

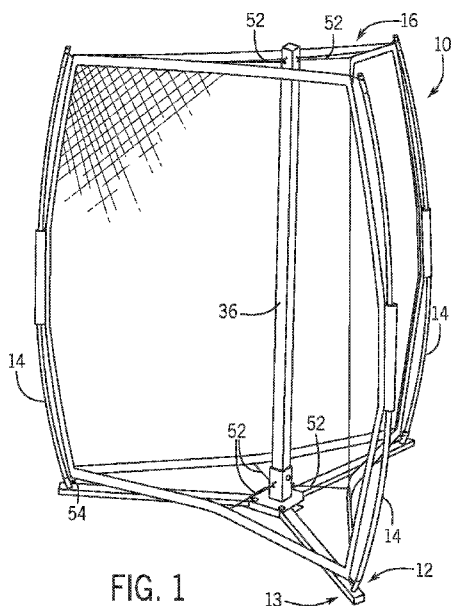


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(54) Title: FOLDABLE FIELDING NET



(57) Abstract: A net assembly includes a base having hub and at least three extension arms, wherein the extension arms extend from the base hub to form a polygon. At least one flexible support pole is removably coupled to each of the extension arms of the base, and a net is configured to receive each of the flexible support poles. The net comprises a plurality of panels which define a polygonal cross-section. The net bends each of the flexible support poles such that the each of the poles is in a flexed state and wherein in the flexed state, each of the flexible support poles is adapted to exert an outward force onto the net, thereby exposing each of the plurality of panels of the net.

WO 2017/117502 A1

FOLDABLE FIELDING NET

Cross Reference to Related Application

[0001] This application is a non-provisional application claiming priority from U.S. Provisional Application Serial No. 62/273,705, filed December 31, 2015, entitled “Systems and Methods for Improved Sporting Equipment” and incorporated herein by reference in its entirety.

Field of the Disclosure

[0002] The present description relates generally to sporting equipment and more particularly to a foldable fielding net.

Background of Related Art

[0003] Sporting equipment, including equipment directed towards baseball and soccer is well known. More particularly, nets have been developed. For instance, U.S. Patent No. 5,690,339 is directed towards a collapsible sports goal apparatus including a goal base member and a goal net attached to the goal base member. Two flexible, resilient poles extend between the goal base member and the top of the goal net. The poles are bent and exert continuous opposed forces on the goal base member and the goal net top to continuously bias the goal net top away from the goal base member and maintain the goal net in stretched condition and disposed upwardly from the goal base member.

[0004] U.S. Patent No. 5,816,956, meanwhile, describes a net support structure which provides for assembly and disassembly for enabling games such as tennis and volleyball to be played as well as providing a rebound net or safety net for use in other sporting games or for the practice of sporting games. The net support structure includes a plurality of modules which are joined together by an elastic cord or springs and which when connected together tension the modules to form a net support structure and which can be collapsed by disconnecting the modules and allowing the modules to be folded whilst at the same time keeping the modules joined by the tensioning means. Elbows are provided which form corners and which are permanently or releasably joined by the cord. If releasably joined the elbows can be repositioned to alter the configuration of the net support structure.

[0005] U.S. Patent No. 6,210,288 describes a golf practice net assembly which allows a user to practice tee-shots in a limited and/or indoor area. The net assembly has a U-shaped base pipe unit laid on a support surface. A main support pipe is mounted to an end of each

side arm of the base pipe unit. The support pipe extends upwardly and is inclined outwardly relative to the side arm. First and second tension pipes are coupled to each other using a joint, thus forming a tension pipe unit with a holding pin being provided at an outside end of the tension pipe unit for holding a net. The tension pipe unit is mounted to the support pipe at the lower end thereof

[0006] Finally, U.S. Patent No. 9,283,455, describes a net apparatus arranged to provide a net structure to capture or catch a projectile. The net apparatus comprises a base structure including at least one support portion, at least one base extension, and a hinge, wherein the at least one support portion is coupled to the at least one base extension and the hinge. At least one rod is removably coupled to the base structure and received by a net, wherein the net is adapted to exert a force on the at least one rod causing the at least one rod to exert a force onto said hinge in order to lock the at least one support portion

[0007] While the above references netting equipment is generally sufficient for its intended purposes, there is a demonstrated need and desire for improved equipment and methods of using the same.

Brief Description of the Drawings

[0008] FIG. 1 is an illustration of an example foldable fielding net constructed in accordance with the teachings of the present disclosure.

[0009] FIG. 2 is a top plan view of the example fielding net of FIG. 1.

[0010] FIG. 3 is an illustration of an example fielding net frame for use with the example fielding net of FIG. 1.

[0011] FIGS. 4A-4D are illustrations of various components of the base of the example fielding net frame of FIG. 3.

[0012] FIG. 5 is an illustration of an example net for use with the example fielding net frame of FIG. 1.

[0013] FIG. 6 is an illustration of the example foldable fielding net constructed in accordance with the teaching of the present disclosure and including a fielding net frame without a center frame pole.

[0014] FIG. 7 is an illustration of the base of the example fielding net of FIG. 6 in a collapsed or folded position.

[0015] FIG. 8 is an illustration of the base of the example fielding net of FIG. 6 in a partially unfolded position.

[0016] FIG. 9 is an illustration of the base of the example fielding net of FIG. 6 in a fully unfolded position.

[0017] FIG. 10A is an illustration of a net retaining channel formed on an upper end of an example flexible support pole.

[0018] FIG. 10B is an illustration of the net retaining channel of FIG. 10A showing an end of a net coupled thereto.

[0019] FIG. 11 is an illustration of another example net attachment formed at a lower end of an example flexible support pole.

Detailed Description

[0020] The following description of example methods and apparatus is not intended to limit the scope of the description to the precise form or forms detailed herein. Instead the following description is intended to be illustrative so that others may follow its teachings.

[0021] Examples of a fielding net/target are illustrated in the figures and described herein. The example nets are designed to give players a target during fielding drills, batting practice, or other activity. In one instance, the example nets can receive throws, hits, etc. from any direction and capture and/or return the ball as desired, depending upon the netting and/or how tightly the netting is held. As illustrated herein, the net/target assembly can break down for easier transport and storage.

[0022] More precisely, FIG. 1 illustrates one example of a net assembly 10. The net assembly 10 is constructed and adapted such that the net assembly 10 may be deployed in any suitable environment, such as, for example, an indoor or outdoor location. In the examples disclosed herein, the example net assembly 10 is particularly well suited for use as a target for various sporting activities such as baseball, softball, football, soccer, volleyball, tennis, or the like. It will be appreciated by one of ordinary skill in the art, however that the net assembly 10 may be used in any suitable activity.

[0023] The example net assembly 10 generally comprises a base 12, a plurality of flexible rods 14 removably coupled to the base 12, and a net 16 adapted to be supported by the rods 14. The rods 14 are positioned and configured to exert a force on the net 16 to fully deploy the net 16 when fully assembled. In addition, the example net assembly 10, including the base 12, rods 14, and net 16, when fully assembled and deployed, are adapted to withstand the force of a suitable ball or projectile so as to capture the ball while keeping the net apparatus 10 in a generally upright standing position. In some examples, the net assembly 10, when fully assembled and deployed, is adapted to tension at least a portion of the net 16

such that a striking ball or projectile is rebounded, or returned from the net 16. The example net assembly 10 defines a support structure that deploys the net 16 into a configuration having a polygon shaped perimeter. More specifically, in the example shown in FIG. 1, the net assembly 10 includes three rods 14 located at three vertices of the base 12, which in this instance deploys the net 16 into an equilateral triangle.

[0024] As best illustrated in FIGS. 1-3, the example base 12 comprises a plurality of base extension arms 13 coupled to a central base hub 20. In the example illustrated in this disclosure, the base 12 includes three extension arms 13a, 13b, 13c, but it will be appreciated that in other examples, there may be more than three extension arms 13. As shown in FIGS. 4A and 4B, two of the extension rods 13b and 13c are pivotally coupled to the base hub 20, while the third extension arm 13a is fixed to the base hub 20 by any suitable means, including for instance, welding. In this example, the pivotally attached extension arms 13b, 13c are pivotal through an arc of approximately 120°.

[0025] With the arrangement of the present example, the base 12 is foldable into a compact configuration (see FIG. 7), wherein each of the extension arms 13a, 13b, 13c are moved into a parallel arrangement. In the unfolded position, the extension arms 13b, 13c are pivoted about their respective pivots 22b, 22c which may be vertically oriented pivot pins or other suitable pivot device, such that the arms 13a, 13b, 13c extend outwardly from the hub 20. As will be understood, the pivotally attached extension arms 13b, 13c may be freely rotatable, or may be lockable into place (e.g, the folded and/or unfolded positions) by respective locking pins/buttons 90 (see FIG. 9).

[0026] In the unfolded position, the arms 13a, 13b, 13c extend from the hub 20 such that an imaginary line (L) extending between adjacent distal ends of the arms 13a, 13b, 13c would form a polygon, which in this illustrated example would be a triangle. It will be appreciated by one of ordinary skill in the art, however, that with a different number of extension arms and/or different arrangements of the extension arms, the distal ends of the arms may form different polygons, e.g., four arms may form a square, five arms a pentagon, etc. This hub and arm arrangement allows the base 12 and more particularly the extension arms 13a, 13b, 13c to not only support the flexible support poles 14 and thus the net 16 as will be described herein below, but also provides additional structural support to stabilize the net assembly 10 in an upright position.

[0027] As noted above, each of the extension arms 13a, 13b, 13c has a distal end, 24a, 24b, 24c, respectively. Each of the distal ends 24a, 24b, 24c comprises a coupling device, such as a shaft 30 extending vertically and configured to receive one of the flexible support poles 14.

Each of the shafts 30 may be rigid and/or flexible as desired. Additionally, each of the shafts 30 may be offset slightly from vertical and extending away from the base 20 as best shown in FIG. 4D. Each of the example shafts 30 is configured to accept and releasably mount one of the flexible support poles 14 therein. It will be understood that due to the slight vertical offset in the shaft 30, each of the retained poles 14 will extend slightly offset from vertical as well and generally outward from the center of the base 20. In this example, each of the shafts 30 includes a hook 32 configured to retain a bottom portion of the net 16 as will be described.

[0028] While in the illustrated example, each respective shaft 30 is positioned at the distal ends 24a, 24b, 24c of the extension arms 13a, 13b, 13c, respectively, any or all of the shafts 30 may be located at various other locations on the extension arms 13a, 13b, 13c as desired. For instance, in some examples, it may be beneficial to have at least one extension arm 13 longer than the net 16 in order to provide additional stability to the net assembly 10. In still other examples (not shown) the net assembly 10 may include additional flexible support poles 14 located at the same and/or various locations along each extension arm 13 to provide additional support for the net 16.

[0029] As noted above, at least one rod 14 is configured to be retained by a corresponding shaft 30. In this example, each rod 14 comprises a plurality of separable parts that may be releasably coupled together to form one elongated pole. For instance, as can be seen in FIG. 3, the example poles 14 each include two portions, a lower portion 14a and an upper portion 14b. The example poles are flexible in that they can be flexed beyond a straight line (e.g., a bowed configuration) without breaking and/or damaging the pole 14. These types of poles may oftentimes be commonly known as tent poles. The example poles may comprise fewer and/or additional portions (e.g., three portions) and may be uncoupled or coupled together with any suitable arrangement, including for instance a shock cord, string, chain, or other suitable arrangement.

[0030] When inserted into the shaft 30, the shaft 30 maintains a stable structural connection between the shaft 30 and the at least one pole 14 and prevents the pole 14 from being removed from the shaft 30 when the net 16 is assembled over the pole 14 without significant effort. The poles 14 may be constructed of many different materials known in the art, such as for instance, fiberglass or carbon fiber such that, as previously noted, the poles 14 are flexible, elastic, capable of returning to an initial form or state after deformation, and able to withstand the impact forces applied by sports-related balls and/or other projectiles that can be captured or caught by the net assembly 10, or thrown, kicked, and/or hit towards the net assembly 10.

[0031] The illustrated example base hub 20 further comprises a centralized shaft 34 configured to releasably retain an optional vertically extending central pole 36. The example pole 36 is comprised of the same material as the base 12, such as for instance a metallic steel having a generally square cross section. It will be appreciated by one of ordinary skill in the art that the composition and/or cross section of the pole 36 may vary as desired and may vary along the length of the pole 36 as desired. As best seen in FIG. 4C, the centralized shaft 34 may include at least one hook 38 mounted on the perimeter of the shaft 34 for assisting in retaining a bottom portion of the net 16 as will be described. Similarly, as best seen in FIG. 3, an upper portion of the pole 36 may include at least one hook 39 mounted on the perimeter of the pole 36 for assisting in retaining an upper portion of the net 16. In this example, the optional pole 36 is rigid, but in other examples, the pole 36 may be at least somewhat flexible. Furthermore, the pole 36 may be retained within the shaft 34 by a respective locking pin/button 40, cotter pin, or other suitable retainer (see FIG. 4C).

[0032] As noted above, each of the poles 14, when received by the respective shaft 30, is configured to flare outwards in a direction away from the base 12 and the centralized pole 36 (if present). In this instance, the poles are in a non-flexed state and are typically substantially straight. As best viewed in FIGS. 2 and 5, the net 16 is a multi-paneled, vertically extending net having a polygonal cross-section that corresponds to the polygonal perimeter arrangement of the base 12. In this example, the net 16 comprises a triangular cross section to correspond to the shape of the three extension arms 13 of the base 12 when the arms 13 are in the unfolded position. The net 16 comprises at least one sleeve 50 arranged at the seem of each of the panels of the net 16, wherein each sleeve is configured to receive a corresponding pole 14 and to exert a force on the retained pole 14, bending the pole 14 into an inwardly flexed state (see FIG. 1). In other words, inserting the poles 14 into the sleeves 50 requires that the pole 14 be bent from the relaxed, flared state into an inwardly flexed state to allow the sleeve 50 to receive the corresponding pole 14.

[0033] Because the poles 14 are each non-deformably flexible, when each of the poles 14 are received by the respective shaft 30 and sleeves of the net 50, each of the poles 14 are bent inward towards the base hub 20 and the centralized pole 36 if present, and into the flexed state. Moreover, removal of the net 16 allows the poles 14 to return to their original, non-flexed, form. Repeated use of the net assembly 10 does not result in any appreciable permanent bending in the poles 14 and therefore, the net 16 can be repeatably utilized without limit.

[0034] When installed over the poles 14, the net 16 imparts an inward pulling force on each of the poles 14 which causes each of the poles to be flexed in a direction towards the base hub 20, which in turn causes the net 16 to be pulled outward, thereby pulling the net 16 taut and exposing the full shape of the perimeter of the net 16. For instance, the example net 16, when fully assembled, exposed a first face 16a, a second face 16b, and a third face 16c. The net 16 may be constructed such that the net includes a slack portion to catch and/or otherwise retain a ball or other projectile contacting one of the faces 16a, 16b, 16c. Alternatively, the net 16 may be constructed such that at least one of the faces 16a, 16b, 16c is sufficiently taut to rebound a ball or other projectile contacting one of the faces 16a, 16b, 16c.

[0035] The net 16 can be a mesh surface or any typical net known in the art. Each of the sleeves 50 of the example net 16 is in the form of a single length sleeve that receives a portion of the poles 14. It will be appreciated, however, that in other examples, the net 16 may comprise a plurality of sleeves 50, or may comprise any other suitable device to capture and/or couple the net 16 to the pole 14. For instance, the net 16 may include a plurality of hooks that clip over the pole 14. Furthermore, in the illustrated example, the net 16 includes a plurality of ropes 52 that are releasably coupleable to the hooks 38 and 39. In this example, the ropes 52 are a nylon cord, but it will be appreciated that the composition of the ropes 52 may vary as desired, including for instance a stretchable elastic material ropes. As illustrated, the ropes 52 may be mounted to the upper portion of the net 16 to couple the top portion of the net 16 to the hooks 39 and additional ropes 52 may be mounted to the lower portion of the net 16 to couple the lower portion of the net 16 to the hooks 38.

[0036] Still further, in the example illustrated, the lower portion of the net 16 includes at least one loop 54 to couple the lower portion of the net 16 to the hooks 32 of the sleeves 30. Yet further, in the illustrated example, each of the poles 14 includes an endcap 100 (see FIG. 10A) that includes a circumferential channel 102 that accepts a loop 104 formed attached to the upper portion of the net 16 (see FIG. 10B) to further assist the pole 14 in retaining the full length of the net 16.

[0037] As previously noted, the net assembly 10 according to the teachings of the present disclosure is designed to withstand the force of a ball or other projectile so as to catch, capture, and/or rebound the ball, while maintaining an upright standing position. Turning now to FIGS. 7-9, the base 12 may optionally include at least one attachment device 70, such as an attachment cord 72 having a ring 74. The attachment cord 72 allows for the connection of a weight, stake or similar device to provide additional support for the net assembly 10.

[0038] In the example net assembly 10 illustrated in FIG. 6, it will be seen that the base 12, and more precisely the base hub 20 does not show the optional centralized pole 36. Rather, in this example, the assembly 10 is sufficiently supported in the desired configuration without requirement of the centralized pole 36. Furthermore, in this example, the net 16 does not include ropes 52. Rather, the illustrated net 16 includes an additional sleeve in the form of a loop 63 arranged on the lower seam of each of the panels of the net 16 and adapted to be retained by the pole 14. The lower portion of the net further comprises an extended panel 65 that may assist in retaining any captured balls in the net 16.

[0039] It will be appreciated that while the above disclosure is directed toward various sporting equipment types, i.e., soccer, baseball, etc., the devices and/or concepts presented herein may be equally applied to various other sporting devices, sports, equipment, etc., as well known to one of ordinary skill in the art. For example, the systems and methods may be utilized in various other sports such as hockey, football, lacrosse, tennis, baseball, soccer, baseball, basketball, cricket, rugby, etc., as desired.

[0040] Still further, although certain example methods and apparatus have been described herein, the scope of coverage of this patent is not limited thereto. On the contrary, this patent covers all methods, apparatus, and articles of manufacture fairly falling within the scope of the appended claims either literally or under the doctrine of equivalents.

We claim:

1. A net assembly, comprising:
 - a base comprising a base hub and at least three extension arms, wherein the extension arms extend from the base hub such that a line extending between adjacent distal ends of the arms would form a polygon;
 - at least one flexible support pole removably coupled to each of the extension arms of the base; and
 - a net configured to receive each of the flexible support poles, the net comprising a plurality of panels which define a polygonal cross-section,
 - wherein the net is adapted to bend each of the flexible support poles such that each of the flexible support poles is in a flexed state and wherein in the flexed state, each of the flexible support poles is adapted to exert an outward force onto the net, thereby supporting the net therebetween and exposing each of the plurality of panels of the net between the flexible support poles.
2. The net assembly as recited in claim 1, wherein the base comprises three extension arms forming a triangle.
3. The net assembly as recited in claim 2, wherein the three extension arms form an equilateral triangle.
4. The net assembly as recited in claim 2, wherein at least two of the extension arms are pivotally coupled to the base hub.
5. The net assembly as recited in claim 1, wherein each of the extension arms further comprises at least one shaft, wherein each of the at least one shafts is configured to receive one of the plurality of flexible support poles.
6. The net assembly as recited in claim 1, wherein the base hub further comprises a vertically extending centralized pole.
7. The net assembly as recited in claim 6, wherein an upper portion of the net is coupled to an upper portion of the vertically extending centralized pole.

8. The net assembly as recited in claim 1, wherein at least one of the plurality of panels is held taut by the flexible support poles.

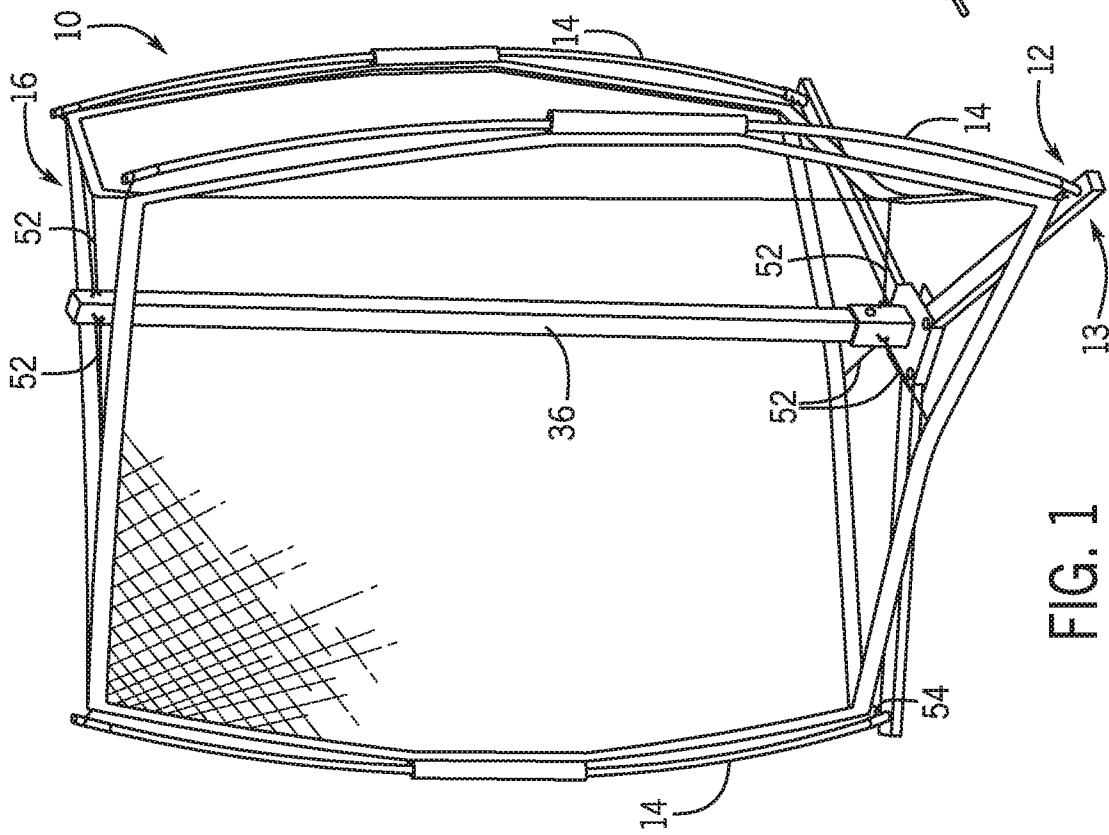


FIG. 1

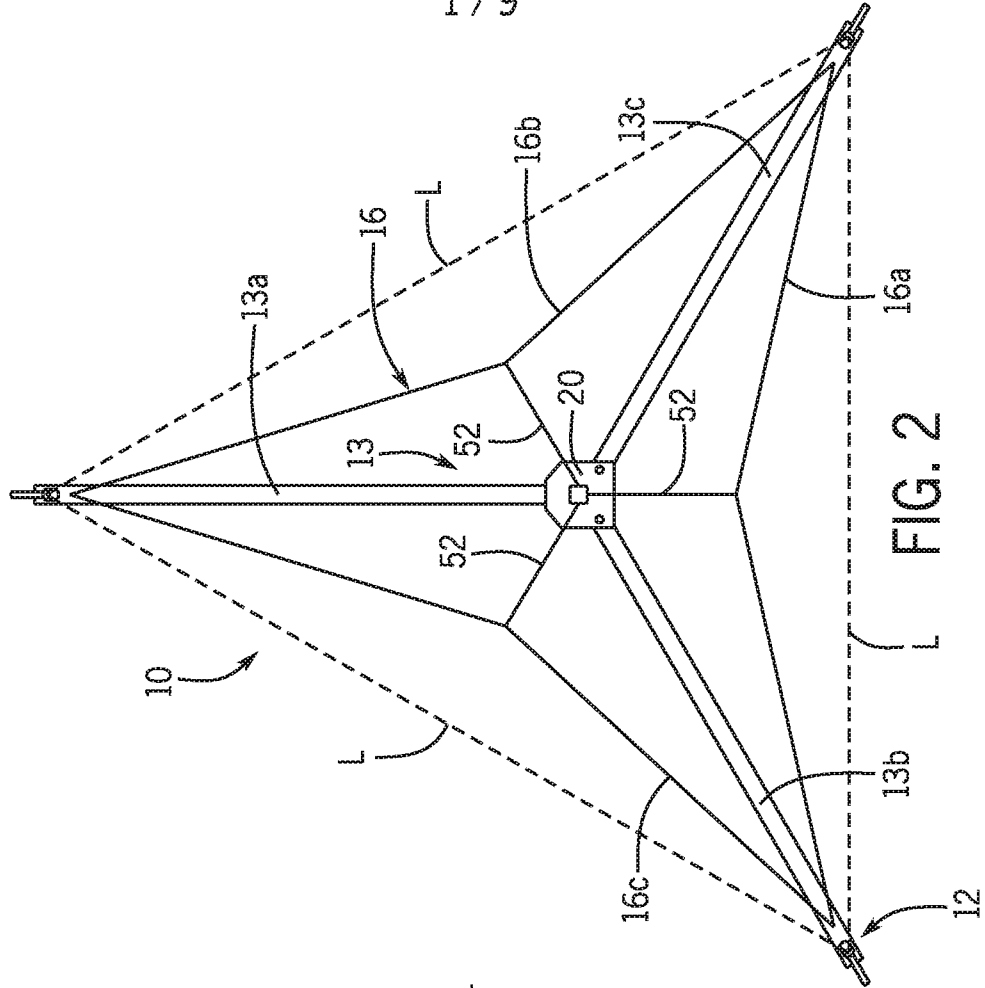


FIG. 2

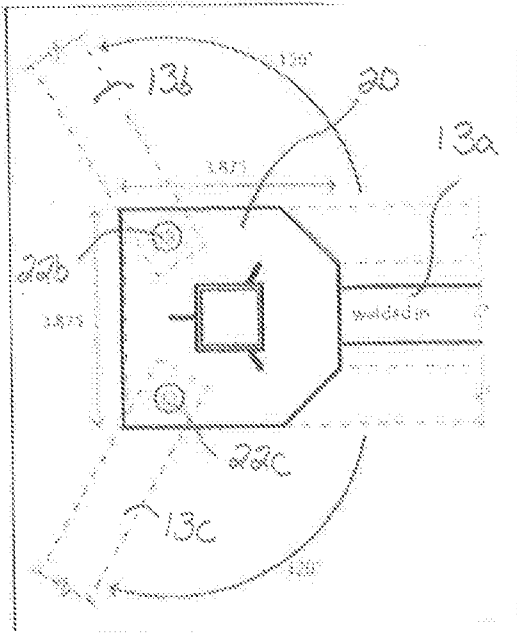


FIG. 4A

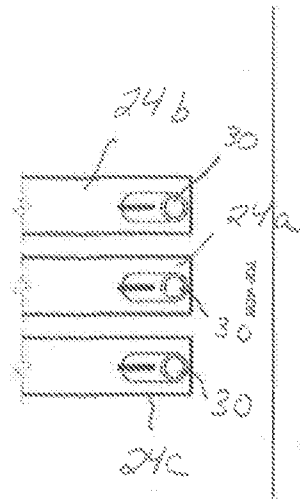


FIG. 4B

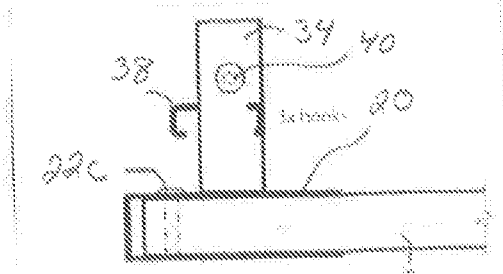
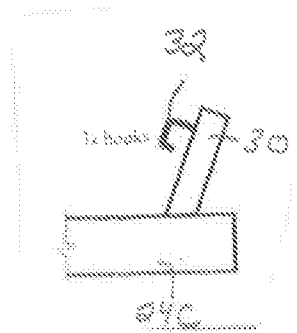


FIG. 4C



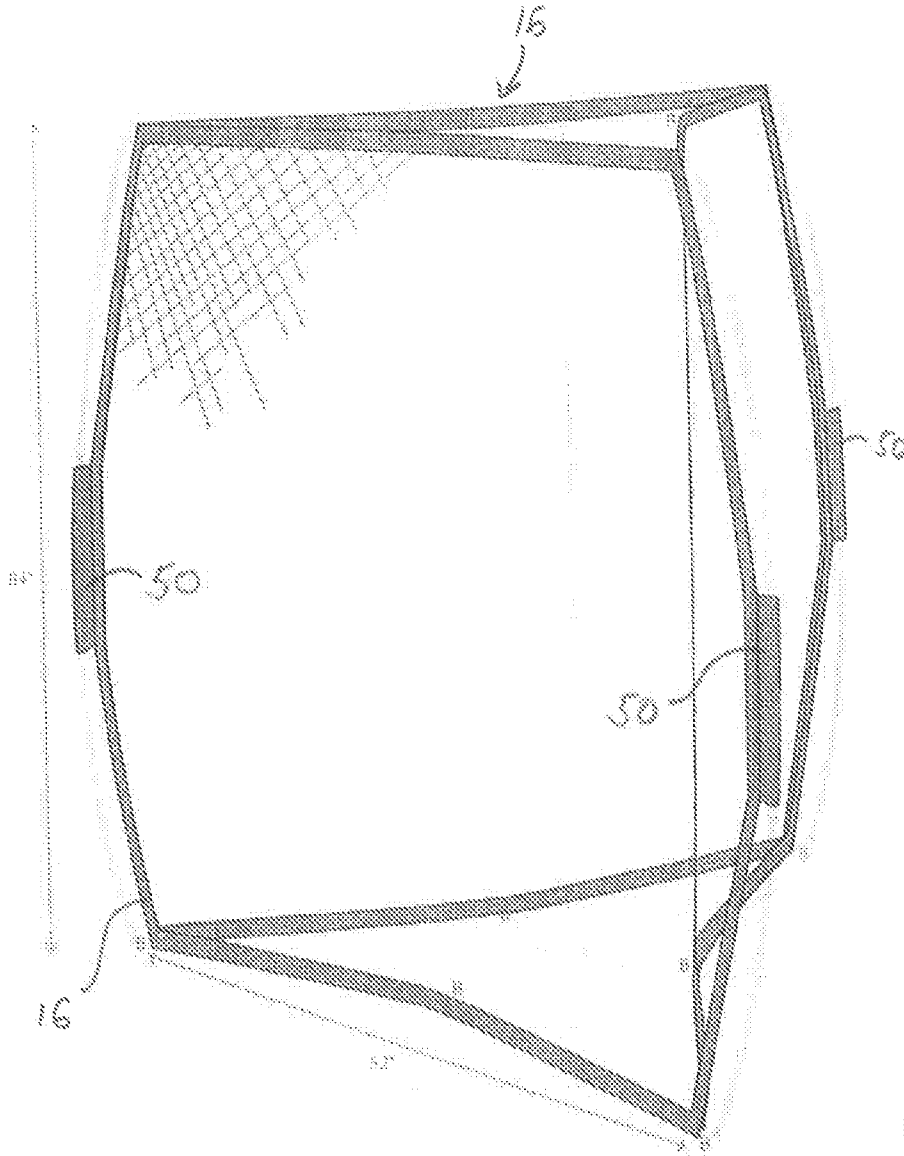


FIG. 5

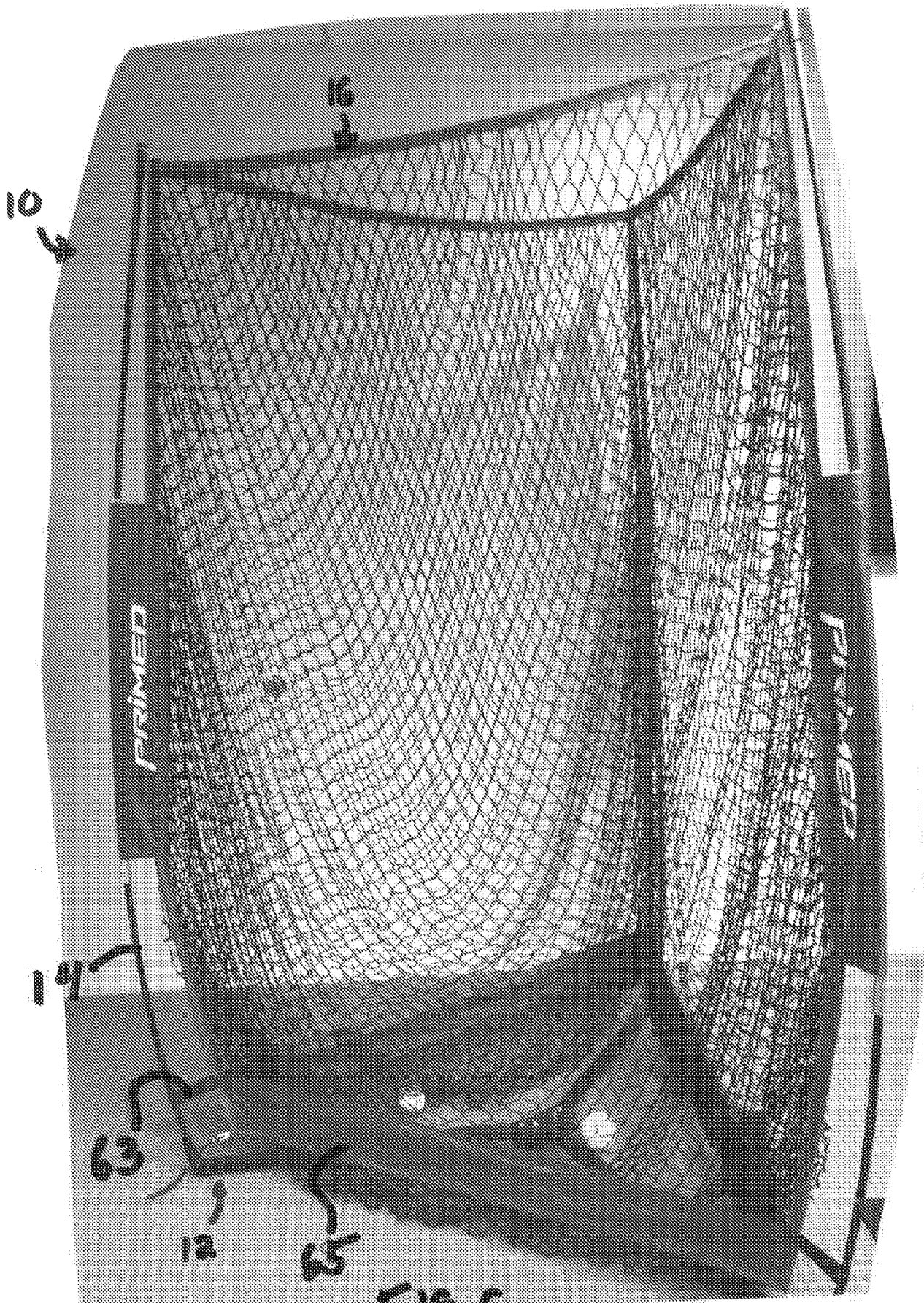


FIG. 6

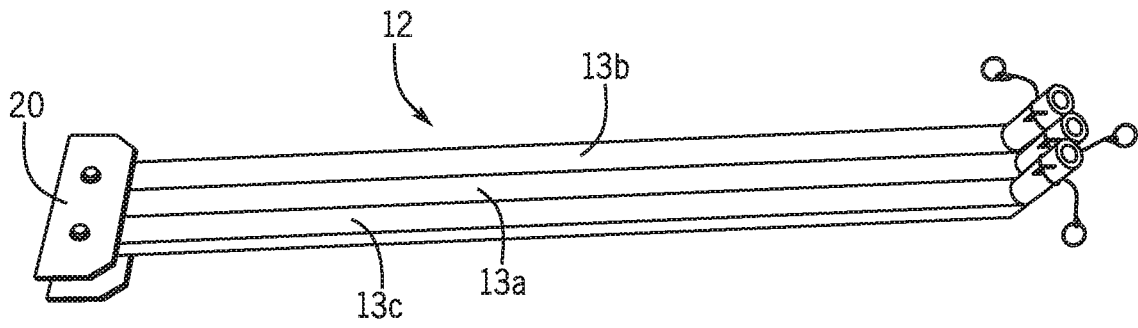


FIG. 7

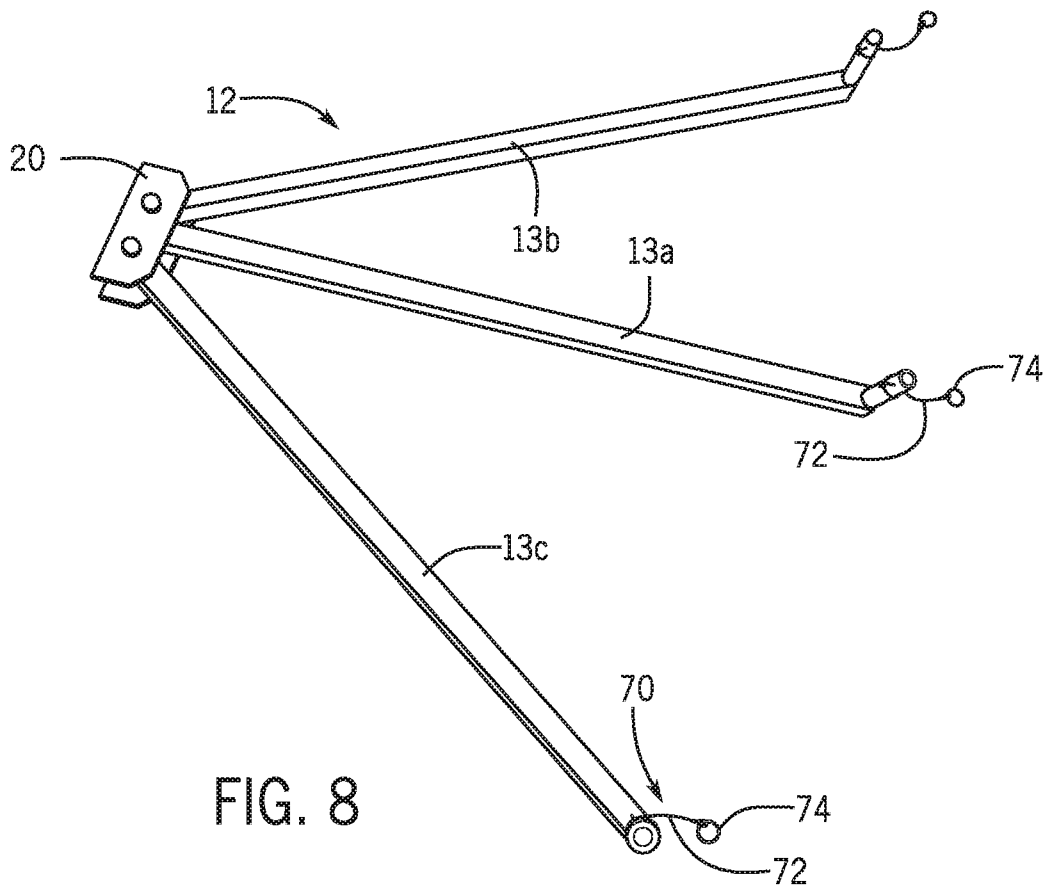


FIG. 8

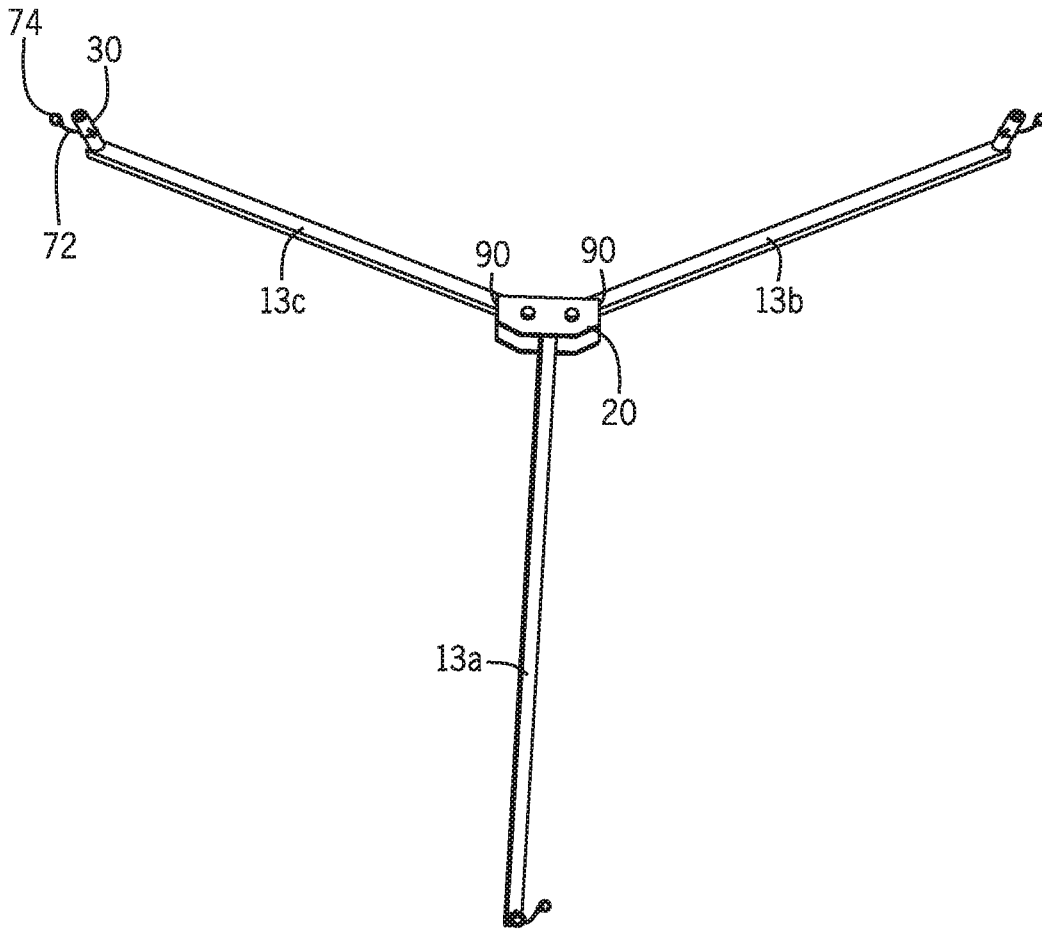


FIG. 9

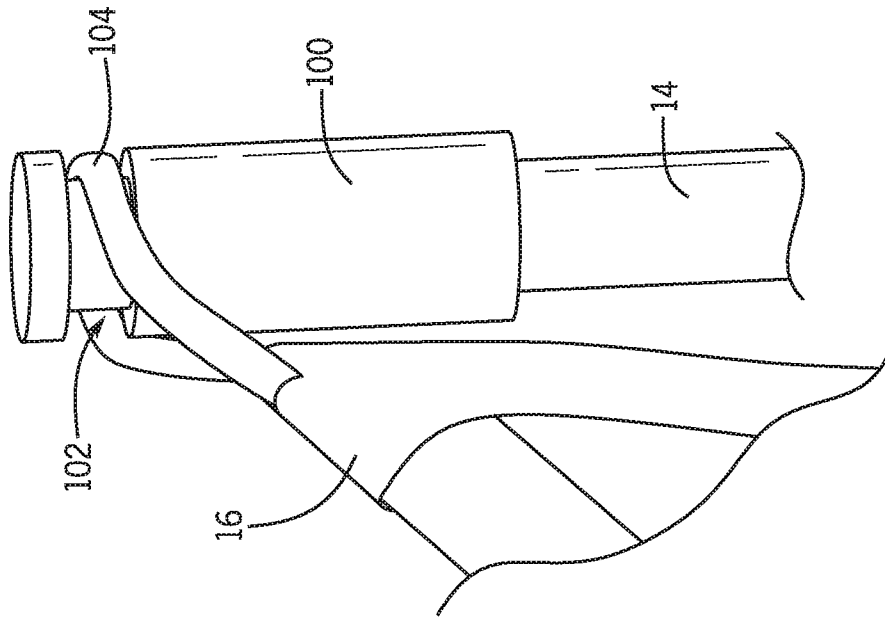


FIG. 10B

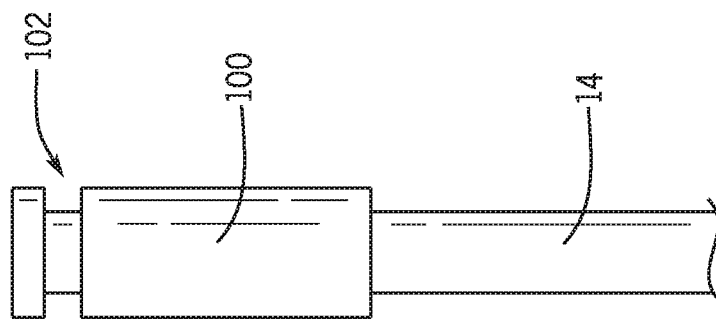


FIG. 10A

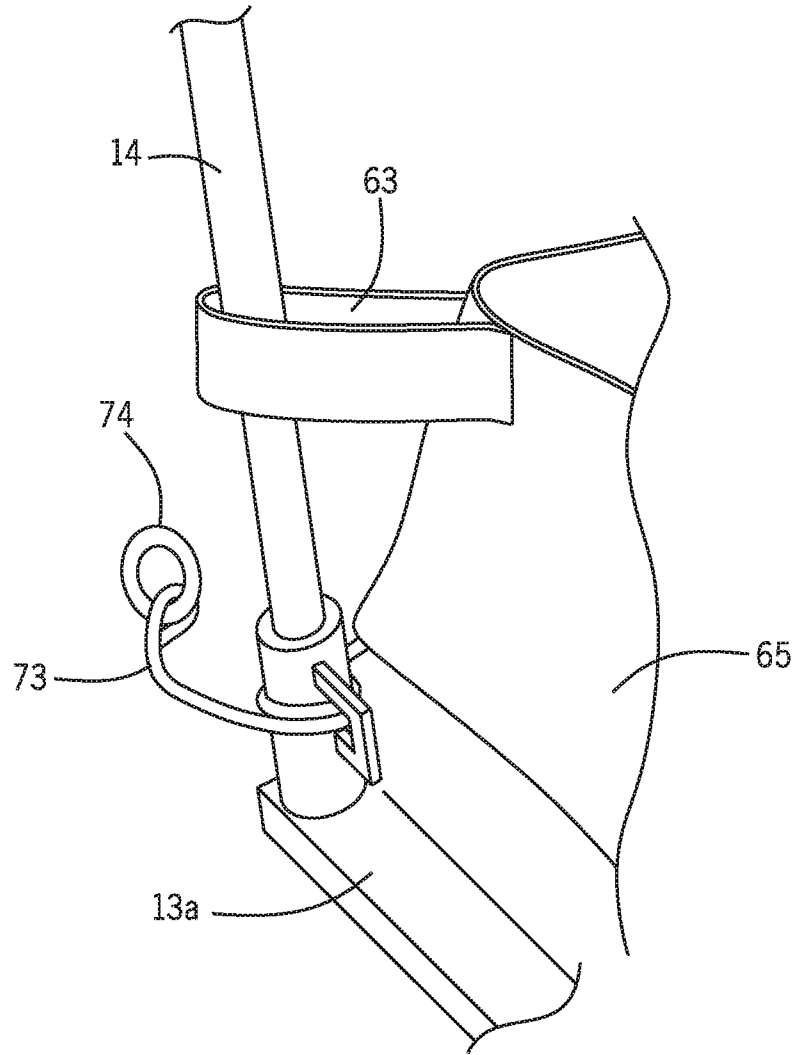


FIG. 11

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US16/69429

A. CLASSIFICATION OF SUBJECT MATTER
 IPC - A63B69/00, A63B63/00 (2017.01)
 CPC - A63B69/0097, A63B63/00, A63B71/022, A63B69/0002

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

See Search History document

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

See Search History document

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

See Search History document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005/0077014 A1 (MARK, J) 14 April 2005; paragraphs [0025]-[0029] and [0036]-[0044]	1-4, 6-8
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Y		5
Y	US 2006/0073919 A1 (MORROW, W) 06 April 2006; paragraphs [0041]-[0047]	5

Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent but published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
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 24 February 2017 (24.02.2017)

Date of mailing of the international search report
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