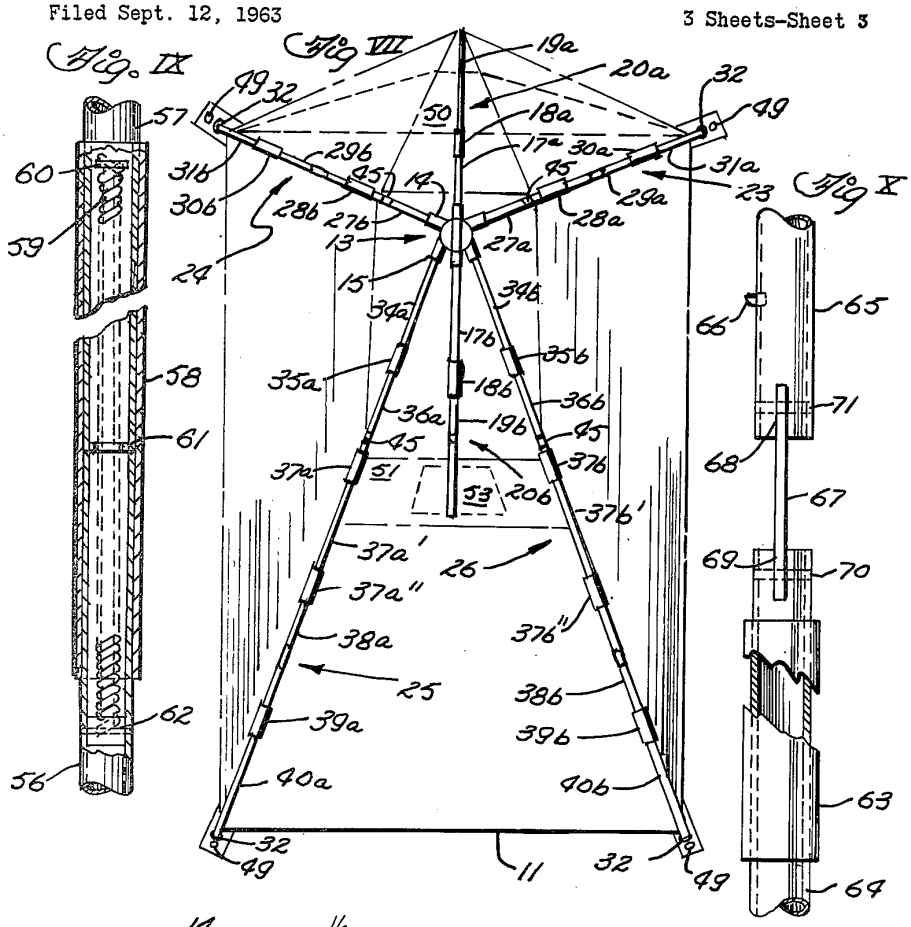
Filed Sept. 12, 1963 3 Sheets-Sheet 2

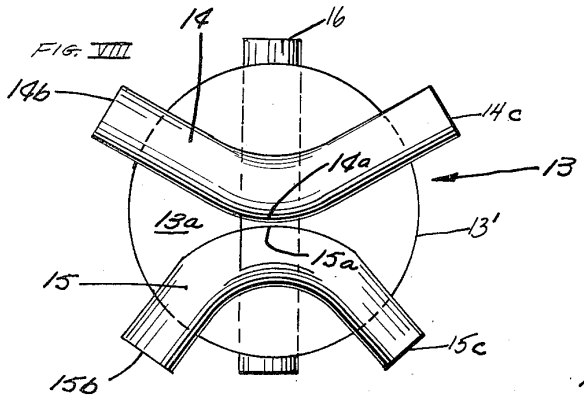


Dec. 14, 1965 C. M. DOLE, JR 3,223,098

COLLAPSIBLE SHELTER CONSTRUCTION

Filed Sept. 12, 1963 3 Sheets-Sheet 3





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COLLAPSIBLE SHELTER CONSTRUCTION

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2 Claims. (Cl. 135—4)

This invention relates to the construction of shelters and more particularly to the construction of improved collapsible shelters.

In recent years many shelters have been developed utilizing frame members which are disposed exteriorly of the shelter enclosure. While facility in the erection and collapsing of such shelter structures has been greatly enhanced through the elimination of awkward procedures such as the erection of poles within a partially collapsed tent, such structures remain beset with one or more of the following shortcomings, such as, (a) the exterior framework is comprised of a multitude of individual parts which must be severed prior to the compaction of the shelter and its framework into an easily portable package, (b) the severed parts are very susceptible to being mislaid or lost during the collapsing and/or transportation of the shelter, (c) the fitting together of individual pieces of the shelter framework is often tedious and difficult, (d) the shelter enclosure is not an integral component of the entire shelter structure, (e) many of the structural parts are of such unwieldly shapes and sizes that the folding and packing thereof consumes excessive time, and (f) fabrication of the relatively complex prior art structures is costly.

Accordingly, it is one of the objects of this invention to provide a collapsible shelter construction which is not beset with the aforenoted shortcomings.

It is a further object of this invention to provide a shelter construction which is quickly set up and collapsed.

It is a still further object of this invention to provide a shelter construction having a sectioned exterior framework, the individual sections of which remain interconnected whether in set-up, collapsed, or folded condition.

It is a further object of this invention to provide a shelter construction which is foldable into a very small package to facilitate the transportation thereof.

Another object of this invention is to provide a shelter construction which is complete within itself and thus requires no components other than those included in the single shelter unit.

Further and additional objects will appear from the description, accompanying drawings, and appended claims.

In carrying out this invention in one form, an exterior framework having four tubular legs depending from a common junction or peak plate is provided, each leg being constructed of a plurality of hollow sections fabricated from resilient materials such as aluminum and/or fiberglass. Interconnecting the individual sections and passing through the interior portions thereof are elastic cords which are kept under partial tension to urge the individual sections to assume set-up positions when they are collapsed and to urge the sections to remain in set-up position once they are set up.

Erection of the shelter is accomplished by inserting the foot of each leg into sockets provided respectively therefor on tabs extending from each of the four corners of the floor of the shelter which results in the legs assuming a bowed or arched position. The shelter enclosure or tent cloth, being permanently attached to each of the four legs, automatically distends to its predetermined set-up position immediately upon anchoring the feet of the legs into their respective tab sockets.

To collapse the shelter the leg sections are disconnected and are foldable along the ready-made pivotal

axes provided by the interconnecting elastic cords into a very small and portable package.

For a more complete understanding of this invention, reference should now be had to the drawings, wherein:

FIGURE I is a perspective fragmentary view of the set-up frame for the collapsible shelter construction and showing the shelter enclosure in broken lines.

FIGURE II is an enlarged fragmentary perspective view of one frame leg about to assume a set-up position.

FIGURE III is an enlarged fragmentary perspective view of one of the permanent connections between the shelter enclosure and a frame leg.

FIGURE IV is a side elevational view of the collapsible shelter in its folded compacted position.

FIGURE V is an enlarged fragmentary perspective view of the underside of the common junction and the interconnected individual sections which are telescopically fittable into it.

FIGURE VI is an enlarged fragmentary sectional view of one alternate construction for a frame leg section connector.

FIGURE VII is a top plan view of the collapsible shelter construction shown in FIG. I.

FIGURE VIII is an enlarged bottom plan view of the common junction shown in FIG. V.

FIGURE IX is an enlarged fragmentary sectional view of a second alternate construction for a frame leg section connector.

FIGURE X is an enlarged fragmentary view partially in section of a third alternate construction for a frame leg section connector.

Referring now to the drawings and more particularly to FIGURES I, II and VII, a collapsible shelter construction **10** is shown which has a pliable clothlike shelter enclosure or tent member **21** provided with a substantially rectangular base or floor portion **11**. The embodiment shown is of a type suitable for use as a two-man explorer tent or shelter, it being understood, of course, that the invention is not to be limited to a structure of this precise character. The application of the improved shelter construction to a two-man shelter, is merely by way of example for the purpose of facilitating understanding of the invention.

The floor portion **11**, in this instance, includes a plurality of radial apertured tabs **12***a*, **12***b*, **12***c* and **12***d* respectively which extend from and are appended to each of the four corners thereof. The function of these tabs will be described more fully hereinafter.

Supporting the tent member **21** in an erected position and disposed exteriorly thereof is a collapsible frame **10**, which in the illustrated embodiment, includes four elongated legs **23**, **24**, **25** and **26** and two peak bars **20***a* and **20***b*, all of which project or depend from a junction unit **13**. Unit **13** is normally disposed at the highest point of shelter frame **10**, when the latter is in erected operating condition. Unit **13**, in this instance, includes a disc or plate **13′** and a substantially V-shaped front ferrule section **14** and a substantially V-shaped rear ferrule section **15** both of which are disposed on and affixed to the underside **13***a* of plate **13**, as shown in FIGURES V and VIII. Front section **14** and rear section **15** are disposed on plate **13′** so that their respective bends **14***a* and **15***a* are arranged adjacent each other, the bisectors of each lying in substantially common planes.

Mounted on and affixed to the top side **13***b* of plate **13′** is an elongated peak ferrule section **16** the longitudinal axis of which is disposed substantially fore and aft, see FIG. VII. Disposed telescopically within opposite ends of peak section **16** are bars **20***a* and *b*, each of which includes a tubular section **17***a* or **17***b* which has an outside diameter roughly corresponding to the inside diameter of peak section **16**. Affixed to and co-axial with the distal

or outer end of either section 17*a* or *b* is a second tubular section 19*a* or *b* which is of substantially like dimension to that of section 17*a* or *b*. To retain the sections 17*a*–19*a* or 17*b*–19*b* in proper relation with respect to one another when the frame is set up, a sleeve section 18*a* or *b* is provided. The ends of section 18*a* or *b* are adapted to receive the adjacent ends of sections 17*a* or *b* and 19*a* or *b*, see FIG. V.

A preferred embodiment would have the lower one-half of sleeve section 18*a* or 18*b* permanently bonded, glued, or mechanically secured to the upper end of the respective section 19*a* or 19*b* so that when the peak bar is in set-up position, the combination of section 19*a* or 19*b* with sleeve 18*a* or 18*b* will create a receptacle element which readily accommodates the outer end of respective sections 17*a* and 17*b*. This type of construction will be discussed in greater detail hereinafter with respect to the leg sections. In the illustrated embodiment sections 17*a* and *b* and 19*a* and *b* are formed of tubular material such as fiberglass or the like.

Threaded through the respective interiors of peak section 16, tubular sections 17*a*, 17*b*, 19*a*, and 19*b*, and sleeve sections 18*a* and 18*b* is a continuous elastic shock cord 22 which is disposed therein under slight tension effectively insuring that all the individual sections of peak bars 20*a* and 20*b* will remain in engaged relationship with one another. Peak bars 20*a* and 20*b* may easily be disassembled by pulling longitudinally on the various sections against the shock cord tension until the various sections are out of telescoping relation whereupon the sections may be folded relative to one another when the tent is collapsed. The presence of elastic cord 22, it will be seen, creates a potential pivotal axis between each individual section joined thereby, which greatly simplifies the jack-knifing thereof into a small portable package.

Leg members 23, 24, 25, and 26 also include a plurality of individual interconnected sections, as is illustrated in FIGURES I, IV, V, and VII. Depending from the corresponding ends of front ferrule section 14 are legs 23 and 24 and in a like manner legs 25 and 26 depend from the corresponding ends of rear ferrule section 15.

In the particular embodiment shown, leg 23 includes coaxially aligned tubular sections 27*a*, 29*a*, and 31*a*. The ends of section 29*a* are arranged in abutting relationship with the lower end of section 27*a* and the upper end of section 31*a*, respectively, when the frame is in set-up position. Also arranged in an end to end abutting relationship are tubular sections 27*b*, 29*b*, and 31*b* of leg 24; tubular sections 34*a*, 36*a*, 37*a*, 38*a* and 40*a* of leg 25; and tubular sections 34*b*, 36*b*, 37*b*, 38*b* and 40*b* of leg 26. All of the aforenoted leg sections in this instance are fabricated from a flexible, resilient tubing material such as fiberglass or the like. It is noted (though not shown) that the sections comprising rear legs 25 and 26 are of a slightly greater cross sectional diameter than those of front legs 23 and 24 to compensate for the longer spans of the rear legs. It is also to be noted that the number of individual sections included in each leg is not critical and depends only upon the size and shape of the folded portable package desired as illustrated by FIGURE IV and upon the size of the shelter member supported by the frame.

The upper ends of sections 27*a* and 27*b* of legs 23 and 24 are in loose telescopic engagement within ends 14*b* and 14*c*, respectively, of V-shaped section 14, and the upper ends of sections 34*a* and 34*b* of legs 25 and 26 are in loose telescopic engagement within ends 15*b* and 15*c*, respectively, of V-shaped section 15 when the frame is in set-up position, as shown in FIGURES I, VII, and VIII.

Securing the individual abutting sections against angular or lateral movement with respect to one another while set-up are overlying sleeve or connecting sections 28*a* and 30*a* for leg 23; 28*b* and 30*b* for leg 24; 35*a*, 37*a*, 37*a*'' and 39*a* for leg 25; and 35*b*, 37*b*, 37*b*'', and 39*b* for leg 26. In this particular instance, approximately one-half of each sleeve section is permanently bonded, glued or otherwise affixed to the upper end of the next lower succeeding section so as to form a receptacle element within which the lower end of the next higher tubular section is telescopically fittable. Thus in FIGURE V, it will be seen that sleeve section 35*b* which is made of aluminum (as are all of the sleeve sections in this instance) is bonded with an epoxy glue for about one-half of its length (see 35*b*') to the longitudinal periphery of tubular section 36*b*. In FIGURE V, sleeve 35*b* is shown disengaged from section 34*b* as would be the case when shelter frame 10 is being collapsed. To place section 36*b* in set-up position with section 34*b*, the receptacle formed by sleeve 35*b* is simply slipped over the end of section 34*b* until the lower end thereof makes contact with the upper end of section 36*b*.

For reasons which will be hereinafter explained, the fit between sleeve 35*b* and section 34*b* (as well as the corresponding receptacle elements to be discussed) is preferably loose. Thus, as to leg 23, sleeve 28*a* is permanently bonded to section 29*a* and receives the end of section 27*a*; and sleeve 30*a* is permanently bonded to section 31*a* and receives the end of section 29*a*. For leg 24, sleeve 28*b* is permanently bonded to section 29*b* and receives the end of section 27*b*; and sleeve 30*b* is permanently bonded to section 31*a* and receives section 29*b*. For rear legs 25 and 26, sleeves 35*a* and 35*b* are permanently bonded, respectively to sections 36*a* and 36*b* and receive the ends of sections 34*a* and 34*b*; sleeves 37*a* and 37*b* are permanently bonded, respectively, to sections 37*a*' and 37*b*' and receive the ends of sections 36*a* and 36*b*; sleeves 37*a*'' and 37*b*'' in turn are permanently bonded to sections 38*a* and 38*b* and receive the ends of sections 37*a*' and 37*b*'; and sleeves 39*a* and 39*b* are likewise bonded, respectively, to sections 40*a* and 40*b* and receive the ends of sections 38*a* and 38*b*.

Subtending the bottom ends of legs 23, 24, 25 and 26 and telescopically and coaxially engaged therein with the aid of an epoxy glue or other means are feet 32 which are hollow along their longitudinal axes, see FIG. II. Each foot is of like configuration and includes an upper end 32*a* which has its longitudinal periphery in proximal engagement with the interior of the end section of the leg. End 32*a* may be affixed to the leg and section by an epoxy glue as aforenoted. Each foot 32, in this instance, is fabricated of aluminum while the leg end section in which it is accommodated is formed of fiberglass or the like. An annular shoulder 32*b* is provided in the projecting portion of the foot adjacent the end of the leg section and serves to limit the inward travel of foot 32 when a load is applied thereto. Normally, shoulder 32*b* will be in abutment with the end of the leg section. Another shoulder 32*c* is provided on the bottom tip of foot 32 which is spaced longitudinally from shoulder 32*b* by a narrow cylindrical portion 32*d*. The function of each foot will be described more fully hereinafter.

As in the case of peak bars 20*a* and 20*b*, previously described elastic shock cords are threaded through the interior portions of the legs and kept under slight tension to interconnect and continuously urge the individual sections thereof to remain in telescopic engagement with one another. In this construction, an elastic cord 33 is threaded through the feet and individual sections of legs 23 and 24 and V-shaped section 14 of junction unit 13.

Similarly, as shown in FIGURE V, an elastic cord 41 is threaded through the feet 32 and individual sections of legs 25 and 26 and through V-shaped section 15 of junction unit 13.

To keep the cord under proper tension, knots 33*a* are appropriately disposed on the ends of cord 33 adjacent the bottom of each foot which are sized to prevent passage therethrough and in a like manner similar knots, not shown, are provided at the ends of cord 41. Of course, it will be understood that other means such as metal clips or clamps may be used to functionally accomplish the same result as the knots.

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