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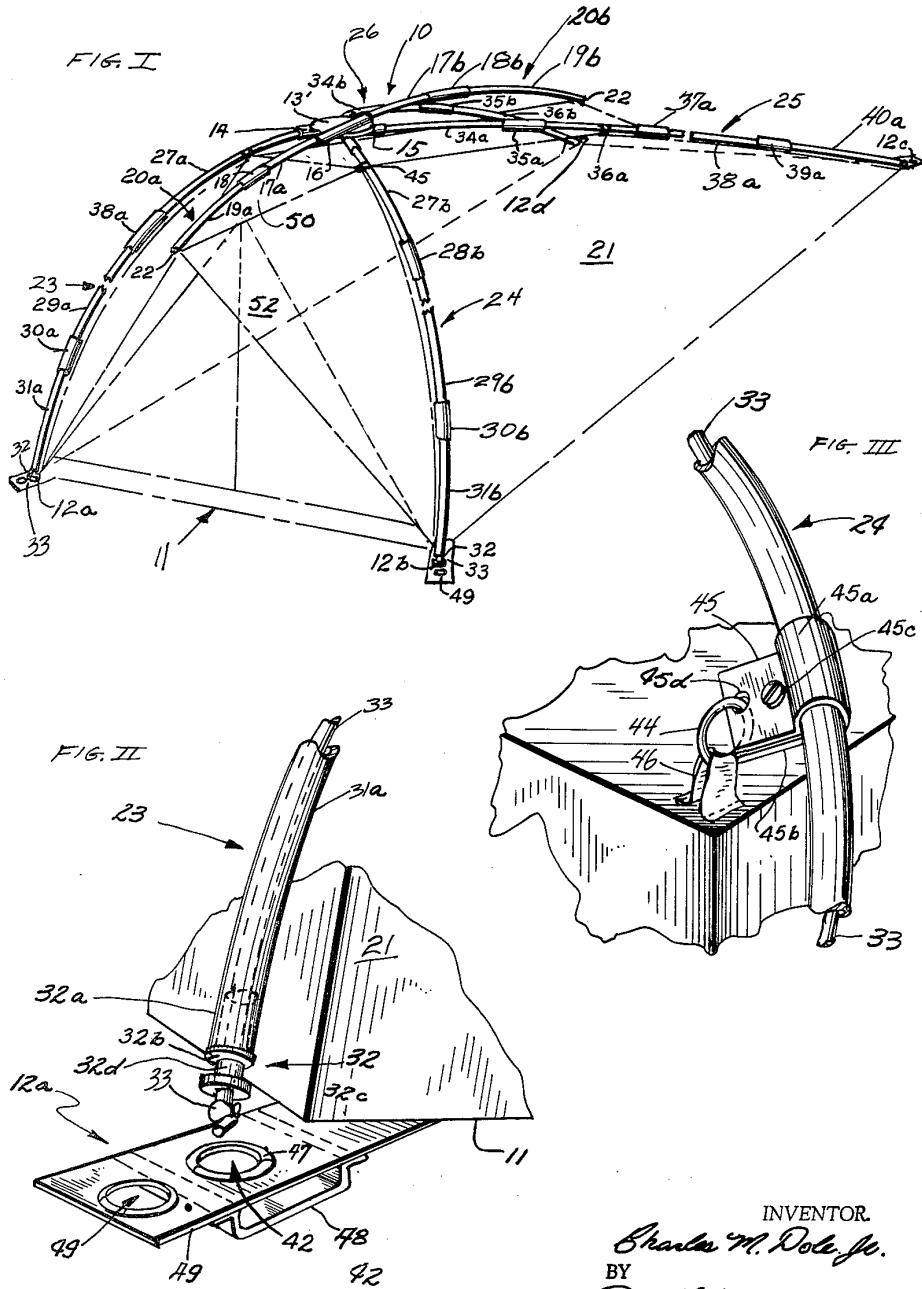
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COLLAPSIBLE SHELTER CONSTRUCTION

Filed Sept. 12, 1963

3 Sheets-Sheet 1



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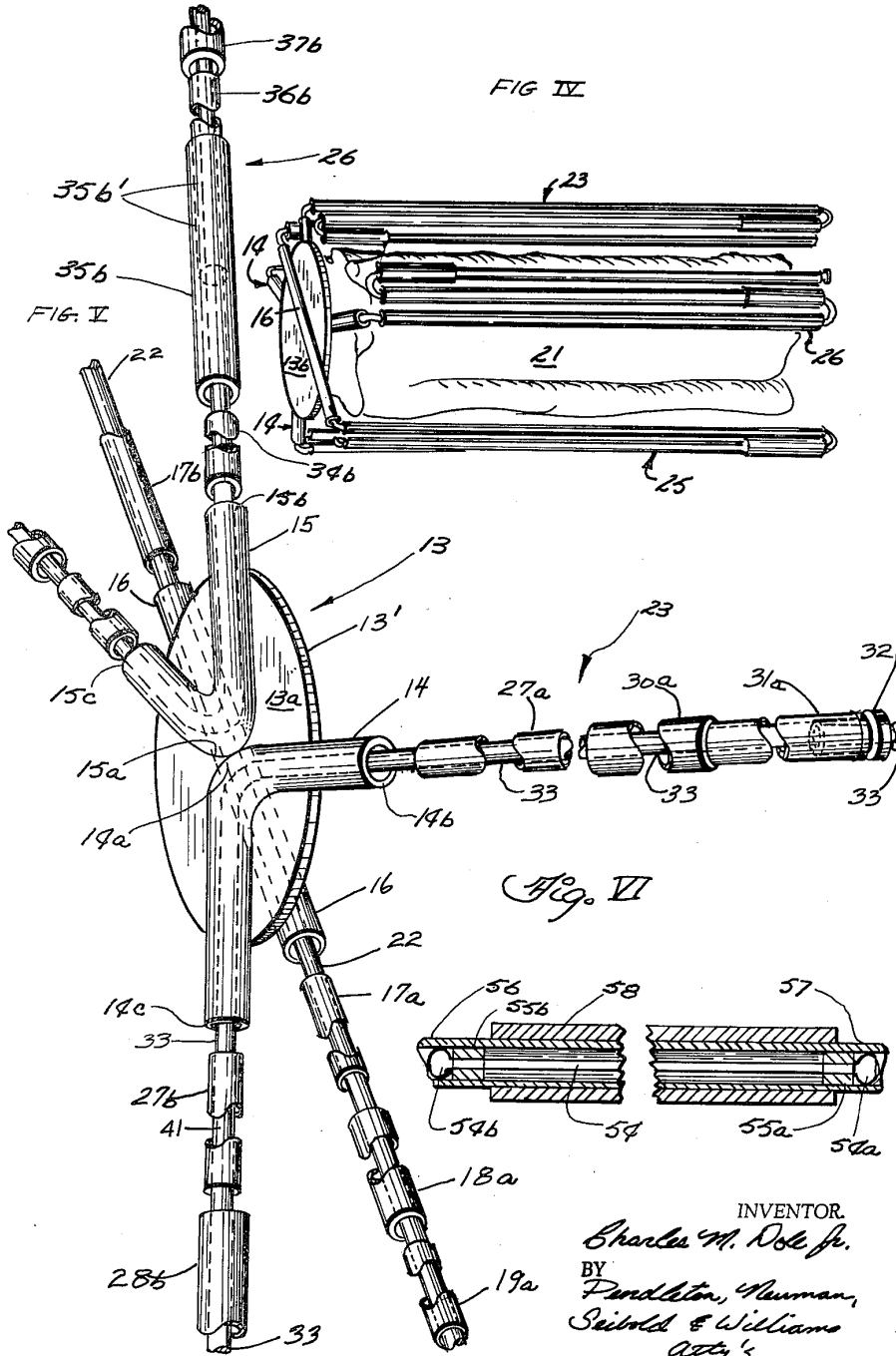
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COLLAPSIBLE SHELTER CONSTRUCTION

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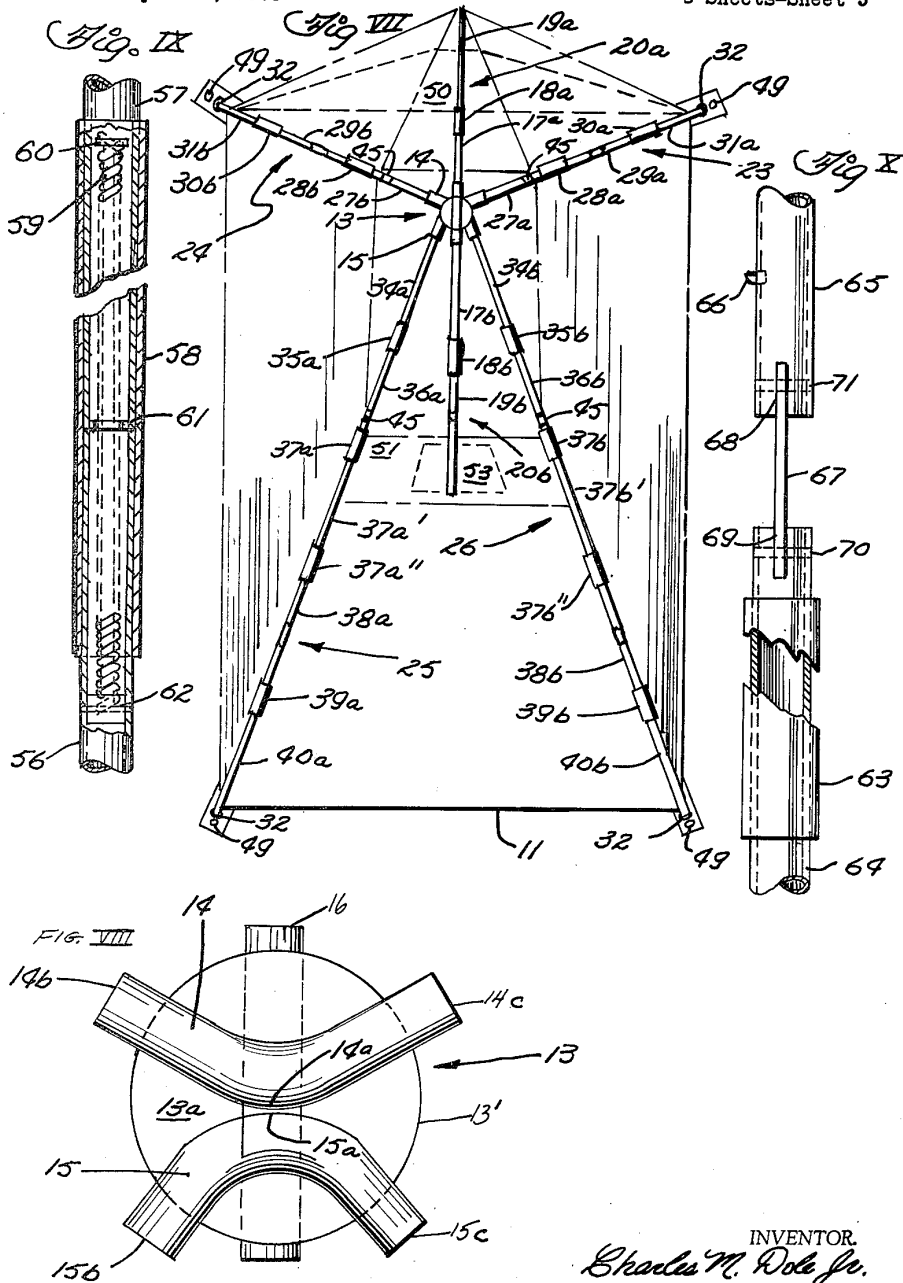
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COLLAPSIBLE SHELTER CONSTRUCTION

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3 Sheets-Sheet 3



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3,223,098
COLLAPSIBLE SHELTER CONSTRUCTION
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 Filed Sept. 12, 1963, Ser. No. 308,522
 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 unwieldy 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 aforementioned 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

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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:

5 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.

10 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.

15 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 12a, 12b, 12c and 12d 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 20a and 20b, 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 13a 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 14a and 15a are arranged adjacent each other, the bisectors of each lying in substantially common planes.

Mounted on and affixed to the top side 13b 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 20a and b, each of which includes a tubular section 17a or 17b 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 17a or b is a second tubular section 19a or b which is of substantially like dimension to that of section 17a or b. To retain the sections 17a-19a or 17b-19b in proper relation with respect to one another when the frame is set up, a sleeve section 18a or b is provided. The ends of section 18a or b are adapted to receive the adjacent ends of sections 17a or b and 19a or b, see FIG. V.

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

Threaded through the respective interiors of peak section 16, tubular sections 17a, 17b, 19a, and 19b, and sleeve sections 18a and 18b is a continuous elastic shock cord 22 which is disposed therein under slight tension effectively insuring that all the individual sections of peak bars 20a and 20b will remain in engaged relationship with one another. Peak bars 20a and 20b 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 27a, 29a, and 31a. The ends of section 29a are arranged in abutting relationship with the lower end of section 27a and the upper end of section 31a, respectively, when the frame is in set-up position. Also arranged in an end to end abutting relationship are tubular sections 27b, 29b, and 31b of leg 24; tubular sections 34a, 36a, 37a, 38a and 40a of leg 25; and tubular sections 34b, 36b, 37b, 38b and 40b of leg 26. All of the aforementioned 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 27a and 27b of legs 23 and 24 are in loose telescopic engagement within ends 14b and 14c, respectively, of V-shaped section 14, and the upper ends of sections 34a and 34b of legs 25 and 26 are in loose telescopic engagement within ends 15b and 15c, 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 28a and 30a for leg 23; 28b and 30b for leg 24; 35a, 37a, 37a' and 39a for leg 25; and 35b, 37b, 37b'', and 39b 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 35b 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 35b') to the longitudinal periphery of tubular section 36b. In FIGURE V, sleeve 35b is shown disengaged from section 34b as would be the case when shelter frame 10 is being collapsed. To place section 36b in set-up position with section 34b, the receptacle formed by sleeve 35b is simply slipped over the end of section 34b until the lower end thereof makes contact with the upper end of section 36b.

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

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 32a which has its longitudinal periphery in proximal engagement with the interior of the end section of the leg. End 32a may be affixed to the leg and section by an epoxy glue as aforesaid. 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 32b 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 32b will be in abutment with the end of the leg section. Another shoulder 32c is provided on the bottom tip of foot 32 which is spaced longitudinally from shoulder 32b by a narrow cylindrical portion 32d. The function of each foot will be described more fully hereinafter.

As in the case of peak bars 20a and 20b, 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 33a 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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