United States Patent [19]

Davidson

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[54] **PORTABLE BALL STOP**

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[52] **U.S. Cl.** ..... **273/55 B,** 273/181 F

[51] **Int. Cl.** **A63b 67/00**

[58] **Field of Search**... 273/26 A, 26 R, 55 B, 102 S, 273/181 F, 105 R, 176 B; 135/25 R, 25 A, 20 R, 20 A, 20 M

[56] **References Cited**

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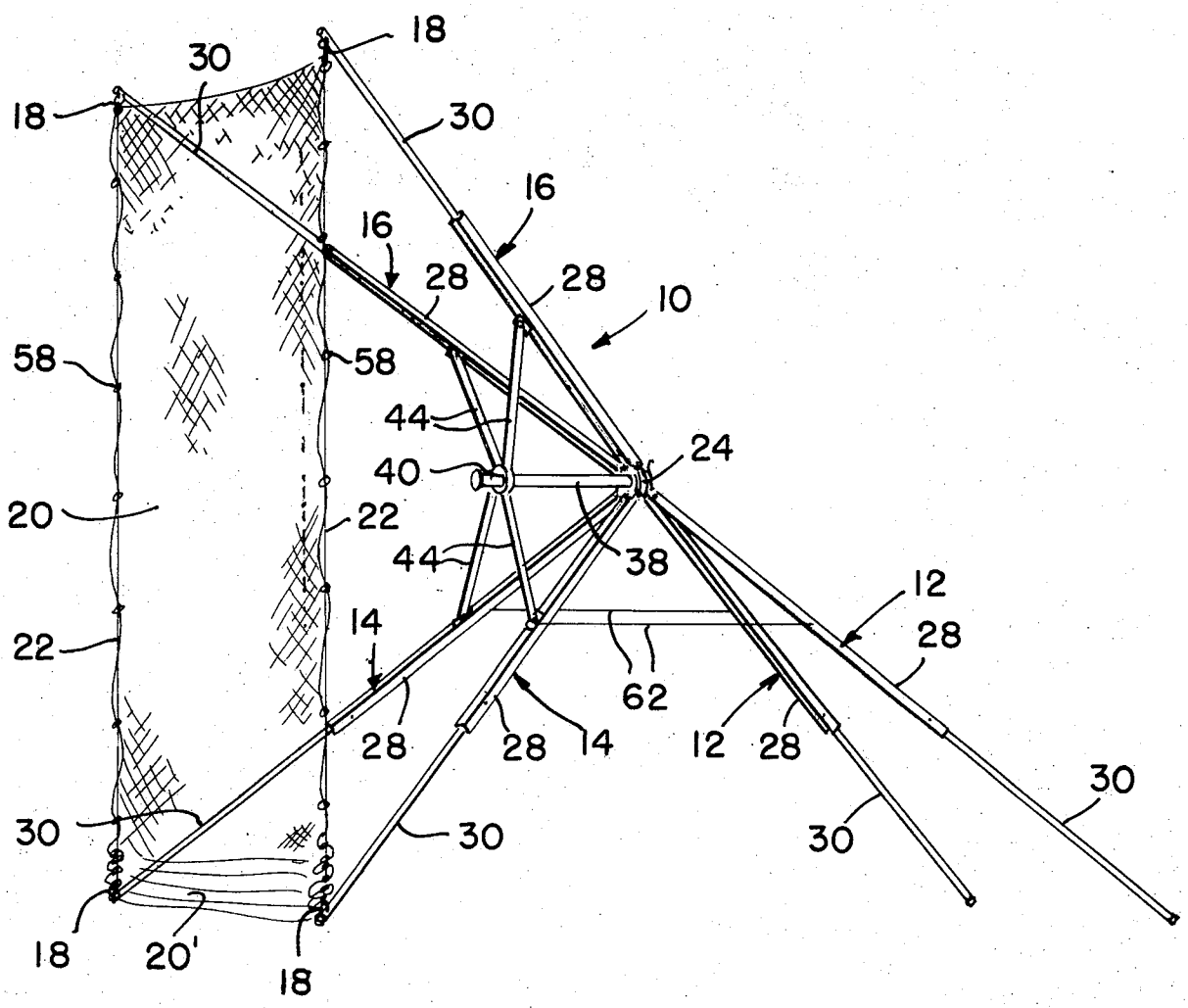
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Assistant Examiner—Theatrice Brown
Attorney, Agent, or Firm—Graybeal, Barnard, Uhlir & Hughes

[57] **ABSTRACT**

A collapsable umbellate frame having four support arms extending forwardly from a hub member is braced by a pair of rear legs into a position of stability with the free ends of two of the support arms resting on the ground and the free ends of the other two support arms positioned over them. A pair of laterally spaced apart stanchion lines are interconnected between the upper and lower free ends of the support arms. A ball stopping net of a vertical dimension substantially larger than the length of the stanchions is suspended from the upper ends of the stanchions. Slide connectors spaced along the sides of the net slidably attach it onto said stanchions, so that a ball striking said net at an upwardly directed angle will move the net vertically, to absorb the momentum of the ball. A collapsable brace assembly permits the support arms to be swung inwardly together. Each support arm includes a forward portion which is foldable back onto a rear portion which is connected to the hub member.

6 Claims, 8 Drawing Figures



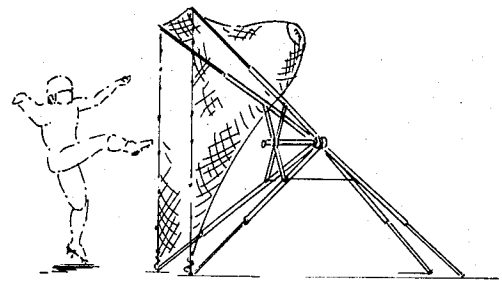


FIG. 1

FIG. 2

FIG. 3

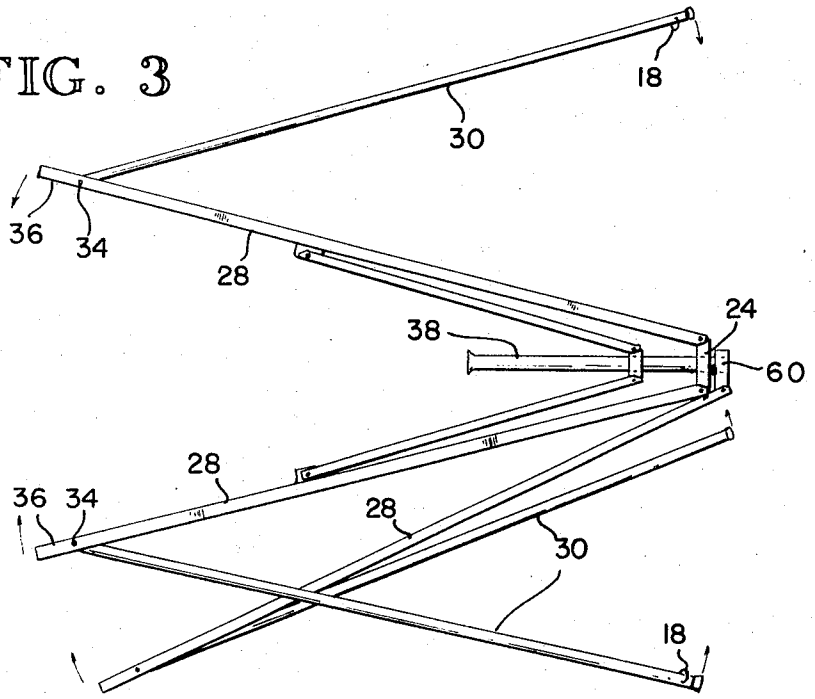


FIG. 4

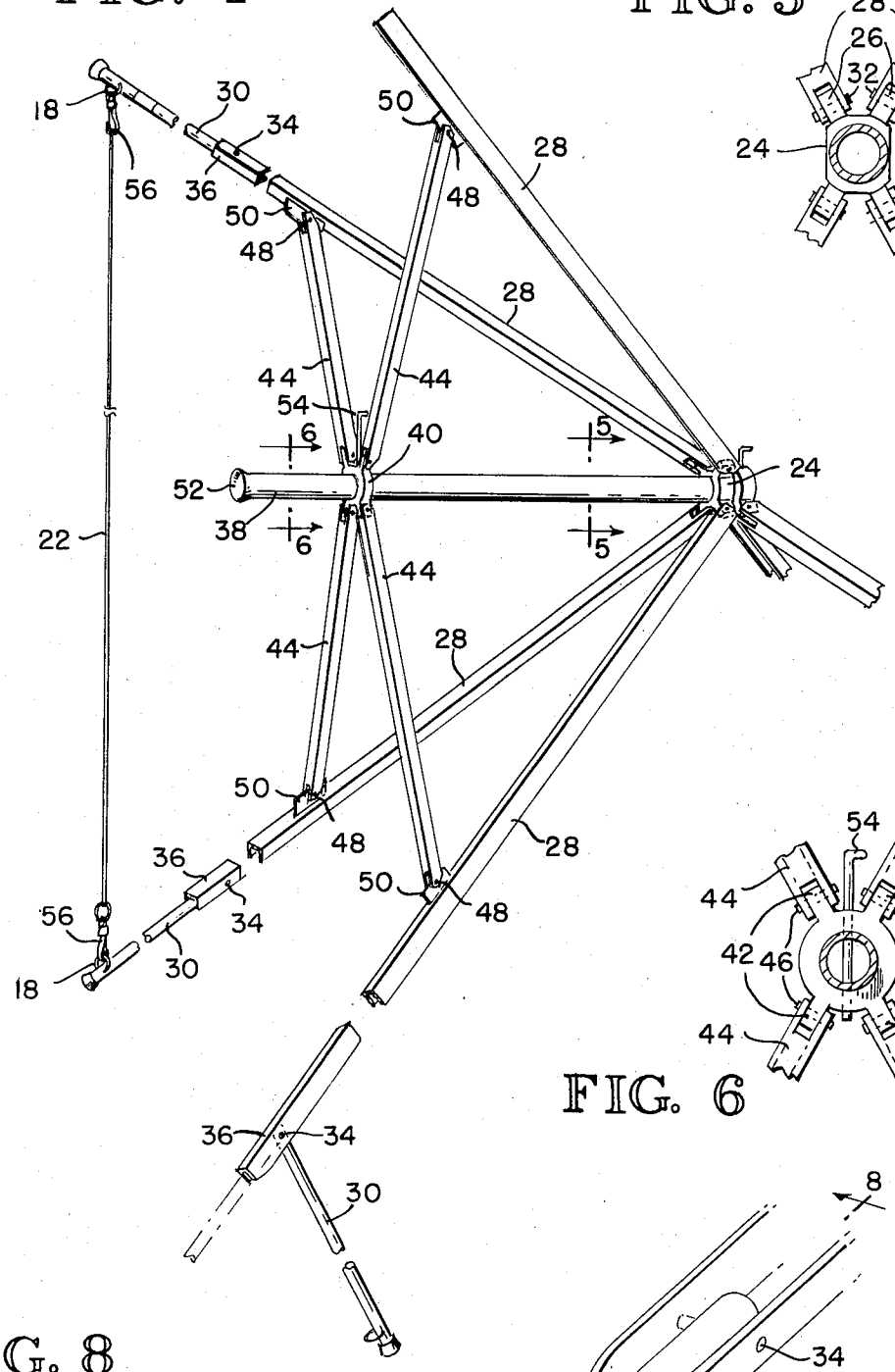


FIG. 5

FIG. 6

FIG. 8

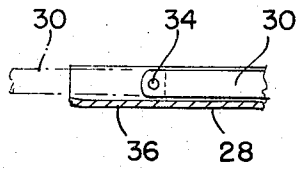


FIG. 7

PORTABLE BALL STOP

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to portable ball stopping or catching devices, and in particular to the provision of such a device which is easily and quickly assembled and disassembled and which includes a net arranged to absorb the momentum of the ball.

2. Description of the Prior Art

Known types of portable ball stops are disclosed by the following U.S. Pat. Nos. 920,907, granted May 11, 1909 to John R. Bolton; 1,566,945, granted Dec. 22, 1925 to Erestus E. Winkley; 2,805,070, granted Sept. 3, 1957 to John L. Waters; 2,895,737, granted July 21, 1959 to William A. Blees; 2,944,816, granted July 12, 1960 to Jack R. Dixon; 3,184,235, granted May 18, 1965 to Eugene M. Respini; 3,227,449, granted Jan. 4, 1966 to Frederick F. Schwab; and 3,408,071, granted Oct. 29, 1968 to Lawrence I. Lundy.

The type of backstop disclosed by U.S. Pat. No. 3,184,235 possesses several advantages over the backstops disclosed by the other patents in that it provides adequate support for the net while utilizing a minimum of frame members and its frame is readily collapsable. It is the purpose of the present invention to provide a portable collapsable ball stopping device of the general type disclosed by U.S. Pat. No. 3,184,235 but which has a frame adapted to be folded into a smaller package than the frame disclosed by U.S. Pat. No. 3,184,235, and a net which is adapted to remove momentum from the ball.

SUMMARY OF THE INVENTION

One aspect of this invention is the provision of a portable ball stop which is characterized by an umbellate main frame comprising four elongated net supporting arms which are pivotally connected at their rear ends to a hub member. A short stem extends axially forwardly from the hub member and is rigidly connected at its rear end to the hub member. A brace ring member is slidably supported on such stem and a separate brace arm for each support arm extends from the ring member outwardly to its support arm. The brace arms are pivotally attached to both the ring member and the support arms, enabling the brace arms to be folded under the support arms by a sliding movement of the ring member towards the hub member.

In the preferred embodiment each support arm is divided into forward and rear parts. The rear parts are channel members comprising two parallel side walls and an interconnecting web. The channel members are connected to the hub member in such a manner that the channel space is directed radially outwardly. The forward part of each support arm includes a rear portion which is received in the forward portion of its rear part. It is attached to its rear part by a transverse pivot pin spanning between the side walls. The pivot pin location is spaced rearwardly from the forward end of the rear part a distance sufficient to locate a substantial amount of the web forwardly of the pivot pin, to brace or restrain the forward part against inward movement past a position of coaxial alignment with the rear part. However, by this arrangement the forward part of each support arm is freely movable radially outwardly and can be folded back into the channel space of its rear part. The ball receiving net is mounted onto the forward ends of the support arms in such a manner that it applies a radially inwardly directed force on the support arm forward parts, urging them into bracing contact with the web portions of the rear parts.

Another important aspect of the invention is the provision of a net which is supported by and between a pair of stanchions. The net is fixed in a position at the upper ends of the stanchions and hangs downwardly from the points of connection. It is vertically longer than the stanchions and is provided with slide connector means along each of its sides, slidably attaching it onto the stanchions. Owing to this arrangement, when struck by a ball at an upwardly directed angle, the net will move vertically and in so doing will absorb the momentum of the ball.

In the preferred embodiment the stanchions are interconnected between the upper and lower forward ends of the elongated support members and the ball stop is adapted for catching a kicked football. The umbellate nature of the support frame provides an open space of considerable depth behind the normal net position and also in the path of upward travel of a kicked football into which space the net can move when struck by the ball.

The kicking aspect of the game of football quite frequently determines the outcome of any given game. Yet, field goal kickers and punters are presently most always sent into the ball game relatively "cold." They usually swing their kicking foot into the air but they do not have the opportunity to actually kick a ball. The ball stop of this invention can be readily assembled and disassembled along the side lines of a football field to serve as a catching device into which the kicker can actually kick the football as a "warm-up" for himself. Of course, the ball stop of this invention is not limited to this use but rather can be used for catching or stopping the flight of other types of balls or projectiles.

These and other features, advantages, and characteristics of the ball stops of this invention will be apparent from the following detailed description of a typical and therefore non-limited embodiment of the invention, and from the accompanying drawing illustrating such embodiment.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a pictorial view of an embodiment of the invention showing it being used for catching a kicked football, such view depicting the ability of the net to absorb the momentum of the ball;

FIG. 2 is an enlarged scale pictorial view of such embodiment;

FIG. 3 is a side view of the frame portion of the embodiment in a partially collapsed condition;

FIG. 4 is a fragmentary perspective view of the main frame on yet a larger scale;

FIG. 5 is an enlarged sectional view through the brace stem looking toward the rear hub member, showing only fragmentary portions of the support arms;

FIG. 6 is another view taken through the brace stem looking toward the sliding ring member at the center of the brace assembly and showing only fragmentary portions of the brace arms;

FIG. 7 is a fragmentary pictorial view of a support arm whereat the forward part of such arm is connected to the rear part of such arm; and

FIG. 8 is a sectional view taken substantially along line 8—8 of FIG. 7, but showing the support arm forward part folded back into the inner part.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The illustrated embodiment comprises a main frame **10** of umbellate form which is propped by a pair of rear legs **12** into a position with two of its four elongated support arms **14** contacting the ground and the remaining two support arms **16** positioned above them. Connector rings **18** or the like are provided at the forward end portions of the support arms **14, 16** to receive fasteners carried by the net **20** and/or its support stanchions **22.**

Main frame **10** comprises a rear hub member **24** (FIG. **5**) having four short generally radial mounting stubs **26.** The base portion of the hub **24** from which the stubs **26** extend is rectangular rather than square so that the vertical spacing of the points **18** is larger than the horizontal spacing of the point **18.**

Each support arm **14, 16** comprises a rear part **28** of radially outwardly opening channel form and a forward part which may be tubular.

The rear end portions of the rear parts **28** are pivotally connected to the stubs **26,** such as by pivot pins **32** (FIG. **5**), so that the support arm inner parts **28** can be swung in-and-out relative to the axis of hub **24.**

The support arm outer parts **30** have rear end portions which are received within the forward end portions of the rear parts **28.** Cross-pins **34** spanning between the side walls of the channel members **28** pivotally attach the forward parts **30** to such rear parts **28.** The pivot pins **34** are spaced rearwardly of the forward ends of members **28** a distance sufficient to place a substantial portion **36** of the channel web forwardly of the pivot pin **34,** to function as a brace for prevention of inward pivotal movement or folding of the forward parts **30** beyond generally coaxial positions with respect to the rear parts **28.** As best shown by FIG. **3,** the forward parts **30** are foldable between such positions of coaxial alignment with the rear parts **28** and positions wherein they are housed within the open channel spaces of the rear parts **28** (FIG. **8**).

The umbellate main frame **10** also includes a brace assembly for the support arms **14, 16,** comprising an elongated support stem **38** which projects coaxially forwardly from the hub member **24.** A ring member **40** is slidably mounted on the stem **38.** It includes radial stubs **42** to which the inner end portions of four brace arms **44** are pivotally attached, such as by pivot pins **46.** The outer end portions of brace arms **44** are pivotally attached, such as by pivot pins **48** to brackets **50** extending inwardly from the support arms rear parts **28.** The axes of the pivot pins **32, 46, 48** are all parallel and are all perpendicular to the swing paths of the arm parts **28** and the brace arms **44.** The pivot pins **48** are spaced outwardly from the pivot pins **32** a distance that is sufficiently longer than the brace arms **44** to enable the brace arms **44** to be folded under the support arm parts **28** (FIG. **3**). Such folding is accomplished by a simple sliding movement of the slide ring **40,** as will hereinafter be explained in greater detail. As shown by FIG. **7,** the side walls of each channel part **28** may be displaced inwardly to form a friction clamp for holding the forward parts **30** steady.

The brace stem **38** is provided with an enlarged forward end portion **52** which is larger in diameter than the opening within the slide ring member **40,** to prevent forward movement of the ring member **40** off from stem **38.** The ring member **40** may carry a lock pin **54** which is movable into a transverse opening in the brace stem **38** (FIG. **4**), to secure the ring member **40** to the brace stem **39** for locking the brace arms **44** into their bracing positions.

The illustrated embodiment of the ball stop is especially adapted to function as a catcher for a kicked football. It comprises a net which is supported along its sides by a pair of stanchion lines **22.** The stanchion lines **22** have connectors **56** at their upper ends for connecting them to the upper pair of rings **18** and connectors **56** at their lower ends for connecting them to the lower pair of rings **18.** The vertical spacing of the connector rings **18** is slightly greater than the length of the stanchions **22** measured between their end connectors **56.** As a result, when the stanchions **22** are installed on the frame **10** they exert slight inwardly directed bending forces on the support arms **14, 16,** tending to urge the support arm forward parts **30** into tight bracing contact with the web portions **36** of the support arm rear parts **28.**

The net is slack both horizontally and vertically. Its vertical dimension is substantially larger than the stanchion length. The upper and lower ends of the net **20** are connected to the upper and lower ends of the stanchions **22** or to the rings **18** in a manner fixing them in position relative to the stanchions **22.** However, between its upper and lower ends the net **20** is only slidably connected to the stanchions **22,** such as by a plurality of slide rings **58** spaced along the vertical side edges of the net **20.** When the net **20** is in a static condition the excess net material **20'** is merely gathered in a loose pile on the ground.

As shown by FIG. **1,** a football kicked into the net **20** moves the net **20** both rearwardly and upwardly. Vertical movement of the net **20** beyond that obtained by distortion of the net wall alone is made possible by the slidable mounting of the net **20** onto the stanchions **22.** The umbellate construction of the main frame **10** results in there being a substantial open space both directly rearwardly of the static position of the net **20** and in the upper rearward region between the upper pair of support arms **16.** This enables the net **20** to move rearwardly and upwardly a substantial distance without either it or the bell contacting and disturbing the frame **10.** Net movement is desirable because it effectively absorbs the momentum of the ball, preventing the ball from merely striking the net and bouncing back.

As earlier described, the main frame **10** may be propped up into position by a pair of rear legs **12.** In the preferred embodiments these rear legs **12** are constructed like the support arms **14, 16** so that they can also be folded (FIG. **3**). In use, the propped legs **12** in effect form with the lower support arms **14** a quadruped base of umbellate form. The upper ends of the brace leg channel parts **28** may be attached to a member **60** which is like hub **24** except that it only possesses two mounting lugs. Such member **60** is shown to be attachable to a rearward extension of the brace stem **38,** immediately rearwardly of the hub member **24.**

As best shown by FIG. **3,** the net supporting frame of this invention is foldable into a relatively small and compact package which in length is about equal to the

length of a support arm rear part **28** and in transverse dimension is about the size of the distance diagonally across mounting lugs **26.** The net **20,** with stanchions **22** attached thereto, is itself folded or rolled up into a relatively small and compact package, to be stored either together with or separate from the folded frame.

The folded net supporting frame is easily and quickly erected by the user by first unfolding the support arm and prop leg outer parts **30** outwrdly into their extended positions. Next, the ring member **40** is slid forwardly along stem **38** until the lock pin **54** is in alignment with the lock pin openings in the stem **38,** and then the lock pin **54** is set into such openings. This opening movement of the support arms **14, 16** is preferably done after the net supporting stanchions **22** have been attached to the rings **18.** The brace legs **12** are moved apart and adjusted in position relative to the lower pair of support arms **14** to place the main frame **10** in the desired attitude. A pair of straps or lines **62** may be connected between upper portions of the lower support arms **14** and the brace legs **12** to keep them from spreading apart.

From the foregoing, various modifications, further component arrangements and modes of utilization of the ball stopping mechanism will be apparent to those skilled in the art to which the invention is addressed, within the scope of the following claims.

What is claimed is:

1. A portable ball stop, comprising:

an umbellate net supporting frame comprising a rear hub member, four support arms extending forwardly from said rear hub member in an umbellate relationship and terminating in free end portions, pivot pin means pivotally connecting the support arms to said hub member, a support stem for a brace assembly rigidly attached to said rear hub member and extending axially forwardly therefrom, and a collapsible brace assembly for the support arms comprising a ring member surrounding said stem and being slidable axially therealong, and four radial brace members, each of which is pivotally connected at one of its ends to the sliding ring member and is pivotally connected at its opposite end to the rear part of one of the support arms at a location on such rear part spaced from the hub member a distance slightly greater than the length of such brace arm;

a pair of laterally spaced apart line members in tension interconnected between the free end portions of said support arms;

a net supported by and between said line members, said net having a vertical dimension that is substantially larger than the length of said line members;

means securing the upper portion of said net to said stop;

slide connector means along the sides of said net slidably attaching said net onto said line members below said upper portion so that a ball striking said net at an upwardly directed angle will move the net vertically, to absorb the momentum of the ball, as well as rearwardly into the space between said support arms; and

a rear prop connected to the umbellate frame, for holding it in a position placing the net generally vertical.

2. A portable ball stop according to claim **1,** wherein said prop comprises a pair of rear legs which are detachably connectable to the support stem adjacent said hub member and which extend in an umbellate relationship with two of said support arms.

3. A portable ball stop comprising a net and means for holding said net generally vertical, including an umbellate frame comprising a rear hub member, four support arms extending forwardly from said rear hub member in an umbellate relationship, said support arms comprising radially outwardly opening channel shaped rear parts which are attached to the rear hub member, said support arm rear parts being pivotally attached to said rear hub member, forward parts having forward end portions to which the net is detachably connected, and pivot pin means pivotally connecting the forward parts to the rear parts for pivotal movement of each said forward part between a folded position wherein it is housed within the channel of its rear part and an extended position in which it extends coaxially forwardly from its rear part, a support stem for a brace assembly rigidly attached to said rear hub member and extending axially forwardly therefrom, and a collapsible brace assembly for the support arms comprising a ring member surrounding said stem and being slidable axially therealong, and four elongated radially extending brace members, each of which is pivotally connected at one of its ends to the sliding ring member and is pivotally connected at its opposite end to the rear part of one of the support arms at a location on such rear part spaced from the hub member a distance slightly greater than the length of such brace arm, the channel shaped rear parts of the support arms comprise radial side walls and an interconnecting web, and wherein the pivot pin means comprises a pivot pin for each support arm which extend laterally of the side walls of the support arm rear part and through the rear portion of the support arm forward part, at a location spaced a sufficient distance back from the forward end of such rear part so that the web portion forwardly of the pivot pin will brace the forward part against rotation inwardly beyond a coaxial position with the rear part, and wherein said net includes means mounting it onto the forward parts of the support arms in such a manner that a generally radially inwardly directed force is applied on the forward part of each support arm, tending to rotate it against its said bracing web portion.

4. A portable ball stop according to claim **3,** wherein said means for mounting the net onto the forward parts of the support arms comprises a pair of laterally spaced apart, generally vertical lines in tension, each of which is interconnected between the forward part of a lower support arm and the forward part of an upper support arm, wherein said net has a vertical dimension which is substantially larger than the length of the lines, and said ball stop also includes means securing the upper portion of said net to said ball stop, and slide connector means along the sides of said net, slidably attaching said net onto said lines below said upper portion, so that a ball striking said net at an upwardly directed angle will move the net vertically, to absorb the momentum of the ball said ball stop also includes a rear prop connected to the umbellate frame.

5. A portable ball stop according to claim **4,** wherein said prop comprises a pair of rear legs which are connected to the umbellate frame adjacent said hub member and which extend in an umbellate relationship with two of said support arms.

6. A portable ball stop according to claim **3,** further comprising a rear prop connected to the umbellate frame, for holding it in a position placing the net generally vertical.

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