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Mahoney

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[45] **Aug. 14, 1973**

[54] **PROJECTILE RETURN APPARATUS**

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[73] Assignee: **Mahoney, Inc.**, Dorrance, Kans.

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[52] **U.S. Cl.**..... **273/1.5 A**, 248/156, 248/185, 248/188.7, 248/206 R, 248/413, 273/26 A

[51] **Int. Cl.**..... **A63b 69/00**

[58] **Field of Search**..... 273/1.5 A, 1 R, 26 A, 273/29 A; 248/181, 185, 413, 48, 156, 188.7, 44, 45, 46, 47, 206 R, 363; 272/83

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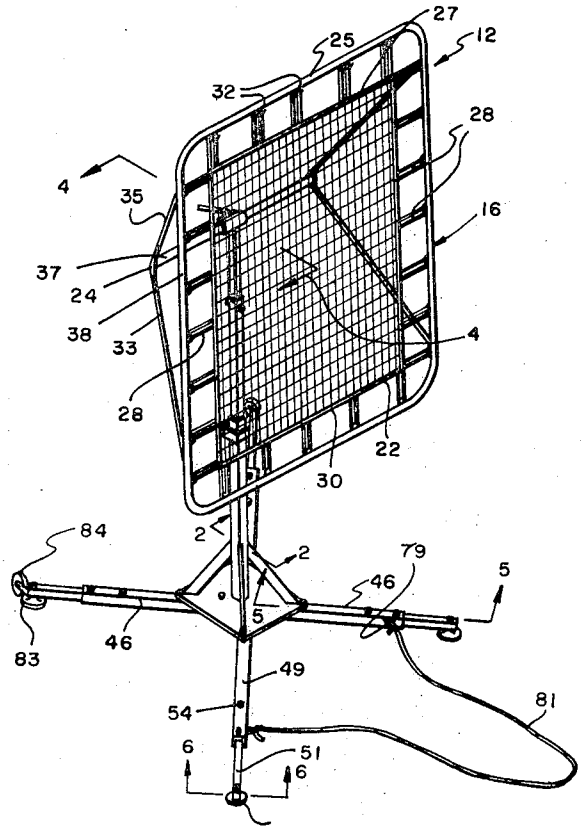
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[57] **ABSTRACT**

A backstop return panel is spaced forwardly from a rearwardly inclined, telescopic, support post by two pair of side braces. Each pair of side braces is secured to respective opposite ends of a shaft which in turn is mounted to the support post for pivotal movement about a horizontal axis by a releasable clamp. The support post is mounted to an X-shaped base. Each foot of the base is telescopic and has mounted at its outer end a flanged suction cup with a hole at the midpoint of the flange, and a suction cup release device comprising a pivoted roller.

3 Claims, 10 Drawing Figures



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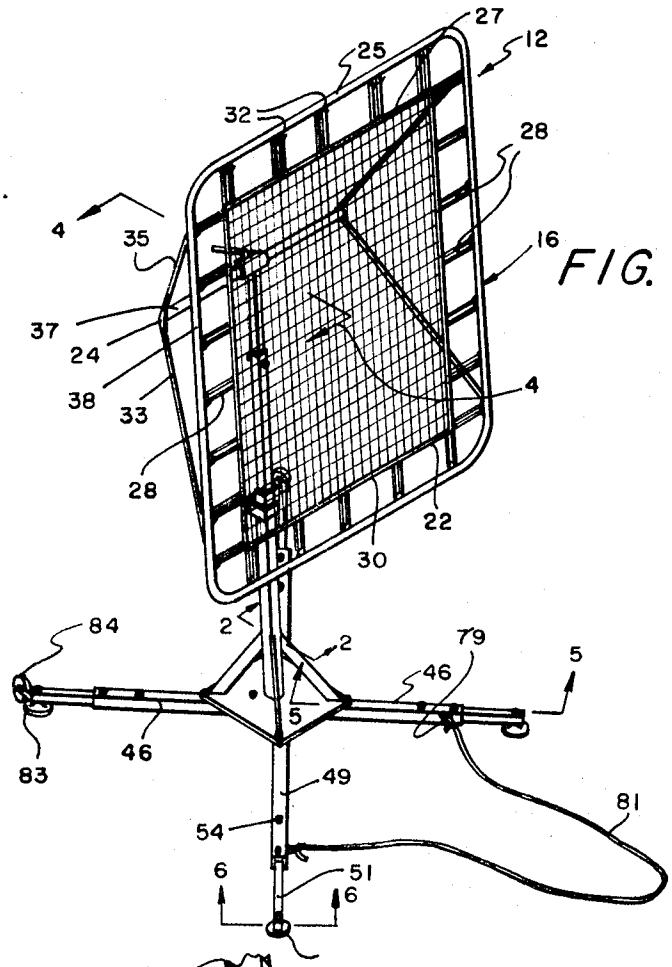


FIG. 1

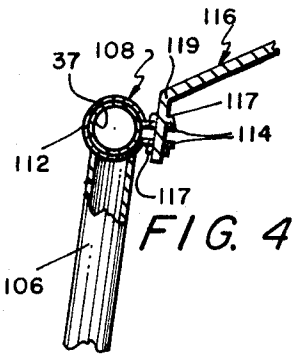


FIG. 4

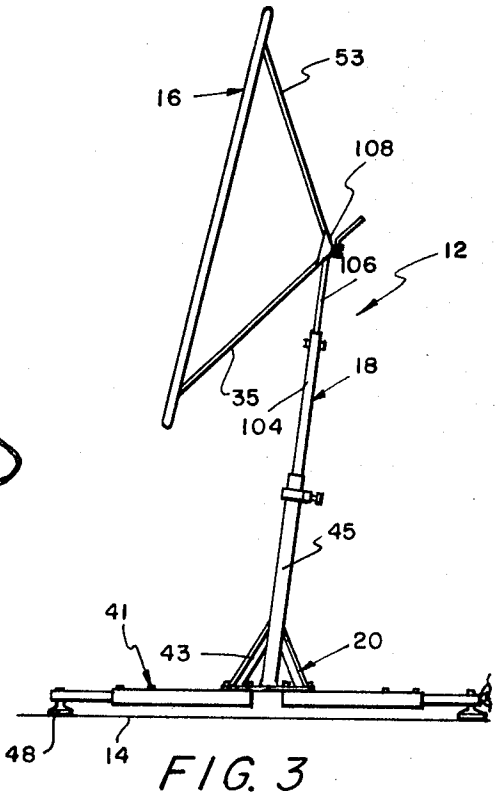


FIG. 3

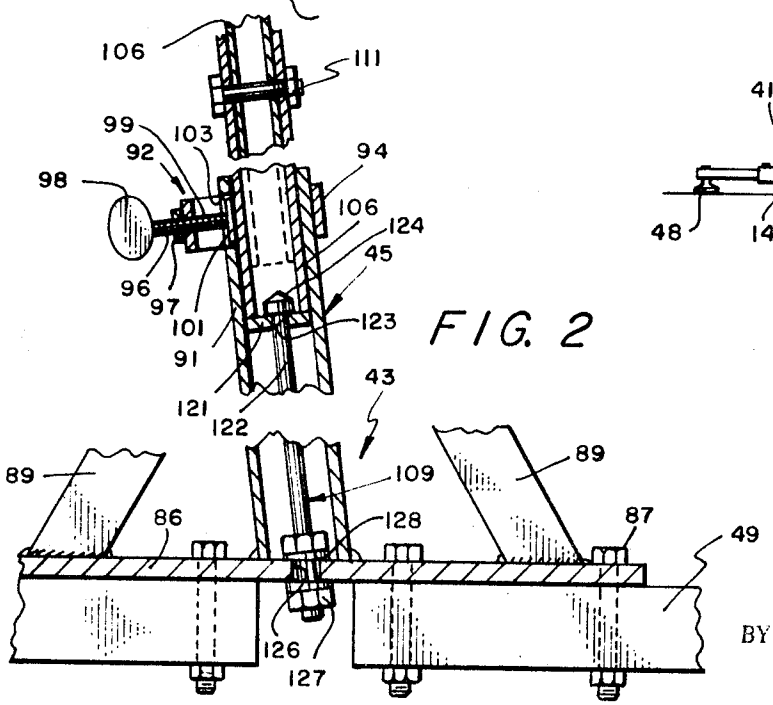


FIG. 2

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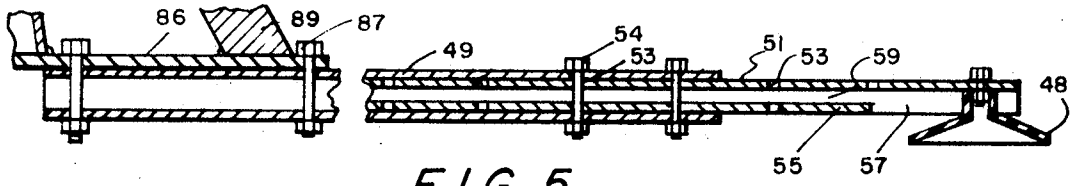


FIG. 5

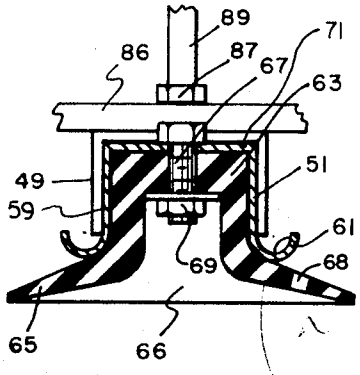


FIG. 6

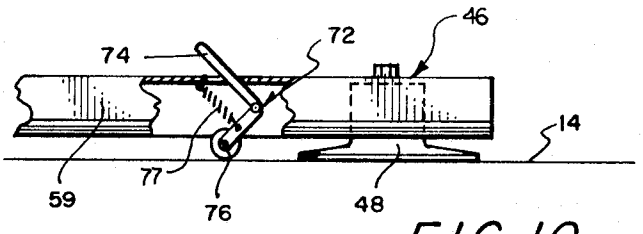


FIG. 10

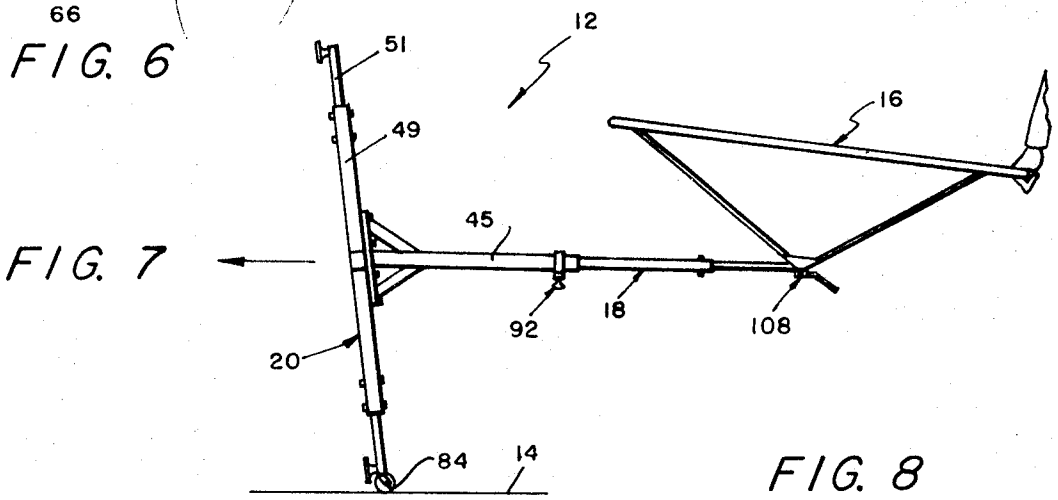
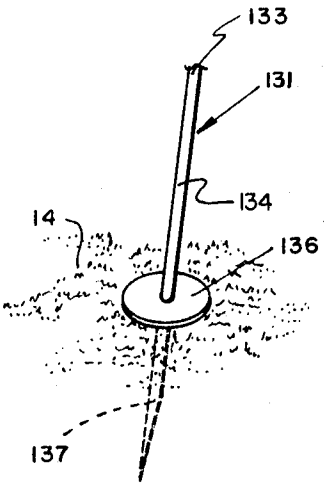


FIG. 7

FIG. 8



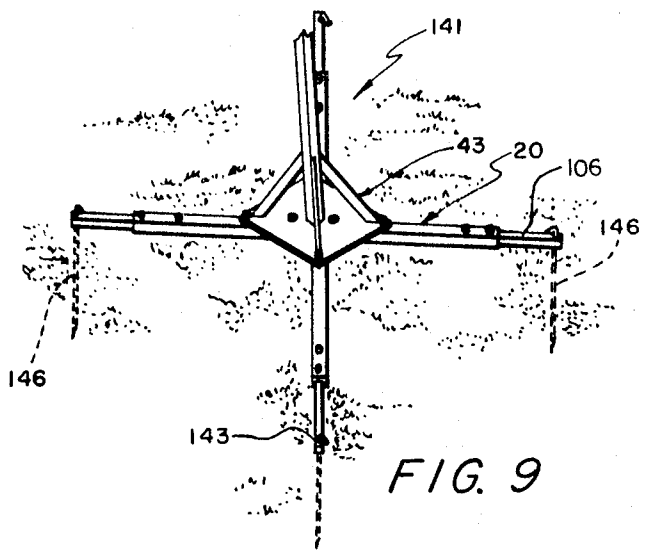


FIG. 9

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PROJECTILE RETURN APPARATUS

This application presents an improvement over U.S. Pat. No. 3,427,026, entitled "Projectile Return Apparatus"; the inventor being Kenneth J. Mahoney; and issued Feb. 11, 1969.

Numerous types of backstop or return apparatus are known to the prior art including many which provide rigid or resilient net structures. The structures known in the prior art are operable to return footballs, basketballs as dropped through a goal structure, etc., but such devices are normally limited in use and complicated in structure. Additionally, most of the prior art structures are not readily portable, simple to use, nor easily adjustable to a plurality of different positions for various purposes.

In accordance with the present invention, a new improved projectile return apparatus used as a practice means for sports is provided which includes a backstop means; a base frame means; and an adjustable connecting means to connect the backstop means to the base frame means. The backstop means includes a return panel assembly connected to a main panel support assembly. The return panel assembly includes a panel member connected by resilient connector straps to a tubular support frame. The panel member is operable to resiliently absorb the impact of a projectile thrown thereagainst and return the same according the angle at which it was initially impacted. The panel support assembly includes a pair of spaced side members secured to opposite sides of the support frame and having the outer ends connected to a common support shaft. The base frame means includes a main base support assembly secured through an anchor assembly to an upwardly inclined support post assembly. The base support assembly includes four cooperating telescoping leg assemblies having innermost ends interconnected to a horizontal base plate member of the anchor assembly. Each leg assembly includes a primary tubular member having a secondary tubular member telescopingly mounted therewithin anchored by bolt members in the axially adjusted position. The outer end of each leg assembly includes a cup member operable to contact a given support surface for securing the same thereto. A rearward pair of the leg assemblies are further provided with caster wheel assemblies so that the same is engagable with the support surface on tilting of the entire projectile return apparatus for ease of conveyance. The anchor assembly further includes upright support struts having the outer ends secured as by welding to the base plate member and upper ends secured to the support post assembly. The support post assembly includes a main tubular post member secured by welding to the aforementioned base plate member and having a clamp assembly mounted on the upper end. The support clamp is provided with a thumb screw actuator engagable with a portion of the adjustable connector means. The adjustable connector means includes first and second telescoping tube members having the first tube member telescopingly mounted within the tubular post member. The upper or second tube member is provided with a clamp connector assembly engagable with the support shaft. The clamp connector assembly is provided with a C-clamp member welded to the upper end of the second tube member and having outer opposed cooperating legs interconnected through an actuator handle rod so as to be clamped and released from rigid connection to the support shaft. The first and second telescoping members are interconnected through nut and bolt members to provide the desired height adjustment. The first telescoping tube member has its lower end closed by a base plate to receive a safety rod assembly therein. More particularly the safety rod assembly includes an elongated rod member having it's lower end mounted within a hole in the base plate member and provided at the upper end with an enlarged head portion. The rod member is of a length less than the first telescoping tube member adapted to contact the base plate against the head portion on upward movement to assure that the backstop means is not removed inadvertently.

One object of this invention is to provide a new improved projectile return apparatus overcoming the aforementioned disadvantages of the prior art devices.

A further object of this invention is to provide an improved projectile return apparatus having a backstop means supported upon a base frame means whereby the frame means is readily movable relative to a supporting ground surface while providing a rigid support in a stationary position so as to maintain the backstop means rigid when a projectile is thrown thereagainst.

Still, another object of this invention is to provide an improved projectile return apparatus having a resilient backstop means supported above a given ground surface and readily movable as desired to a given angularly adjusted position with a minimum amount of effort.

Another object of this invention is to provide an improved projectile return apparatus having a backstop means connected through an adjustable connecting means to a base frame means whereupon the predetermined cooperating relationship therebetween is such to assure that the projectile return apparatus will be maintained in a working condition no matter what angle the projectile is thrown thereagainst and the reaction force received therefrom.

Still, one further object of this invention is to provide an improved projectile return apparatus which is economical to manufacture; simple to operate; durable in construction; and readily adaptable to a plurality of training usages.

Various other objects, advantages, and features of the invention will become apparent to those skilled in the art from the following discussion, taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a perspective view of an improved projectile return apparatus of this invention;

FIG. 2 is an enlarged fragmentary sectional view taken along line 2—2 of FIG. 1;

FIG. 3 is a side elevational view of the improved projectile return apparatus of this invention;

FIG. 4 is an enlarged fragmentary sectional view taken along line 4—4 in FIG. 1;

FIG. 5 is an enlarged fragmentary sectional view taken along line 5—5 in FIG. 1;

FIG. 6 is an enlarged fragmentary sectional view taken along line 6—6 in FIG. 1;

FIG. 7 is a side elevational view of the improved return apparatus of this invention illustrating the same in a tilted conveyance condition;

FIG. 8 is a fragmentary perspective view illustrating another embodiment of a base means of the return apparatus of this invention for connecting to a ground surface;

FIG. 9 is a fragmentary perspective view of a base frame means of another embodiment of an improved projectile return apparatus of this invention; and

FIG. 10 is a sectional view illustrating the addition of a roller structure to readily disengage the improved projectile return apparatus of this invention from a given support surface.

The following is a discussion and description of preferred specific embodiments of the new projectile return apparatus of this invention, such being made with reference to the drawings, whereupon the same reference numerals are used to indicate the same or similar parts and/or structure. It is to be understood that such discussion and description is not to unduly limit the scope of the invention.

Referring to the drawings in detail and in particular to FIG. 1, an improved projectile return apparatus of this invention, indicated at 12, is operable to be connected to a support surface 14. The projectile return apparatus 12 includes a main backstop means 16 connected through an adjustable connecting means 18 to a base frame means 20 which, in turn, is mounted on the support surface 14.

The backstop means 16 includes a return panel assembly 22 connected to a panel support assembly 24 which is pivotally mounted upon the adjustable connecting means 18. The return panel assembly 22 includes a main support frame 25 having a panel member 27 secured thereto through a plurality of resilient connector straps 28. The panel member 27 is of a generally rectangular shape constructed of a knitted fabric similar to that found on a conventional trampoline. More particularly, the panel member 27 has a plurality of cross-strips joined at the outer periphery by an edging 30. The support frame 25 is a generally square or rectangular shape constructed of a tubular material having a plurality of hooks 32 secured thereto. The connector straps 28 are looped about the adjacent peripherial edge of te panel member 27 and having the outer ends secured to the hooks 32 to provide the desired tension to the panel member 27.

The panel support assembly 24 includes pairs of cooperating side brace members 33 and 35 secured to each opposite side of the support frame 25 and having common apex portions secured to opposite ends of a support shaft 37. The respective side brace members 33 and 35 are connected to upper and lower portions of vertital side bars 38 to achieve the necessary support as will become obvious. A mid portion of the support shaft 37 is connected to the connecting means 18 in a manner to be described.

The base frame means 20 includes a base support assembly 41 secured by an anchor assembly 43 to an upwardly inclined support post assembly 45. The base support assembly 41 includes four telescoping leg assemblies 46 secured at the inner ends to the anchor assembly 43 and having support cup members 48 secured to the outer ends of the leg assemblies 46 for attachment to the support surface 14 as will be explained. Each telescoping leg assembly 46 includes a primary tube member 49 having a secondary tube member 51 telescopingly received therewithin, each of a square tubular shape in transverse cross-section. Each of the first and secondary tube members 49 and 51 are provided with a plurality of alignable spaced holes 53 so as to receive nut and bolt members 54 to secure the secondary tube member 51 in a given axial position relative to the primary tubular member 49 to achieve the desired length.

As shown in FIG. 5, the outer end of the secondary tube member 51 is provided with a bottom wall 55 having a cut-out portion indicated at 57 so as to receive the respective support cup members 48 therein. Also, as shown in FIG. 6, it is seen that upright side walls 59 of the secondary tube member 51 is provided with s semi-circular section 61 formed from the bottom wall 55. The semi-circular section 61 is operable to contact the support surface 14 in case 4f a failure in respective one's of the support cup members 48 to prevent damage to a basketball court or the like. The support cup members 48 are provided with a main body 63 integral with an outwardly divergent flange section 65 to provide a suction area 66. The flange section 65 has a hole 68 at a mid-section for ease of release as will be explained. The main body 63 is secured by a bolt member 67 and a nut member 69 to a top wall 71 of the secondary tube member 51. It is seen that the bolt member 67 is selected of such a length whereas, on failure or damage to the support cup member 48, the bolt member 67 will not contact the support surface 14 as of a length less than the sidewalls 59.

As shown in FIG. 10, an additional feature added to the secondary tube membr 51 is the use of a pivotal roller structure 72 including an actuator arm 74 having a roller member 76 on the outer end thereof. The actuator arm 74 is pivotally connected to the sidewalls 59 of the secondary tube member 51. A spring member 77 biases the roller member 76 upwardly to the inactive position. The actuator arm 74 can be pushed downwardly in a counter-clockwise motion as viewed in FIG. 10 in order to move the respective leg assembly 46 upwardly so as to release the support cup member 48 from its suction grip of the support surface 14.

As shown in FIG. 1, it is seen that the forward ones of the primary tube members 49 are provided with facing hook members 79 to receive a rope member 81 thereupon which is desirable in sliding the projectile return apparatus 12 to a different location. Additionally, it is obvious that the rope member 81 can be pulled upwardly to aid in releasing the forward ones of the support cup members 48 from the support surface 14. It is seen that the rearward ones of the telescoping leg assemblies 46 are provided with parallel support lugs 83, each having a roller wheel member 84 mounted thereon. The lower surface of the wheel members 84, when in the condition as shown in FIG. 1, are above the support surface 14 but operable to contact the same when in the tilted position of FIG. 7 for ease of conveyance along the support surface 14.

The anchor assembly 43 includes a main base plate member 86 of a generally square shape having each of its corners secured as by nut and bolt members 87 to respective ones of the primary tube members 49. The base plate member 86 includes a central portion to receive the support post assembly 45 which is welded thereto. Additionally, the anchor assembly 43 is provided with a plurality of spaced upright support struts 89 secured as by welding to respective corners of the base plate member 86 and at the upper ends to the support post assembly 45 to achieve the necessary lateral stability.

The support post assembly 45 includes a main post member 91 of rectangular shape in transverse cross-section having a clamp assembly 92 secured to an

upper portion thereof. The post member **91** is inclined rearwardly at an angle of between 80° and 85° for reasons to become obvious. The clamp assembly **92** is provided with a rectangular support housing **94** having an actuator assembly **96** connected thereto. More particularly, the support housing **44** is secured by welding to the outer surface at the upper end of the post member **91** and is provided with a nut member **97** welded to an outer section thereof. The actuator assembly **96** includes a thumb screw member **98** having a thumb portion at one end integral with a threaded shaft **99** to a clamp plate member **101.** The shaft **99** is movable within the nut member **97** and the clamp plate member **101** is received within a cut-out portion **103** of the post member **91** to contact against a portion of the connecting means **18** as will become obvious.

The adjustable connecting means **18** includes first and second tube members **104** and **106** having a clamp connector assembly **108** secured to the upper end of the first tube member **104** and a safety rod assembly **109** operably connectable to the lower end of the second tube member **106.** The first tube member **104** is received in a telescoping manner within the second tube member **106,** both of which are square shape in transverse cross-section and anchored in a given adjusted height position by nut and bolt members **111.** It is to be noted that this feature of the first tube member **104** allows an additional height adjustment of the combination of the first and second tube members **104** and **106** which is desirable when being utilized for college players instead of perhaps grade and high school players.

As shown in FIG. **4,** the clamp connector assembly **108** includes a C-shaped clamp member **112** secured by welding to the upper end of the first tube member **104** and having outer parallel legs **114** operably connected to an actuator handle assembly **116.** More particularly, the actuator handle assembly **116** includes a pair of threaded nut members **117** secured to the outer surfaces of the legs **114** and having a threaded handle member **119** connected thereto. The support shaft **37** is received within the clamp member **112** whereupon selective rotation of the handle member **119** operates to either loosen or tighten the clamping force against the support shaft **37** to hold the backstop means **16** in an adjusted position about a horizontal axis. It is noted that a considerable contact area between the clamp member **112** and the support shaft **37** operates to provide substantial frictional engagement to maintain the backstop means **16** in an adjusted position.

As shown in FIG. **2,** the second tube member **106** includes a plate member **121** welded across the lower end portion having a central hole **123** to receive the safety rod assembly **109** therein. More particularly, the safety rod assembly **109** includes an elongated rod member **122** having threads at one end and a tapered head section **124** at tht upper end. The rod member **122** is placed through the hole **123** in the plate member **121** having its lower end extended through a hole **126** in the base plate member **86** of the anchor assembly **43.** A pair of nut members **127** with respective lock washers **128** are threaded upon the lower end of the rod member **122** to secure the same to the base plate member **86.** The tapered head section **124** is dimensioned so as to be received within both the first and second tube members **104** and **106.** The tapered head section **124** provides a self-centering feature in regards to the first tube member **104** on downward movement thereabout. Also, it is noted in the abutting condition of FIG. **2** that the lower surface of the head section **124** contacts the plate member **121** to limit the upward movement of the interconnected first and second tube members **104** and **106** to prevent the same from being inadvertently moved out of telescoping relationship to the post member **91.**

In the use and operation of the improved projectile return apparatus **12** of this invention, it is seen that the structure is placed on the support surface **14** whereupon downward pressure against the outer ends of the respective leg assemblies **46** causes the respective support cup members **48** to grasp the surface **14** through suction force. Next, it is obvious that the handle member **119** of the clamp connector assembly **108** can be loosened in order to pivot the return panel assembly **22** to the desired adjusted position about a horizontal axis. If desired, the first and second tube members **104** and **106** can be moved axially relative to each other to achieve a maximum height as shown in FIG. **1** and secured in the adjusted position as by the nut and bolt member **111.** Next, the second tube member **106** can be moved axially relative to the post member **91** to achieve a desired overall vertical height of the panel member **27** and anchored in a given adjusted position through the clamp assembly **92.** More particularly, it is seen that rotation of the thumb screw member **98** of the clamp assembly **92** operates to force the clamp plate member **101** against the adjacent outer surface of the second tube member **106** and, due to the large area of contact, provides substantial rigidity in this adjusted position. In this condition, it is seen that the backstop means **16** can be used, for example, to return a basketball thrown thereagainst. The backstop means **16** having been adjusted vertically and horizontally achieves the desired angular position relative to a player planning to use the same. It is obvious that the angular position of the panel member **27** results in variation of the direction of return of a basketball thrown thereagainst whereby a single player may utilize the same to practice throwing and receiving the basketball and to run pass plays.

Additionally, the improved projectile return apparatus **12** can be placed under a basketball goal (not shown) and operable in this position, for example, to rturn free throws. In the position shown in FIG. **1,** the return apparatus **12** can be adjusted upwardly permitting the players to practice overhead passes normally used in throwing the basketball to the pivot or center post players. Also, a plurality of the projectile return apparatus **12** can be spaced on a basketball court so that a single player can practice numerous play combinations without requiring the assistance of other players. Additionally, the return apparatus provides a means for developing a player's reflexes and finger control as a player can stand close to the backstop means **16** and rapidly throw a ball thereagainst and receive the same to develope flexibility and control of the hands.

As shown in FIG. **3,** it has been found by research and development that the rearward angular position of the support post assembly **45** relative to the support surface **14** is extremely important and desirable in order to prevent the projectile return apparatus from falling foward after a basketball or the like has hit the same. It is found that this reaction force, if utilizing a vertical post assembly **45,** would cause the return appa-

ratus 12 to pitch forwardly and fall on its face. Therefore, it is seen that the center of gravity of the projectile return apparatus 12 is placed rearwardly of a vertical axis through the connection of the support post assembly 45 to the base plate member 86 to achieve the new and novel result of this invention.

On moving the projectile return apparatus 12 to a different location, it is seen that the roller members 76 at each one of the telescoping leg assemblies 46 can be pivoted into contact with the support surface to release the suction of the respective ones of the support cup members 48. Next, the operator can move to the rear of the return apparatus 12 and grasp the support shaft 37 and pivot the same rearwardly to place the weight on the roller members 84 as shown in FIG. 7. In this condition, it is obvious that the majority of the weight is carried vertically upon the roller members 84 and the operator may grasp the support frame 25 to move the same on the support surface 14 to a desired location. On reaching a desired location, it is obvious that the same can be again anchored to the support surface 14 as previously described.

As shown in FIG. 6, the hole 68 in the support cup members 48 are placed on the forward respective edges. Then, when the return apparatus 12 Is pivoted rearwardly to be moved, the holes 68 are initially released to permit air to enter the suction area 66 for immediate release from the support floor 14.

It is noted that the safety rod assembly 109 operates as a means to assure that the first and second telescoping tube members 104 and 106 are not moved inadvertently out of engagement with the post member 91 to prevent injury to the operator and perhaps damage to the support surface 14.

As shown in FIG. 8, an additional embodiment of a projectile return apparatus 131 is provided which can be readily anchored to support surface 14 such as the ground in a back yard or may be anchored in concrete. More particularly, a support post assembly 133 is provided having an upright support post 134 with an outer laterally extended plate member 136 secured by welding thereto and having a lower tapered end section 137. The return apparatus 131 has the connecting means 18 and the backstop means 16 identical to that in the first embodiment. In this embodiment, it is seen that one may grasp the support post 134 and place a foot upon the laterally extended plate member 136 in order to insert the tapered end section 137 into the earth for use in one's back yard or the like.

As shown in FIG. 9, another embodiment of a return apparatus 141 is provided having the identical connecting means 18 and backstop means 16 and a substantially identical base frame means 20 except having holes 143 at the outer ends of the secondary tube members 106 to receive spike members 146 therein. It is seen that this embodiment is substantially identical to the first projectile return apparatus 12 except with the spike members 146 to secure the same to a support surface such as through asphalt against lateral movement. It is obvious that the projectile return apparatus 131 and 141 can be secured through the respective anchor members to asphalt or placed in concrete if one desires a permanent installation.

All of the improved projectile return apparatuses of this invention have been described as preferably used by basketball players; however, it is obvious that the same can be used by baseball players, soccer players, etc. to practice fielding, throwing, reflexes, endurance, and the like.

As apparent from the foregoing description of preferred embodiments of the applicant's improved projectile return apparatus, a relatively simple and inexpensive means has been provided which is readily attachable to a given surface so as to provide an economical and effective means of developing and testing a player's relative skill. The applicant's construction eliminates a great deal of time consuming tedious work involved in practicing the various game plays which results in the ability of a single player to practice by himself thereby allowing each to proceed at his own desired pace. Additionally, the improved return apparatus of this invention provides a means for repeatedly practicing a given maneuver by a basketball player whereas it is a proven fact that repeated practice results in a tremendous increase in the players relative skill as the manuever becomes substantially automatic to him.

While the invention has been described in conjunction with preferred specific embodiments thereof, it will be understood that this description is intended to illustrate and not to limit the scope of the invention, which is defined by the following claims.

I claim:

1. An improved projectile return apparatus comprising;
   a. a backstop means having a return panel member connected to a panel support assembly,
   b. a base frame means having attachment means to be releasably connected to a support surface and held against lateral movement,
   c. said base frame means including a support post assembly and extended in a plane at an angle relative to the support surface,
   d. means adjustably connecting said backstop means to said base frame means whereby said return panel member may be adjusted horizontally and vertically to return a projectile thrown against said panel member at a desired angle and direction,
   e. said support post assembly including a main upright post member extended in a rearwardly inclined plane and having a clamp assembly at the upper end thereof engagable with said connecting means,
   f. said connecting means including first and second telescoping tube members having the upper end of said first tube member secured through a clamp connector assembly to said backstop means and the lower end of said second tube member telescopingly received within said post member and secured in an adjusted position by said clamp assembly,
   g. said panel support assembly having pairs of cooperating side brace mtmbers, each pair of said side brace members secured to respective opposite ends of a common support shaft, and
   h. said clamp connector assembly mounted about said support shaft to anchor same in an adjusted position about a horizontal axis.

2. An improved projectile return aparatus as described in claim 1, wherein;
   a. said base frame means having a base support assembly secured as by an anchor assembly to said support post assembly,
   b. said base support assembly including a plurality of telescoping leg assemblies having their inner ends

secured to said anchor assembly and the outer ends secured to support cup members operable to contact and grasp the support surface to provide lateral and vertical stability,

c. said support cup members having respective holes in outer flanges to initially contact and subsequently release from the support surface for ease of disconnection for movement to a different location, and

d. said telescoping leg assemblies having release means connected to outer ends thereof movable to engage the support surface to release respective ones of said support cup members therefrom.

3. An improved projectile return apparatus comprising;

a. a backstop means having a return panel member connected to a panel support assembly,

b. a base frame means having attachment means to be releasably connected to a support surface and held against lateral movement,

c. said base frame means including a support post assembly and extended in a plane at an angle relative to the support surface,

d. means adjustably connecting said backstop means to said base frame means whereby said return panel member may be adjusted horizontally and vertically to return a projectile thrown against said panel member at a desired angle and direction, and

e. said base frame means including telescoping leg assemblies with the outer ends having support cup members and having releasable roller assemblies pivotally connected to outer ends of said telescoping leg assemblies movable to engage the support surface to release respective ones of said support cup members therefrom.

* * * * *