



(51) International Patent Classification:

A63B 69/00 (2006.01)

A63B 43/00 (2006.01)

(21) International Application Number:

PCT/AU2023/050479

(22) International Filing Date:

02 June 2023 (02.06.2023)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

2022203879

03 June 2022 (03.06.2022)

AU

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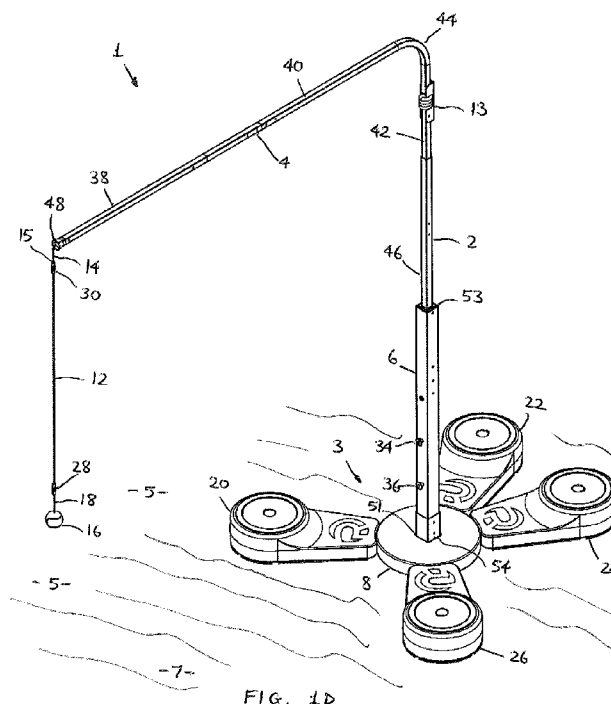
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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CV, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, MG, MK, MN, MU, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

(54) Title: BALL SPORT PRACTICE DEVICE



(57) Abstract: Ball sports practice device (1) including base member (3); upright member (2) securable to the base member (3); transverse member (4) extending from said upright member (2); adjustable line (14) extending from the upright member (2) to the transverse member (4) such that the line (14) protrudes from a free end (48) of the transverse member (4); ball cord (18) attached to a ball (16); attachment cord (12) that attaches to the adjustable line (14) and to the ball cord (18); wherein one of several different types of balls (16) and corresponding ball cords (18) are adapted to be connected to the attachment cord (12), wherein further a user of the device on their own is able to hit, kick, pass or throw a ball (16) and said ball (16) returns to the user after being hit, kicked, passed or thrown.

(84) **Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, CV, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SC, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, ME, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*

BALL SPORT PRACTICE DEVICE

Field of the Invention

This invention relates to a ball sport practice device, more particular to a device that
5 enables a user to practise his or her skills in a particular sports discipline. The device can also be used as a general fitness tool incorporating the use of practicing ball skills.

Background of the Invention

In order for a person to practise a particular ball sport, it is difficult to practise on their
10 own. He or she might have to travel to a venue away from home, such as a tennis court, a football field or a golf course. It might involve having to use a goal structure, as in soccer, Australian Rules football or hockey or the use of a net such as for cricket. This may not be convenient for the person and in some sports it may be beneficial to have another player with that person, which is not always possible. Furthermore, apart from having to go to a particular
15 sports venue, the ball, once kicked or hit is never able to be returned and the user has to retrieve the ball to then go through the practice procedure again.

A number of devices have been previously designed that can be set up in a backyard of a residence where the user lives. Some examples of such devices are described briefly below.

In British Patent No. GB2350568 there is disclosed a golf practice swing or cricket
20 batting practice swing device in which a ball 10 is connected to a line 12 from both sides such that each end of the line 12 is linked to a respective guideway 4. The guideway 4 is upwardly inclined and the initial resting position of the ball is on the ground while the other end of the guideways is attached to a metal frame so that the distal end of the guideways is at a distance above ground, such as 2 metres. The device is designed to practise ball sports in which a ball is
25 hit off the ground with a trajectory at a distance away and at a height above the user, such as golf and cricket. When the user hits the ball, the line 12 moves the ball upwards along each guideway 4 and when the guideway 4 separation distance is too great for the inner elastic line 12, then the ball and the line slow down and eventually stop and are returned by gravity down each guideway 4 to the user.

This device is useful for golf striking and cricket bat striking but no other sport. Furthermore, it does not enable the user to practise other sports where the user handles the ball such as football (Australian Rules Football, Rugby, Gridiron), a cricket ball, tennis ball, or even kicking a soccer ball for example. Furthermore, this device is limited to essentially practice of one action of a user, being a golf swing or cricket bat swing.

In US Patent No. 10,661,149 there is disclosed a projectile tracking system configured to generate tracking data of a projectile which is either thrown or hit by a user and this is done over a selected portion of the trajectory of the projectile. It is designed to provide real time feedback of the trajectory of the user for training purposes. It is used in a number of sports, such as baseball, cricket, hockey, ice hockey, golf, hammer throwing and tennis to name a few sports. However, with this particular device there is no facility to have the ball or projectile returned to the user.

In US Patent Application No. 2019/0358511, there is disclosed a ball which is attached to a flexible stick or pole which in turn is attached to a base unit. The base unit can be supported on the ground or connected to a fence or wall, for example, so that there are two different hitting positions of the ball. Although it does allow for the attachment of different kinds of sports balls to the end of the pole, the pole while being flexible is not adjustable in length. It only suits the hitting of the ball at a distance above the ground and does not enable practice of throwing, kicking or passing.

Canadian Patent No. 2396404 discloses a ball returning apparatus which has a frame open at one end into which a user can kick or throw a ball. The lower portion or floor of the frame is angled so that the ball is returned to the user due to gravity after use. It is said to be applicable for golf driving, kicking a soccer ball or Australian Rules Football, pitching balls as in baseball or softball, or throwing a ball as in cricket, netball or basketball and hitting balls as in hockey and tennis. However, it is restricted in that the user can only kick or throw the ball in one particular direction and that is into the interior of the net framed apparatus. It does not allow a user to run around and practise their passing, throwing or kicking or hitting skills. Furthermore, for a ball toss such as in tennis, it is left to the user to still throw the ball up to hit it with a tennis racquet into the apparatus.

In US Patent Application No. 2012/0283045 there is disclosed a device used to assist in soccer training whereby the user wears apparatus on each leg with each apparatus having a series of holes in which to tie or secure a cord which is also attached to a soccer ball. The user can

practise alternatively kicking the soccer ball on each leg for however long they wish knowing that the elastic cords that hold the ball to each leg will make the ball return once the ball is kicked. This particular apparatus is only specific to the one sport, being soccer, and to one action which is kicking. It also requires the cumbersome attachment and retention of apparatus to each
5 of the individual's legs.

With regard to US Patent No. 10,835,798, it discloses a baseball or a softball training device that has a base and frame body attached to the base and an outwardly extending portion that forms the top of the frame body. The outwardly extending portion has a pair of arms between which is vertically located a ball of a suspension system whereby a ball is held
10 vertically in a tethered arrangement between the upper arm and the lower arm. A user can practise hitting the ball across their body but generally only in a limited number of positions. The ball, being tethered, returns to its original position after it has been hit. It is limited to a number of sports in which it can be used and in the number of actions that can be taken. There is no possibility for throwing, passing or kicking a ball and there are limited positions from which to
15 hit the ball.

With regard to US Patent Application No. 2015/0209644 there is disclosed a tennis training apparatus which is on an adjustable stand, so it can be varied in height. A horizontal bar extends from an upright portion and has a fixed length cord or panel 30 that extends from the end of the horizontal bar. At the end of the panel 30 is attached a tennis ball from which a user can
20 hit the ball. The ball, once hit, is released from its coupling panel 30. It is therefore not a returnable ball.

With regard to US Patent No. 8,784,240, there is disclosed a ball hitting training device whereby a ball used in baseball, softball, cricket, or tennis is detached from an adjustable line from when the ball is hit. It is a T frame with a line that is fed through a cross bar and tied at a
25 peg on an upright bar. In this manner the line is adjustable for whichever sport and the height at which the ball is hit. The patent specifically describes the drawbacks of tethered ball devices in stating that it is not possible to see where a ball ends up, after being hit, and whether it is a good shot / hit or not. The main disadvantage with this device is that it is used by a single person and that person has to go and retrieve all of the balls hit, which takes time and is inconvenient to
30 continuous training.

Other known devices include a badminton shuttlecock hitting device and an A-frame cricket batting practice device where a ball is hit into a goal with a backing net. These only

relate to one type of ball sport. Another arrangement is where a coach hangs a line and a ball attached to the line away from him/her for a sports player to hit, which is not practical and limits the possible movements of the player.

It is desirable to overcome one or more of the above disadvantages with the systems described above by providing a ball sport practice device that can be used for multiple ball sports, can be used by one person and is adapted to improve the skills of the person whether it is hitting a ball, passing, catching or kicking a ball that is returnable.

Summary of the Invention

According to an aspect of the invention, there is provided A ball sports practice device including:

- a base member;
- an upright member securable to the base member;
- a transverse member extending from said upright member;
- an adjustable line extending from the upright member to the transverse member such that the line protrudes from a free end of the transverse member;
- a ball cord attached to a ball;
- an attachment cord that attaches to the adjustable line and to the ball cord;
- wherein one of several different types of balls and corresponding ball cords are adapted to be connected to the attachment cord, wherein further a user of the device on their own is able to hit, kick, pass or throw a ball depending on the type of ball attached to the attachment cord and said ball returns to the user after being hit, kicked, passed or thrown.

The device is preferably portable. The device may further include a first connector for connecting a first end of said attachment cord to the ball cord of the particular ball used by the user and a second connector for connecting a second end of the attachment cord to a first end of the adjustable line that protrudes from the free end of the transverse member.

In an embodiment, the base includes a base support comprising a plate and support bars attached to the plate.

Preferably the base member includes a base support comprising a plate and at least a first member and a second member both attached to said plate with said plate positioned on a ground surface.

5 The ball sports practice device may further include a base unit adapted to fit directly over the plate and a part of either or both of the first and second members. The device may further including a series of footings, with each footing adapted to fit over one of the first member or second member.

10 Each footing may have an interior space adapted to be filled with a substance having weight, such that additional support is provided to the device and prevents the device from becoming unstable. The ball sports practice device may further include a sleeve member hollow at a first end and a second end thereof, such that the first end is fitted to the base member and the second end is adapted to receive a free end of the upright member.

15 The ball sports practice device preferably includes a bracing element connected between the upright member and the transverse member. The transverse member is preferably substantially perpendicular to the upright member in an in-use position. The transverse member is preferably adapted to be detached from the bracing element such that the transverse member can fold downwardly towards the upright member in order to store or move the device.

20 Preferably the device further includes a spring apparatus, forming part of the upright member, such that the transverse member is adapted to move downwardly towards the base member.

25 The free end of the transverse member is preferably outwardly fluted in shape to prevent the adjustable line or the attachment cord wrapping around the transverse member. The adjustable line preferably has a first end protruding from the free end of the transverse member, is contained within each of the transverse member and upright member and has a second end that protrudes from the free end of the upright member.

The second end of the adjustable line preferably extends through an aperture in a sidewall of the sleeve member and is able to be secured to any one of a number of projections on said sleeve member in order for the user to adjust the height of the ball. Preferably the dimensions of the transverse member and upright member are such that the user has a space that allows 360 degree movement and the ball is able to be moved in any direction in a half-spherical volume above the level of the ball in its resting position.

Brief Description of the Drawings

A preferred embodiment of the invention will be hereinafter described by way of example only, with reference to the drawings in which:

Figure 1A is a perspective view from above of a ball sports practice device according to an embodiment of the invention;

Figure 1B is a front view of the device of Figure 1A;

Figure 1C is a side view of the device of Figure 1A;

Figure 1D is a perspective view from above of a ball sports practice device according to a further embodiment of the invention;

Figure 1E is a front view of the device of Figure 1D;

Figure 1F is a side view of the device of Figure 1D;

Figures 2A, 2B and 2C are respectively side, front and perspective views of an attachment cable or cord which is attachable, through a first connector, to a sports ball and through a second connector to an adjustable line which is disposed within a frame of the device;

Figure 3A is a perspective view of the device of Figure 1D showing a transverse member of the device lowered to a position towards a ground surface;

Figure 3B is a side view of the device of Figure 3A;

Figure 3C shows four footings connectable to a base member that forms part of the frame of the device;

Figure 4A is a perspective view of the device of Figure 1D but showing an exploded view of the separate footings and the base member to enable a view of the overall base structure of the device of Figure 1A;

Figure 4B is a side view of the components shown in Figure 4A;

5 **Figure 4C** is a front view of the components shown in Figure 4A;

Figure 4D is a perspective view of the separated footings together with a base unit and base support shown in Figure 4A;

Figure 4E is a side view of the base unit of Figure 4D which attaches to the base member in Figure 4D;

10 **Figure 4F** is a side view of the footings of Figures 3C and 4D;

Figure 4G is a side view of the base member of Figure 4D;

Figure 4H is a perspective view of an alternative base support to that shown in Figure 4D;

15 **Figure 5A** is a perspective view of a female component of a connector, which connector is used to connect one end of the attachment cord or cable respectively to a further cable which is attached to a ball and also is used to attach the other end of the attachment cord or cable to the adjustable line which is fed through part of the frame of the device;

Figure 5B is a front view of the female connector component of Figure 5A;

Figures 5C and 5D are respectively side and end views of the female connector component of Figure 5A;

20 **Figure 6A** is a perspective view of a male connector component adapted to fit to the female connector component of Figure 5A;

Figure 6B is a front view of the male component of Figure 5A;

Figures 6C and 6D are respective side and end views of the male component shown in Figure 6A;

Figure 7A, 7B, 7C and 7D are respectively perspective, front, side and end views of a complete connector comprising the female component shown in Figures 5A to 5D and the male component shown in Figures 6A to 6D;

Figures 8A and 8B are respectively a perspective view and a side view of the complete connector shown in Figures 7A to 7D, with a clamping member for clamping the end of a cord or cable, for example attached to a ball;

Figure 9A is a side view of an attachment cable or cord which is attachable through a first connector to a sports ball and through a second connector to an adjustable line which is disposed within a frame of the device, with enlarged detail of the second connector also provided;

Figure 9B is an enlarged view of the first or second connector shown in Figure 9A;

Figure 9C is an exploded view of the components of the first or second connector of Figure 9A;

Figure 9D is a perspective view of the attachment cable, first connector, second connector and adjustable line shown in Figure 9A.

Detailed Description of the Preferred Embodiments

This invention describes a ball sport practice device 1 which is able to be used in a variety of ball sport applications and actions such as hitting, kicking, throwing or passing. It is applicable to hitting a ball 16 to practise skills in such sports as cricket, tennis, golf, baseball and hockey. It is applicable for kicking and throwing a ball 16 in such sports as soccer, Australian Rules football, rugby and American football. The device of this invention can be used to practise passing to an imaginary or real player, for example, or to receive the ball from another (imaginary or real) player such as in Australian Rules football where it can be caught or handballed, in rugby where it can be caught and passed and also in handball where it can be caught and passed. The device can also be used to practise throwing a ball, such as in cricket or for a ball-toss such as in a tennis serve.

Referring to Figures 1A, 1B and 1C there is shown a ball sport practice device 1 having a frame 9 comprising an upright member 2, a base member 3 and a transverse member 4. The base member 3 is securable to the upright member 2 and attaches to a stand 19. The stand 19 consists of an upright sleeve 6 and the upright member 2. The sleeve member 6 is connectable to a base

unit 8 via a projection 72 (see Figures 4D, G and H) which extends upwardly from the centre of the base unit 8 such that a lower, first end 51 of the sleeve 6 fits over the projection 72 and is connectable thereto, either through an interference fit with the projection 72 or by securing means, such as bolt and nut. The upright member 2 slides into an opposite upper, second end 53
5 at the top of the sleeve 6 and can be secured by securing means to the inside of the sleeve 6, for example by nut and bolt. The upright member 2 consists of two portions 42 and 46 which are able to be secured together, again such as by a nut and bolt. Alternatively, the portions 42, 46 can be telescopic with spring-loaded detents to secure them at one of several positions. The transverse member 4 extends substantially perpendicularly from the upright member 2 in an in-use position, and is also formed in two sections 38 and 40 again secured in such manner as by a
10 nut and bolt, or can be telescopic. The transverse member 4 extends outwardly and away from the upright member 2 and, in this preferred embodiment, extends approximately horizontally outwardly with respect to the vertical upright member 2 and is secured to the upright member 2 through the elbow section 44. A bracing element 10 connects the transverse member 4 to the
15 upright member 2 and is used to provide extra rigidity and strength to the connection of the upright member 2 to the transverse member 4. The base unit 8 is adapted to be connected to up to 4 footings 20, 22, 24 and 26 which will be described in detail with reference to later Figures. Alternatively, the upright member 2 and transverse member 4 can be made of sections that are retractable or telescoping to achieve a desired height or outward extension. Spring rivets could
20 be used to facilitate the adjustment of the length of the transverse member 4 or the height of the upright member 2.

An attachment cable or cord 12 attaches to an adjustable line 14 and a ball cord 18. The attachment cord or cable 12 has connected thereto a first connector 28 at a lower, first end 80 and a second connector 30 at upper, second end 81 of cord 12. The first connector 28 connects to a
25 ball cord or ball cable 18 which is attached to and extends from a ball 16 that is to be hit, kicked, passed, thrown or handballed. The upper, second connector 30 connects to a distal, first end 15 of an adjustable line or cord 14 which protrudes from an outer, free end 48 of the transverse member 4. The proximal end 17 of the cord or line 14 is fed through the hollow interior of the transverse member 4, the elbow 44 and the hollow interior of upright member 2 and through
30 opening or aperture 50 near the top end 53 of the sleeve 6 and terminates in a gripping ring at second end 52. The ring or end 52 is adapted to hook onto any one or more of the projections 32, 34 or 36 located on one side 35 of the sleeve 6. This serves to adjust the amount of the adjustable line 14 that is exposed or extended from the outer end 48 of the transverse member 4. An extra

long line or cable 14 can be used and the excess can be wrapped around any one or more of the projections 32, 34 or 36 or as many other projections as are needed on the sleeve 6.

Referring to Figures 1D, 1E and 1F, there is shown a further embodiment of the ball sport practice device 1 compared to the one shown in Figures 1A, 1B and 1C. Each of the tubes that make up the transverse member 4 and the upright member 2 are square in profile rather than round or circular as in Figure 1A. Instead of having a bracing element 10 as in Figure 1A, the embodiment of Figure 1D includes a spring apparatus 13 formed in an upper portion 42 of the upright member 2. The spring apparatus 13 works as a safety mechanism in that if a person, child or adult, pulls down on the attachment cable or cord 12, including using their whole weight in pulling down the cord 12, then the device 1 is unlikely to topple over in this instance. When the cord 12 is pulled down with greater force than is required to position the ball, which is attached to the end of the cord 12, the transverse member 4, under the action of the spring apparatus 13 will move downwardly towards the base member 3 and towards the ground surface 7 as is shown in Figures 3A and 3B. As the spring apparatus 13 is spring loaded, once the force on the attachment cable 12 is released, the spring apparatus 13 enables the transverse member 4 to resume its original resting and in-use position which is approximately perpendicular to the upright member 2 (as shown in Figure 1D). In this way the person who has used unnecessary force on the cable 12 will not be hurt or injured and the device will not fall over.

The adjustment of the line or cable 14 enables a user to position a ball either on the ground or at a desired height above ground for kicking, passing or hitting or even at a height suitable for practising a serve or overhead smash in tennis.

As an example, a ball 16 can be positioned on the ground for a user to practise such sports as dribbling or kicking a soccer ball, hitting a golf ball or a hockey ball. When dribbling a soccer ball, the adjustable line 14 would be extended out to allow a user to dribble / pass the ball in an area on the ground 7, controlling the ball with both feet and being able to run around in space 5. When using a golf ball, it is generally hit from a stationary standing position of the user and can be placed on a tee or hit off the ground 7. When the user strikes the golf ball, it will return after a number of radial swings of the line 12 or alternatively the user can grab the line 12 to halt its movement to then hit another golf ball. In such sports as hockey, the user can hit a hockey ball from a standing stationary position or flick the hockey ball off the ground 7 as is often performed in hockey, or the user can be moving, such that, after hitting the hockey ball and upon its return to the ground position, the user can time his or her movements to then take

another shot with a hockey stick in any direction. The whole space 5 around the ball 16 can be used by the user to move in and be well clear of the base member 3. Such movement is possible due to the overall length and height of the transverse member 4, which keeps the ball 16 and cord 12 a safe distance from the base member 3.

5 A similar scenario applies when practicing batting in cricket. Generally, the ball is not on the ground to be hit but is directed at a batter by a bowler who bowls the ball to the batter and then the batter plays a particular stroke depending on the position and height of the ball with respect to the batter. Using the device 1, the user in this instance can practise by firstly hitting the cricket ball and then when it returns on a downwards swing toward the ground, the player can
10 move towards the ball and play a particular stroke which would equate to a cover drive or an on drive, for example. This is where the user positions his/her front foot as near to the ball as possible and then plays the stroke with the bat by hitting the ball as it contacts the ground or about to contact the ground. This can be done numerous times in succession.

 The ball 16 can be positioned at a height between, for example, the knees or waist, and
15 the shoulders and even higher in the case of tennis serving by adjusting the line 14 through a gripping ring 52 on the end 17 of line 14 at the sleeve 6, pulling the line 14 so that ball 16 is at the desired height (or on the ground) and then tying the excess line 14 around the projections 32, 34 or 36. Similarly, to extend the line 14 out of end 48 of transverse member 4, the user simply grips and pulls cord 12 to the desired length. As an example, with the tennis ball 16, a user can
20 practise hitting the ball for ground strokes, both forehand and backhand, and when positioned above the head of the user the ball 16 can be used to practise certain tennis shots, for example, an overhead smash. The ball will return after being hit so that the user can either continue hitting ground strokes or stop the ball to then practise a serve or another overhead smash.

 In cricket, for practising other cricket shots, a batter can hit the ball at waist height to
25 practise a back foot drive, a pull stroke or a hook shot, for example. In baseball a user can practise hitting the ball from a standing start, or alternatively on the rebound when the ball swings backwardly toward the user and ends up being at about waist height at the point of impact. In hockey the user can practise stopping a high ball which is approaching him/her with his/her hockey stick. All of this can be done with free movement by the user on the ground
30 surface 7 in the space 5. The part of the line 14 extending out of end 48, as well as the cord 12, will never be able to wrap around the transverse member 4 or get caught up with it due to an outwardly fluted or outwardly turned end 48 of the transverse member 4. In this case the line 14

will simply revolve in circles around the edge of the outer end 48 so that the user is able to continually and freely make strokes, passes, hits or handballs essentially in any direction within a half-spherically shaped volume above the level of the resting position of the ball.

In the case of practicing for rugby, a rugby ball can be placed on the ground in preparation for a conversion kick at goal. The user is able to run in from any direction depending on whether they are left footed or right footed in order to undertake the kick.

For other sports that involve kicking, particularly soccer, a user can practise kicking with the soccer ball on the ground or at a height above the ground and can also practise stopping the ball with their feet, legs, chest and also practise heading which is where a soccer player contacts the ball with their forehead in order to attempt a score at goal or otherwise control the direction of the ball. Again, the soccer player can continue to kick the ball or practise their skills with it on the return of the ball from its extended position after being kicked or headed.

In other sports such as Australian Rules football, rugby, American football as well as handball a user can continuously run around in the space 5 practising passing of a ball or in the case of Australian Rules handballing the ball to an imaginary teammate. The ball will return in different positions and the player can run around in that space and receive the ball on its return and then practise a handball or pass again.

The device can also be used for practising catching (or marking as in Australian Rules football) a ball at various heights and also for sports such as netball and basketball where a player can receive or catch the ball and then pass it onto another imaginary player. This also applies in cricket where a person can practise catching a cricket ball.

The space 5 in which a user can run around in order to hit, kick, pass or catch a ball provides a 360 degree (with respect to the vertical resting position of cord 12) area to practise as well as any angle in a half-dome or hemisphere above the level of the resting position of the ball. The space is made deliberately large to enable such practice and this is created by a large overhang or extension of the transverse member 4, the height of the upright member 2 and that the footings 20 to 26 are a large distance away from where the ball rests (when not impacted by the user).

Referring to Figures 2A, 2B and 2C, there is shown the attachment cord 12 with the first, lower connector 28 and the second, upper connector 30. Attached to the lower connector 28 is a tennis ball 16, through ball cord 18. As mentioned previously, any other ball can be used which

has a ball cord 18 attached to the internal part of the ball 16 so that it cannot be removed from the ball 16. If the ball has a bladder or a central core, the ball end of cord 18 can be attached by a plug to the inside wall of the ball between the bladder and the wall. With reference to the series of drawings in Figures 5A-D, 6A-D and 7A-D, and in particular with reference to Figures 8A and 8B, the distal end of the ball cord 18 is inserted into an interior space of the body 103 of clamping member 100. The distal end of the ball cord 18 will be clamped, fitted, squeezed or wedged by first and second jaw members 101 and 103 that resiliently movable towards and away from each other. A first member 43 of a first (male) component 31 (which is shown in Figure 9C but not shown in Figures 8A or 8B for clarity) of connector 28 or 30 has an internal space into which the clamping member 100 slides. The user grips and pushes the jaw members 101 and 102 towards each other at the same time as inserting the clamping member 100 into the first member 43 which slides over the outer surfaces of the jaw members 101 and 102. This action forces the jaw members 101 and 102 to grip against the distal end of ball cord 18 while at the same time the outer surfaces of the jaw members 101 and 102 have an interference fit against the interior wall of the first member 43. The ball cord 18 then cannot be pulled out. As an alternative to clamping the distal end of ball cord 18, it can be tied or glued to keep it fixed to the connector 28, 30.

A second component, being a female component 29, of the connectors 28 and 30 is shown in Figures 5A to 5D. It is connected to the lower end 80 of attachment cord 12 for connector 28 at end 35 of first component 33 where the cord 12 is fixed, clamped or fitted and resides within the interior part of component 33 at end 35, that is within the body 33. A similar male and female connection arrangement is applicable to connector 30.

The female component 29 of the connector 28 (or 30) is more clearly shown in Figures 5A to 5D and has first component 33 and second component 37. End 39 of component 37 is open and adapted to receive a part of the male component 31 shown in Figures 6A to 6D. Component 31 has a first member 43 and a second member 41 which in turn has a pair of flexible blades or wings 45 and 47 that are connected to support 49. Support 49 is connected to end 53 of first member 43. The second member 41 snap fits into second component 37 of female component 29 which has a pair of openings 55 and 57 into which wings 45 and 47 fit. In other words, as the male second member 41 is inserted into component 37 the wings 45 and 47 bend toward each other to fit within component 37 and then on reaching the openings 55 and 57 spring outwardly to then lock the male component 31 within the female component 29. This provides a secure

connection which is easy to lock and attach a particular ball to be used. The full connection arrangement is shown in Figures 7A to 7D, 8A and 8B.

Referring to Figures 9A to 9D, there is shown details of a further embodiment of a connector which can be used as either the first connector 28 for attachment to a ball cord 18 at a lower end of connector 28 and for attachment to the adjustable cord 12 at an upper end of connector 28. It can also be used as a second connector 30 where at the lower end thereof it is connected to a top part of the cord 12 and an upper part of connector 30 is attached to adjustable line 14.

With regard to the male component 31, a similar description applies in Figure 9C as it does to Figure 6A to 6D. Additional embodiments in Figure 9C show that one of the cords 18, 12 or 14 can be inserted into a peg 105 which resides in component 104 with the pegs having legs 106 and 107 which are resilient. The end of the cord is pushed in between the legs 106 and 107 which clamp against it. The first member 43 then covers the component 104 and abuts against flange 108 to provide the position shown in Figure 9B. The male component 31, with its wings 45 and 47 is inserted into end 39 of the female component 29. The wings initially flex toward each other and then spring out once they reach the openings 55 and 57. This locks the male component 31 to the female component 29. The first component 33 is then fitted over the clamping member 100 such that the jaw members 101 and 102 flex towards each other resiliently as the end 33 is placed over the clamping member 100, to then be in the position shown in Figure 9B, with the jaw members 101, 102 frictionally engaged against the inner surface of end 33. The end 33 then abuts against end 39.

The width, length, density and elasticity of the attachment cord 12 can be varied, or it can be a normal line that does not have any elasticity in it. If for example, a real golf ball is used and not a practice golf ball, then a fast-dissipating energy cord would be needed so that it does not spring back quickly and potentially hit the user. Generally where it is beneficial to practise a sport where the ball springs back to the user quickly, such as in cricket, then cord 12 can be made from elastic material.

Referring to Figures 3C and Figures 4A to 4H the following description applies to the base member 3. The base member 3 includes a base support 64 and a base unit 8, to which footings 20, 22, 24 and 26 are connected. In one embodiment shown in Figure 4H, the support 64, positioned on the ground surface includes a first member 61, a second member 63 and a plate or disc 70. Both members 61 and 63 are attached to plate or disc 70 at elbows 71 and 73 which

lie either side of upright projection 72. The first member 61 comprises support bar 66 and support bar 69 which is at a different angle with respect to the direction in which bar 66 meets the plate 70. The elbow 71 connects the bars 66 and 69 to one another. Each of the bars 66 and 69 terminate at their distal or outer ends in an upturned end 74. Similarly, second member 63 has support bar 67 attached to support bar 68 through elbow 73 with bar 68 being at a different angle to the angle of approach of bar 67 relative to plate 70. Each of the bars 67 and 68 have at an outer upturned end 74 as well. Alternatively, the members 61 and 63 can be formed in a single piece which is bent or splayed outwardly to provide two legs each which support the footings 20, 22, 24 and 26.

10 In a second embodiment shown in Figures 4D and 4G, the base support 64 does not use a first member 61 and second member 63 as in Figure 4H. Instead, each of the support bars 66, 67, 68 and 69 are directly connected to upright projection 72. Each of the bars 66, 67, 68 and 69 are fixed in length but can be made to be adjustable in length whereby each of them can be telescopic with respect to corresponding bars 75, that are affixed or welded to plate 70. Each bar 15 66 to 69 can be adjusted in length through spring-loaded pop-up rivets that secure a respective bar 75 to any of the bars 66 to 69.

Each of the footings 22 to 26 have, in an underneath part, an indentation or channel 62 that extends essentially along the entire length (see Figures 4A and 4D). This fits directly onto one of the bars 66, 69, 67 or 68. The upturned ends 74 fit within a slot underneath portion 58 of each footing 20 to 26 beneath and in line with opening 60, which is located on the top of portion 20 58. Opening 60 is designed to enable the entry of sand or water, up to 10 kilograms in weight, in order to weigh down each of the footings 20 to 26 so that it provides a stable base for the whole device 1. There is a lower, flatter portion 56 of the footings 20 to 26 which is designed to essentially be level with the top of the base unit 8. The framework of the base member 64 25 provided by first member 61 and second member 63 gives a solid connection for each of the footings 20 to 26. The upright projection 72, on its own (Figure 4D), or may receive (Figure 4H) a short hollow square tube 54 (Figure 3B) which are both designed to receive aperture 78 (Figure 4D) of the base unit 8 and small indentations 76 in the base plate 8 fit over the respective bars 66 to 69. This arrangement is shown in Figure 3A. The bottom end 51 of the sleeve 6 can fit into the 30 tube 54 and can be secured to the tube 54 or have an interference fit with tube 54. Alternatively, where tube 54 is not required, the bottom end 51 of the sleeve 6 can fit into the upright projection 72.

Such an arrangement makes the device 1 wholly portable, where the device 1 can be packed up, handled, transported and/or moved to a different location or stored in a different location. The transverse member 4 can be dislodged so that it swings downwardly against and be parallel to the upright member 2. This is done by releasing it from a top portion 82 of the bracing element 10 (where the top portion 82 may be connected to the transverse member 4 by nut and bolt), with bracing element 10 being able to pivot about its connection point 11 to the upright member 2. Alternatively, the connection point 11 is a prong that can be released or pulled out by a user so that transverse member 4 folds down towards and against upright member 2, when the device 1 in not used, is to be stored or moved to a different location. Elbow 44 can be flexible or can otherwise rotate to accommodate the downward movement of the transverse member 4 towards the upright member 2. Then each of the footings 20, 22, 24 and 26 are disengaged from the base member 64 and carried separately to wherever they need to be located. The remainder of the unit can then be carried to the same location.

The device 1 need not be portable and can be fixed solidly in the ground, such as in a playground, basketball court or tennis court or similar area in a park or school. In this case the base member 64, the base unit 8 and the footings 20 to 26 would not be required. The sleeve 6, or a similar partially hollow upright post, would be fixed permanently into the ground such as by a concrete footing which would serve as a fixed base member, which still allows the upright member 2, the transverse member 4 as well as the cord 12 and line 14 to be moved if needed from the sleeve 6, when the device is not use for an extended period of time.

It is possible for some sports ball applications that two users can use the device 1 at the same time with just one ball. For example, two users can practise passing a ball, having a rally in tennis and practise throwing and catching.

Most components of the device 1 can be made from steel, such as stainless steel, apart from cord 12 and line 14 (nylon). Connectors 28, 30 could be made from steel or plastics material, while footings 20 to 26 and base unit 8 are preferably made from plastics material.

Device 1 provides a single user with opportunities to practise techniques in one or more ball sports of his/her choice in a convenient location, without the need to fetch a ball. The user can simply disconnect and connect any ball, with a ball cord, of their choosing and spend as much time as he/she needs. The user is able to move in a large space practising his/her technique with movement of the particular ball allowed in a hemispherical space above the level of the ball in its resting position. The device is generally portable but can be a fixed installation if required

CLAIMS:

1. A ball sports practice device including:
 - a base member;
 - an upright member securable to the base member;
 - 5 a transverse member extending from said upright member;
 - an adjustable line extending from the upright member to the transverse member such that the line protrudes from a free end of the transverse member;
 - a ball cord attached to a ball;
 - an attachment cord that attaches to the adjustable line and to the ball cord;
 - 10 wherein one of several different types of balls and corresponding ball cords are adapted to be connected to the attachment cord, wherein further a user of the device on their own is able to hit, kick, pass or throw a ball depending on the type of ball attached to the attachment cord and said ball returns to the user after being hit, kicked, passed or thrown.
- 15 2. The ball sports practice device according to claim 1 such that the device is portable.
3. The ball sports practice device according to claim 1 or claim 2 further including a first connector for connecting a first end of said attachment cord to the ball cord of the particular ball used by the user and a second connector for connecting a second end of the attachment cord to a
20 first end of the adjustable line that protrudes from the free end of the transverse member.
4. The ball sports practice device according to any one of the previous claims wherein the base member includes a base support comprising a plate and support bars attached to the plate.
- 25 5. The ball sports practice device according to any one of claims 1 to 4 wherein the base member includes a base support comprising a plate and at least a first member and a second member both attached to said plate with said plate positioned on a ground surface.
6. The ball sports practice device according to claim 5 wherein the base member further
30 includes a base unit adapted to fit directly over the plate and a part of either or both of the first and second members.
7. The ball sports practice device according to claim 6 further including a series of footings, with each footing adapted to fit over one of the first member or second member.

8. The ball sports practice device according to claim 7 wherein each footing has an interior space adapted to be filled with a substance having weight, such that additional support is provided to the device and prevents the device from becoming unstable.

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9. The ball sports practice device according to any one of the previous claims further including a sleeve member hollow at a first end and a second end thereof, such that the first end is fitted to the base member and the second end is adapted to receive a free end of the upright member.

10

10. The ball sports practice device according to any one of the previous claims wherein the transverse member is substantially perpendicular to the upright member in an in-use position.

11. The ball sports practice device according to any one of the previous claims further including a bracing element connected between the upright member and the transverse member.

12. The ball sports practice device according to claim 11 wherein the transverse member is adapted to be detached from the bracing element such that the transverse member folds downwardly towards the upright member in order to store or move the device.

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13. The ball sports practice device according to any one of claims 1 to 10 further including a spring apparatus forming part of the upright member, such that the transverse member is adapted to move downwardly towards the base member.

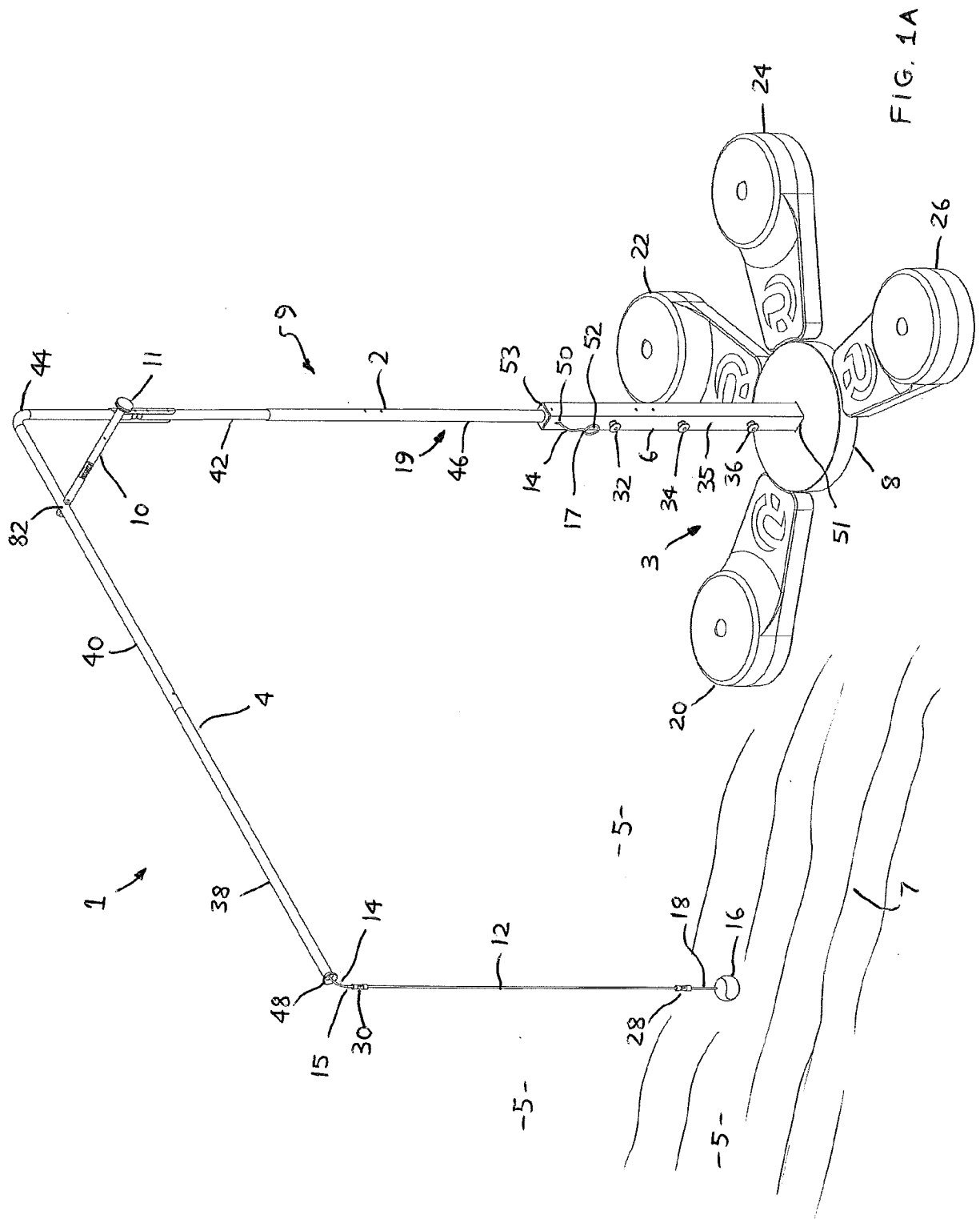
14. The ball sports practice device according to any one of the previous claims wherein the free end of the transverse member is outwardly fluted in shape to prevent the adjustable line or the attachment cord wrapping around the transverse member.

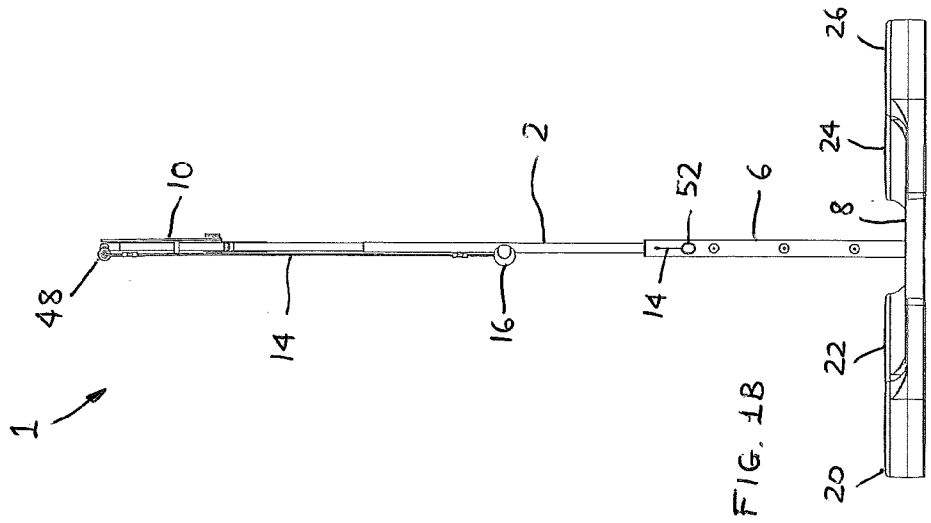
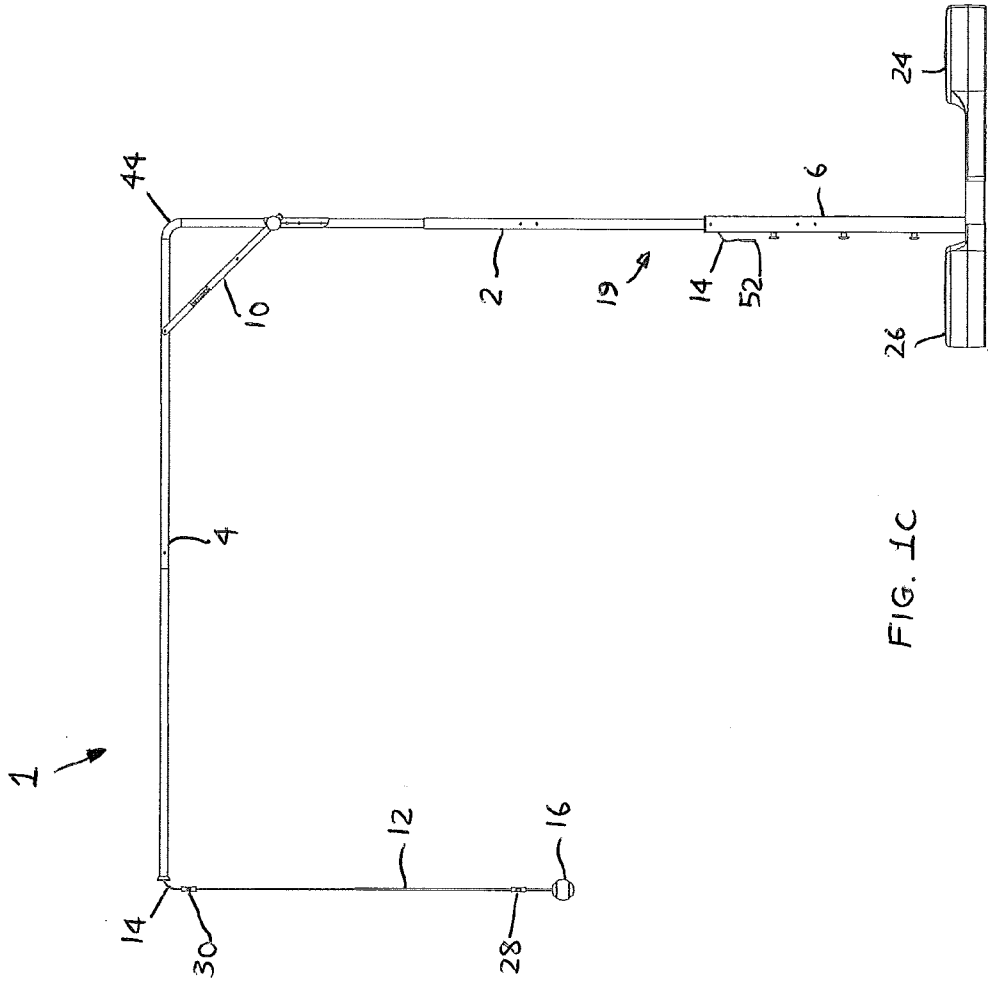
15. The ball sports practice device according to any one of the previous claims wherein the adjustable line has a first end protruding from the free end of the transverse member, is contained within each of the transverse member and upright member and has a second end that protrudes from the free end of the upright member.

16. The ball sports practice device according to claim 15 wherein the second end of the adjustable line extends through an aperture in a sidewall of the sleeve member and is able to be

secured to any one of a number of projections on said sleeve member in order for the user to adjust the height of the ball.

17. The ball sports practice device according to any one of the previous claims wherein the
5 dimensions of the transverse member and upright member are such that the user has a space that allows 360 degree movement and the ball is able to be moved in any direction in a half-spherical volume above the level of the ball in its resting position.





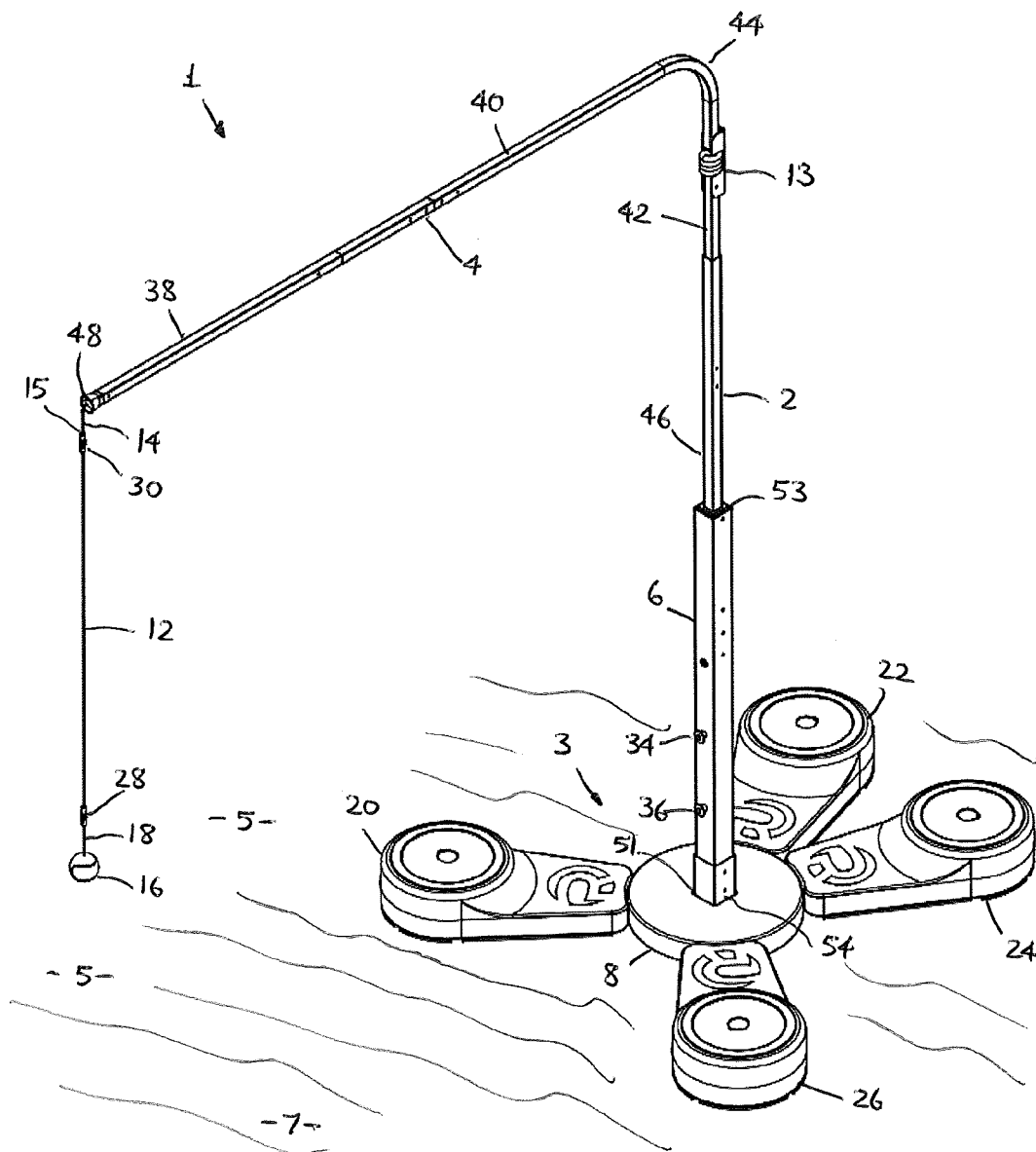


FIG. 1D

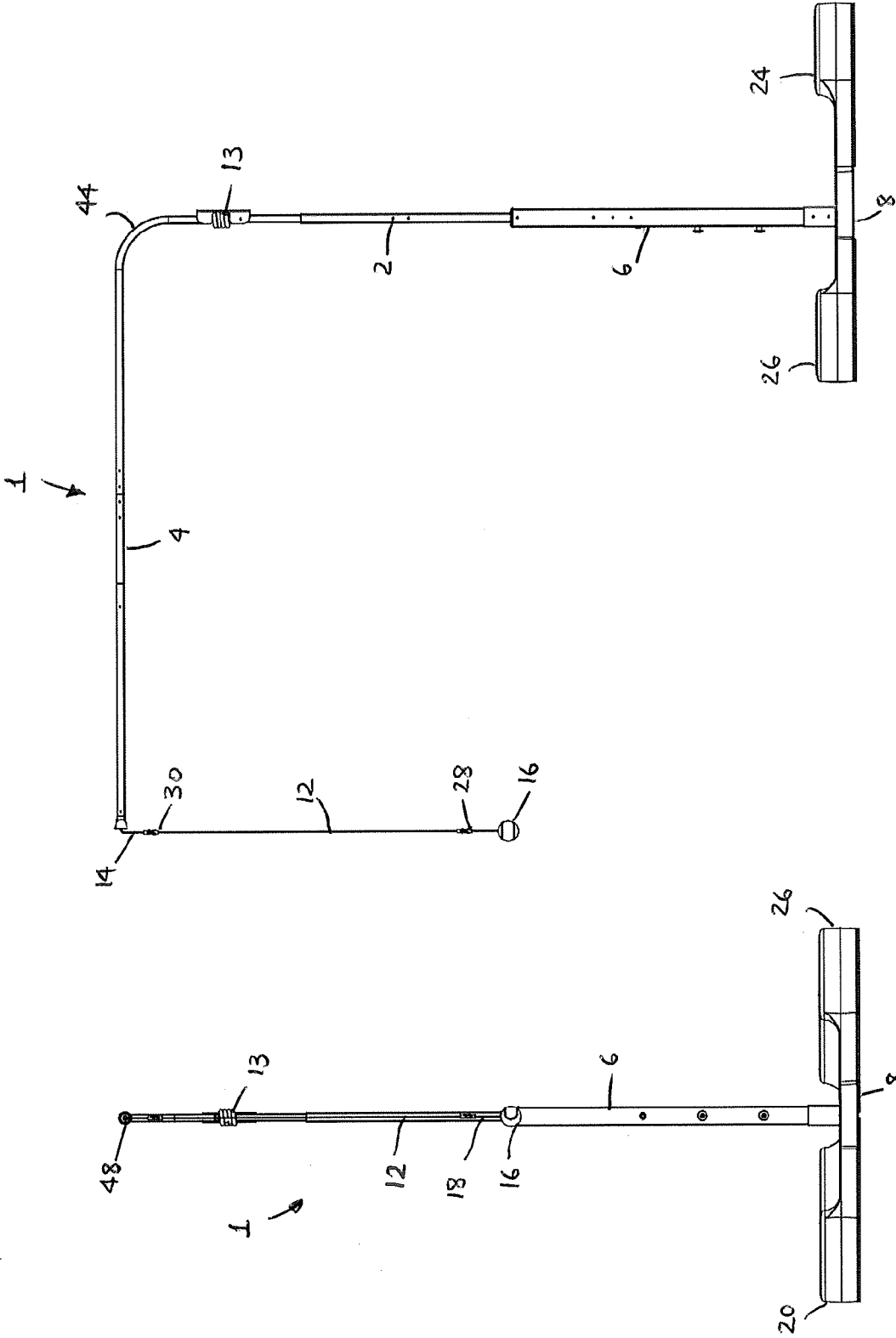


FIG. 1F

FIG. 1E

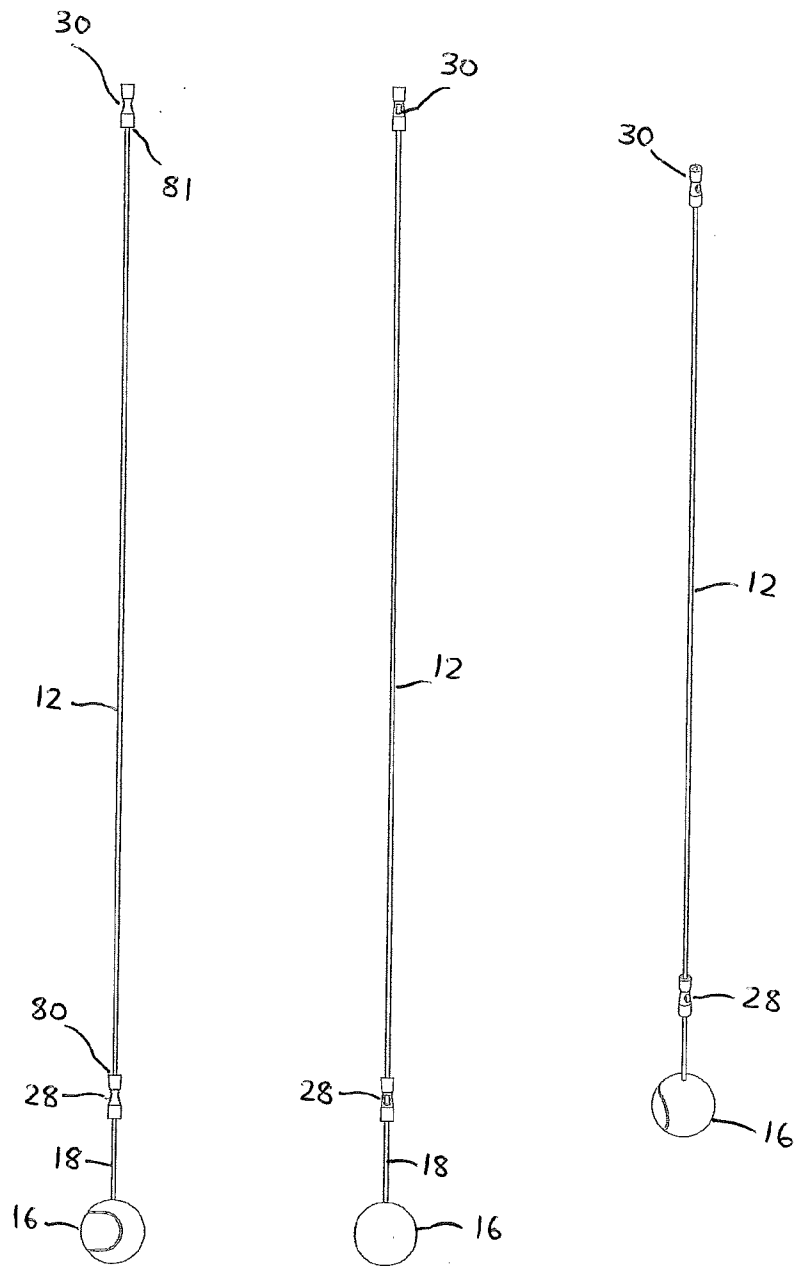
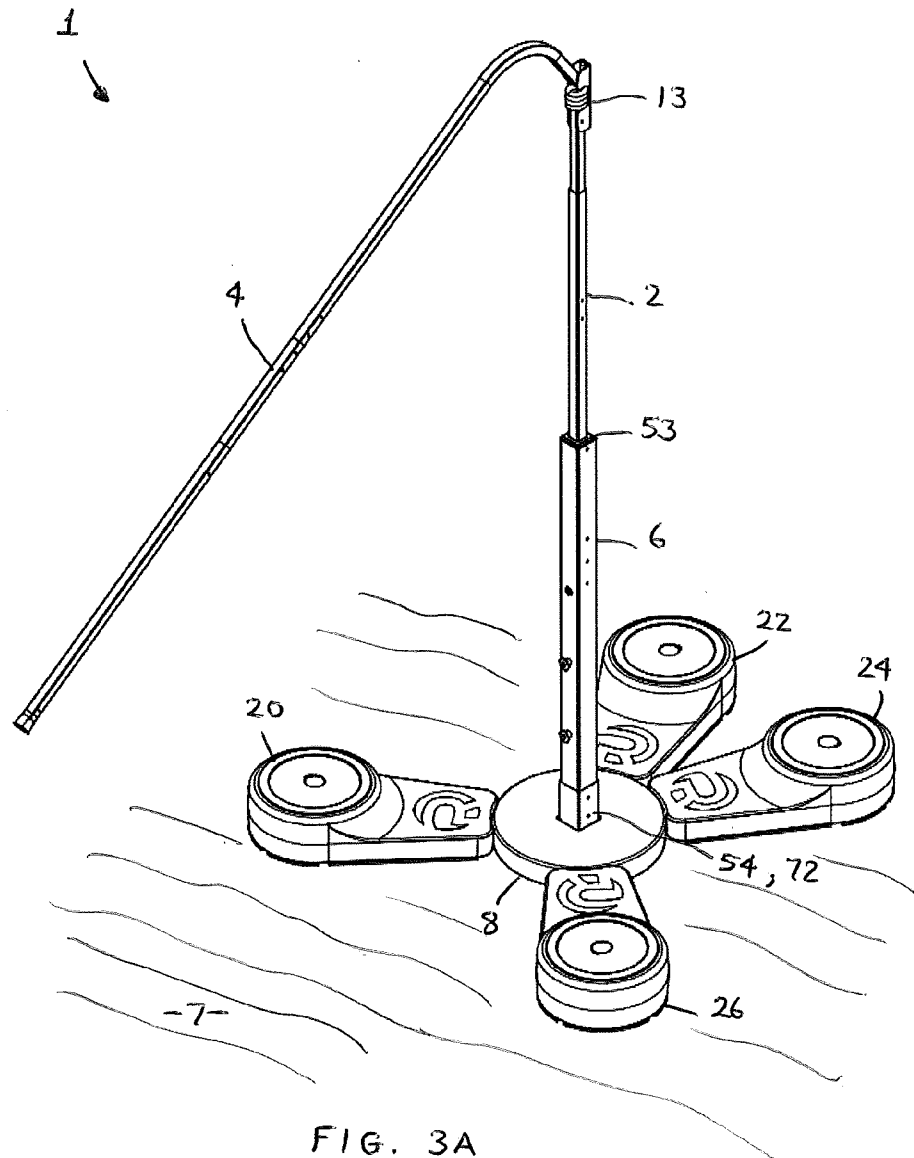


FIG. 2A

FIG. 2B

FIG. 2C



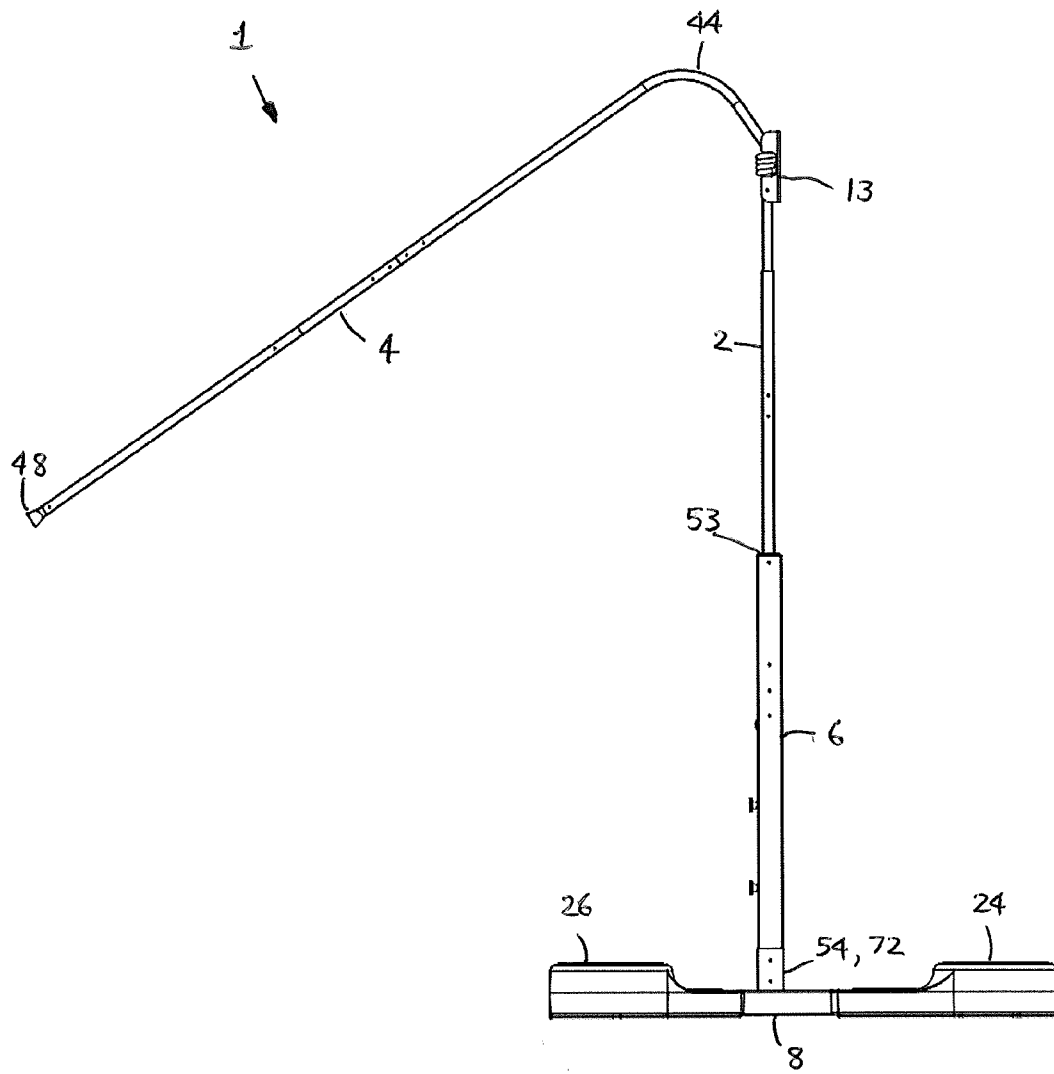


FIG. 3B

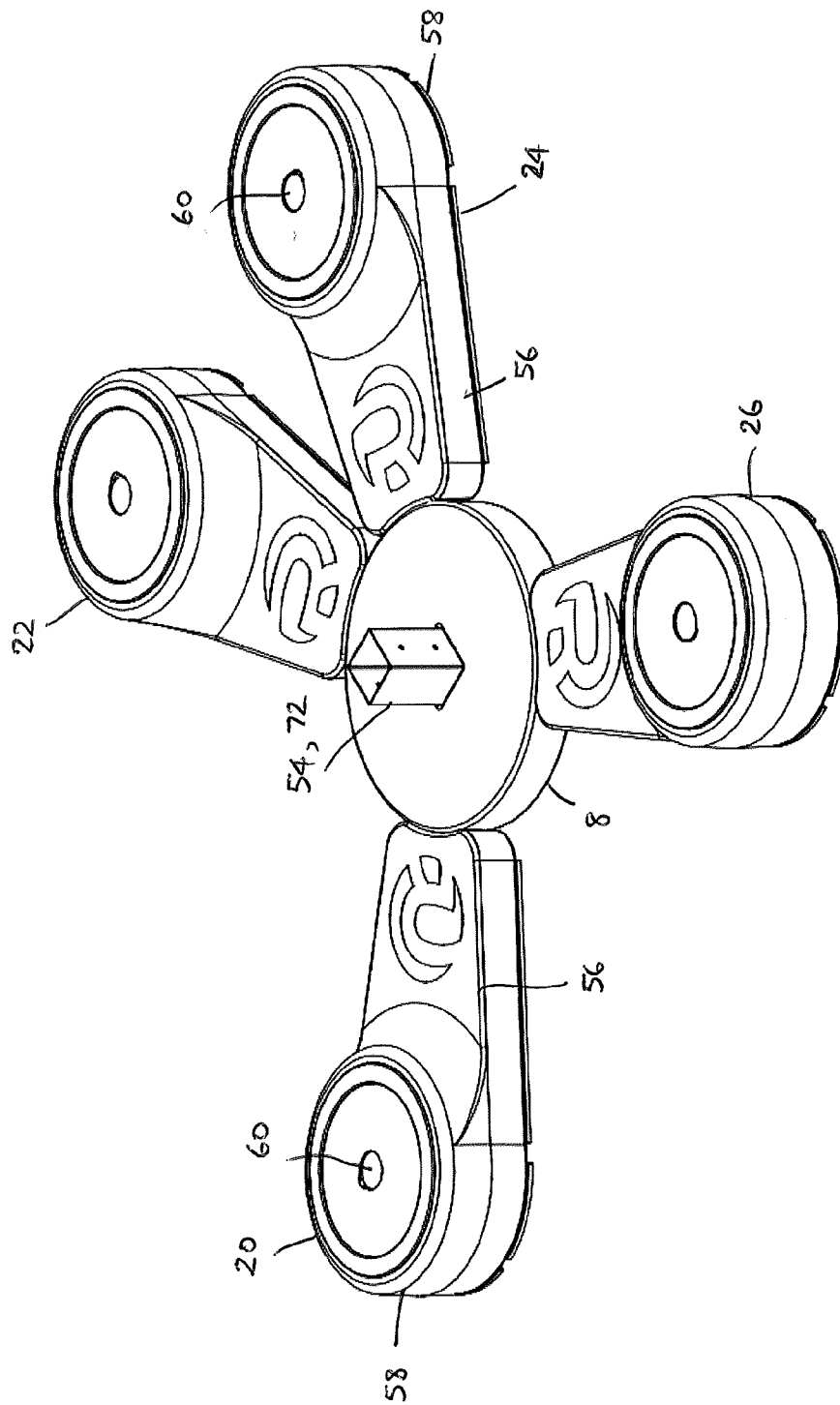


FIG. 3C

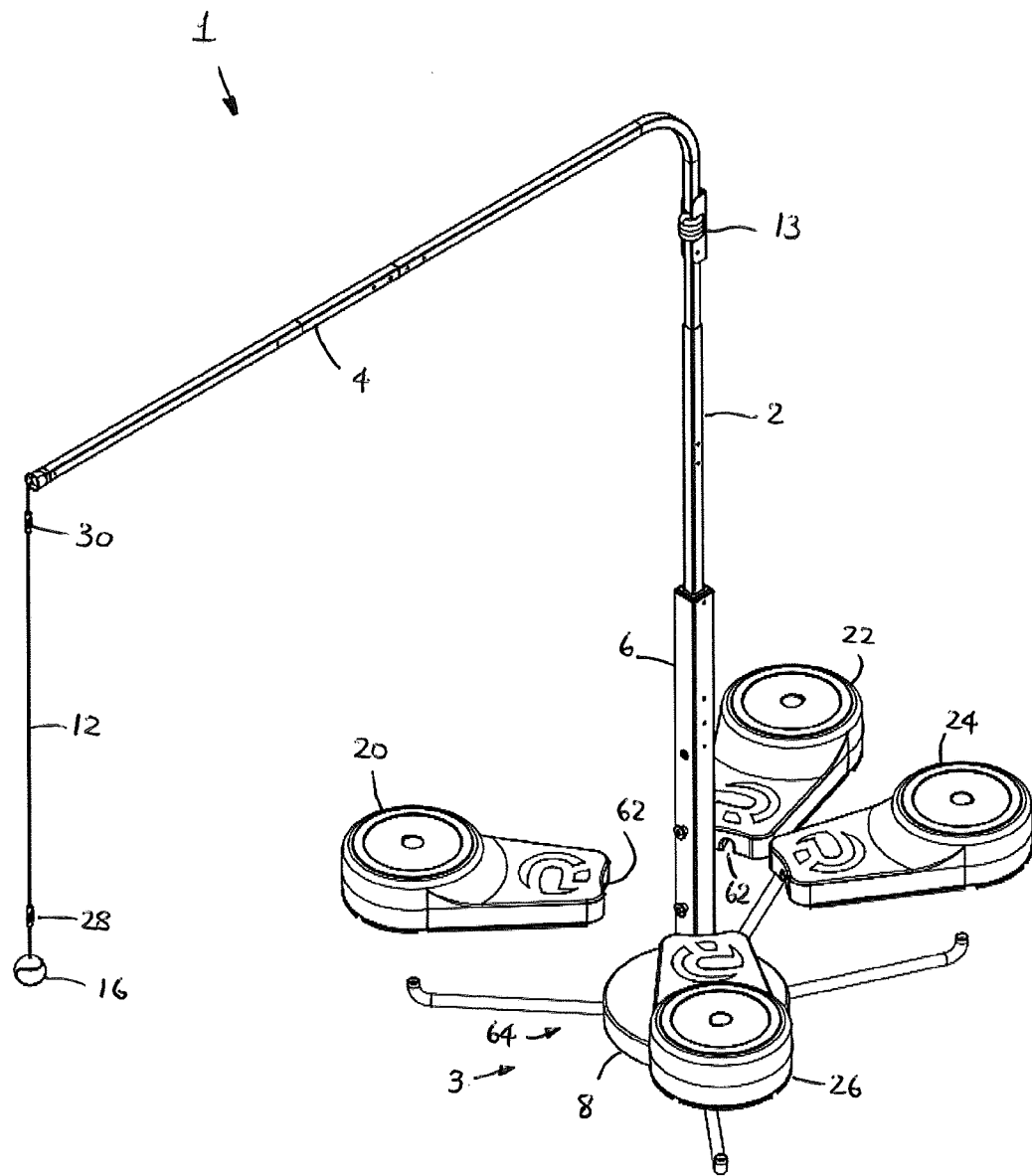
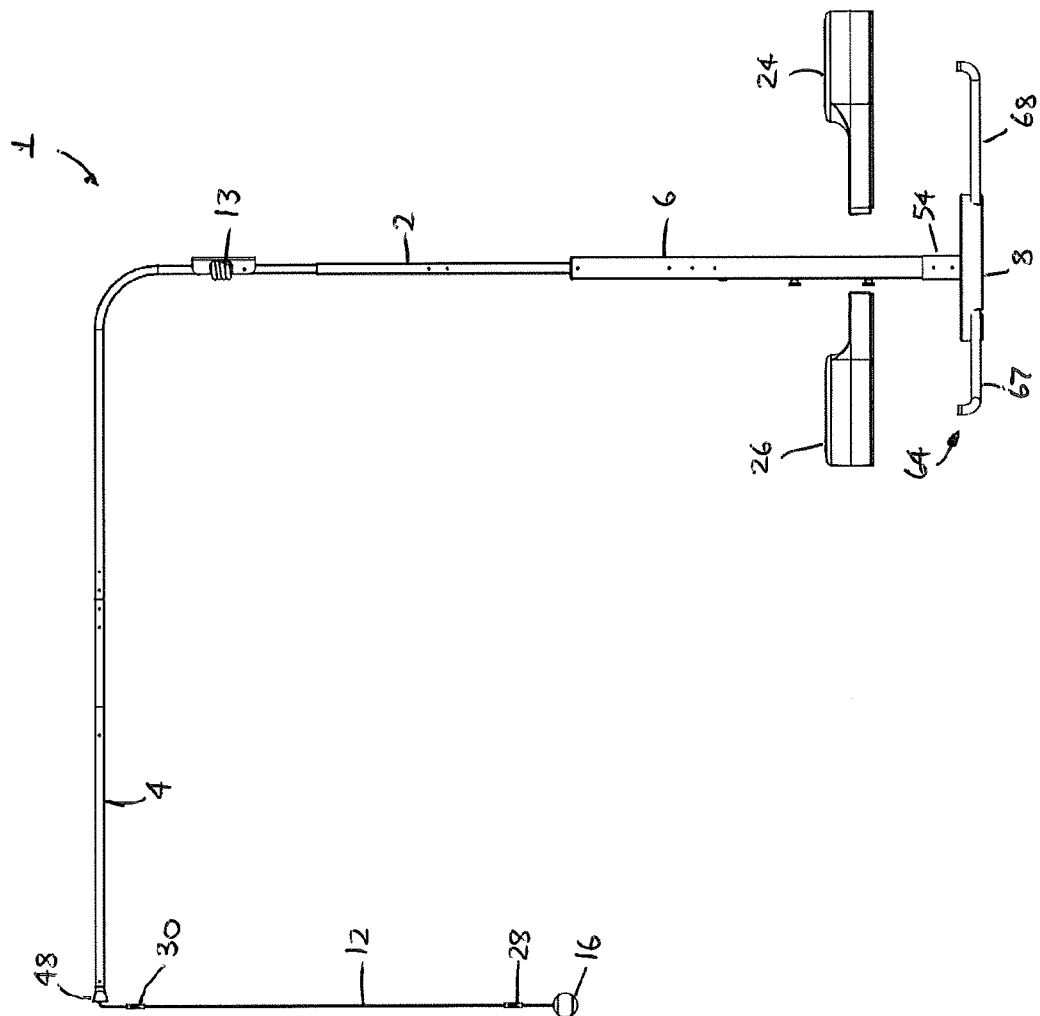
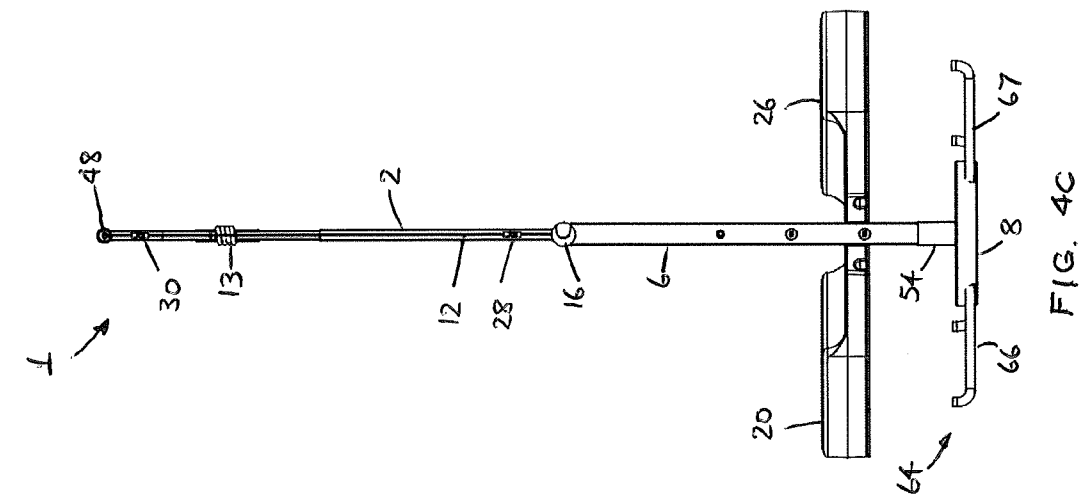


FIG. 4A



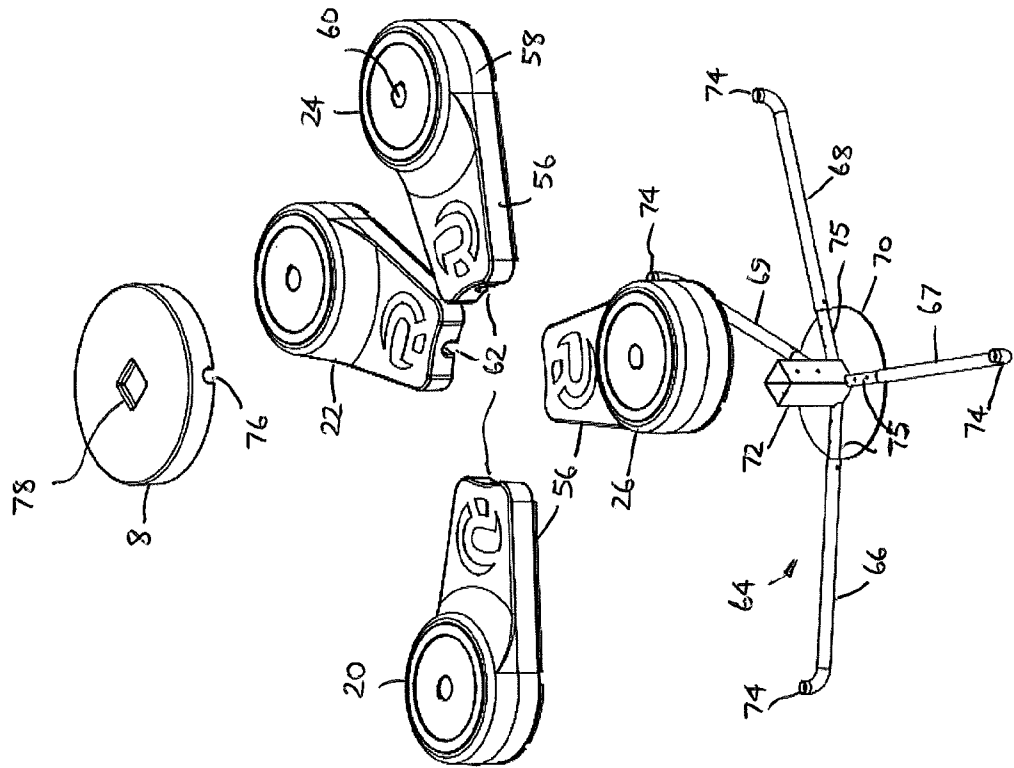


FIG. 4D

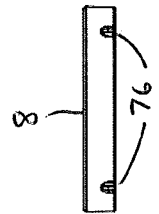


FIG. 4E

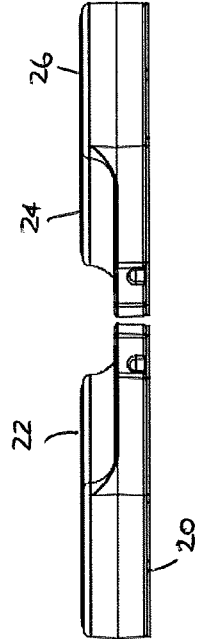


FIG. 4F

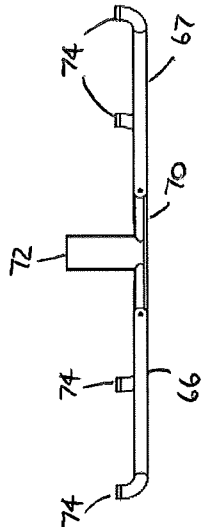


FIG. 4G

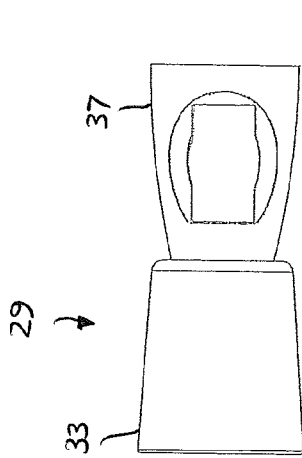


FIG. 5B

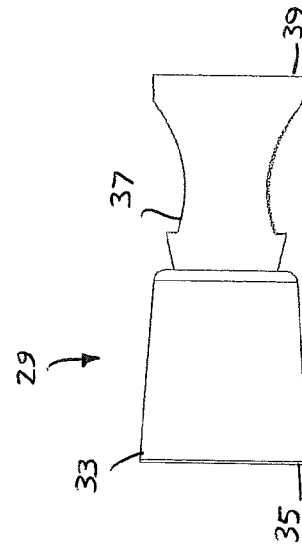


FIG. 5C

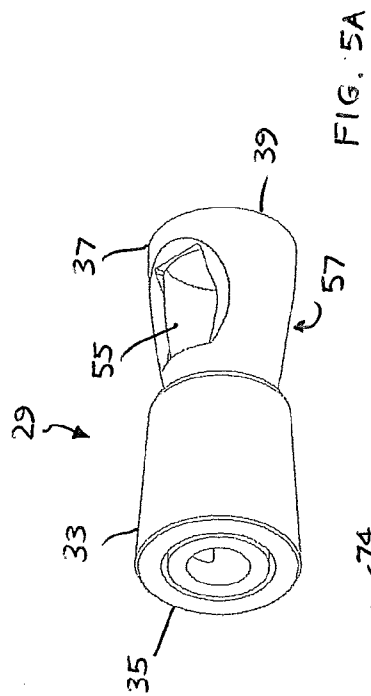


FIG. 5A

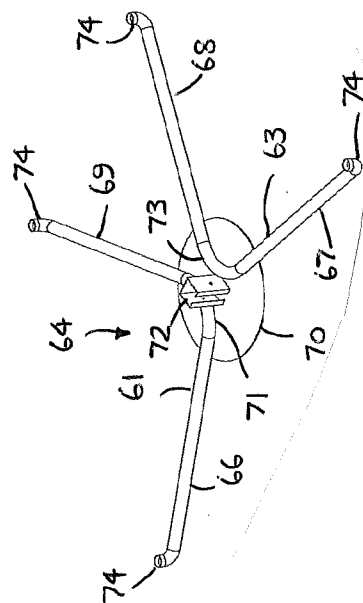


FIG. 4H

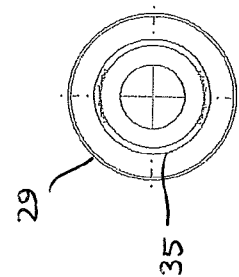
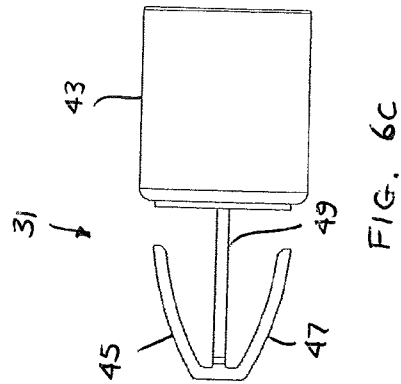
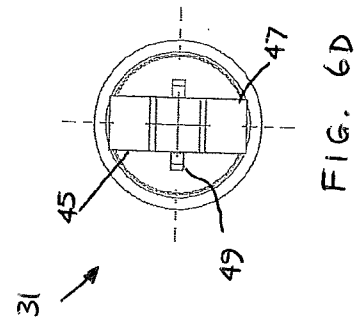
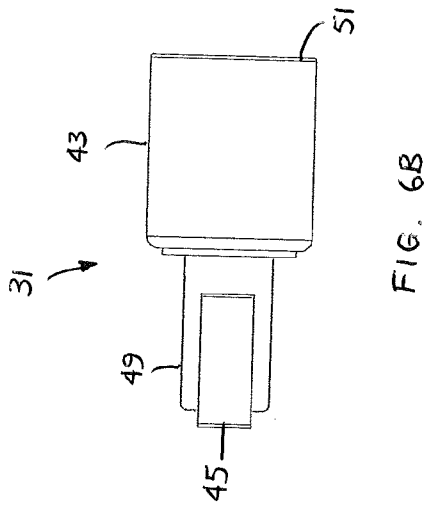
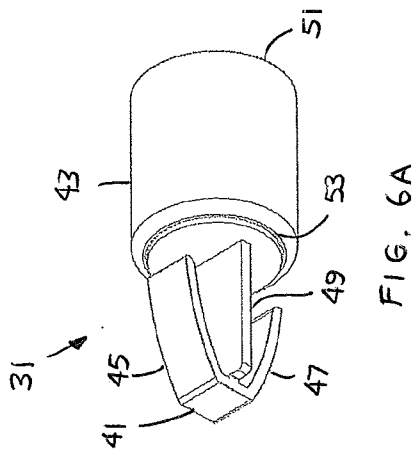
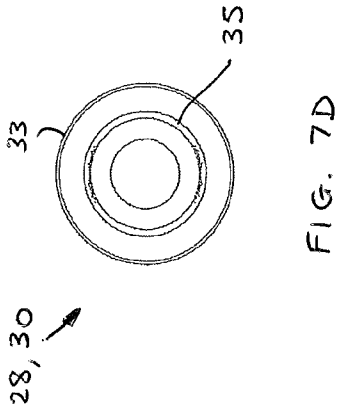
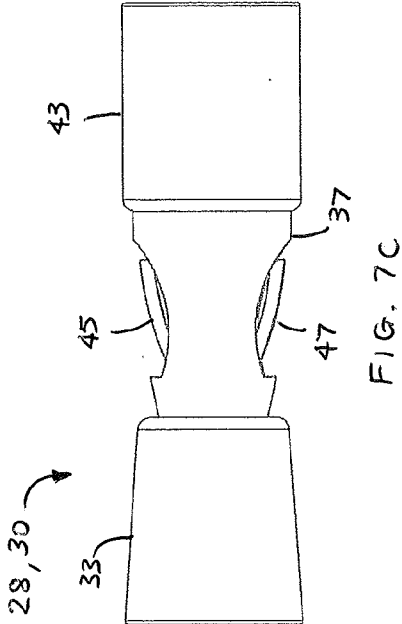
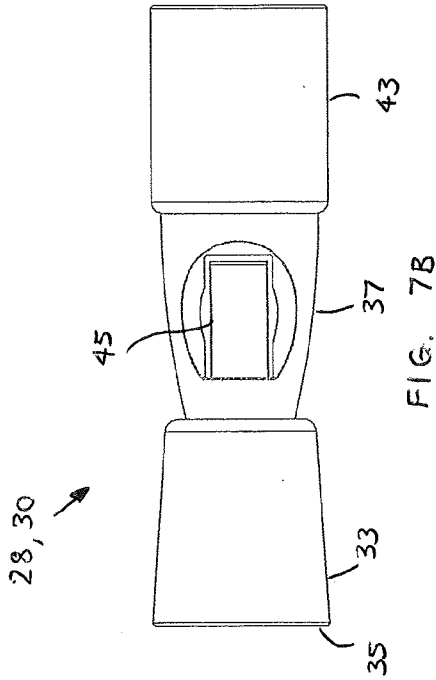
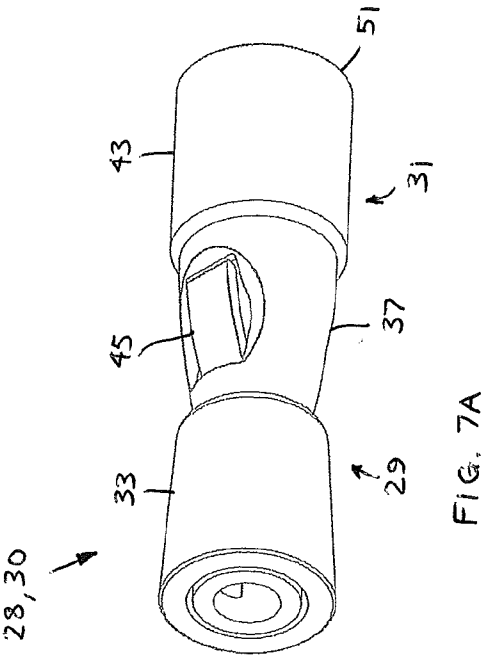
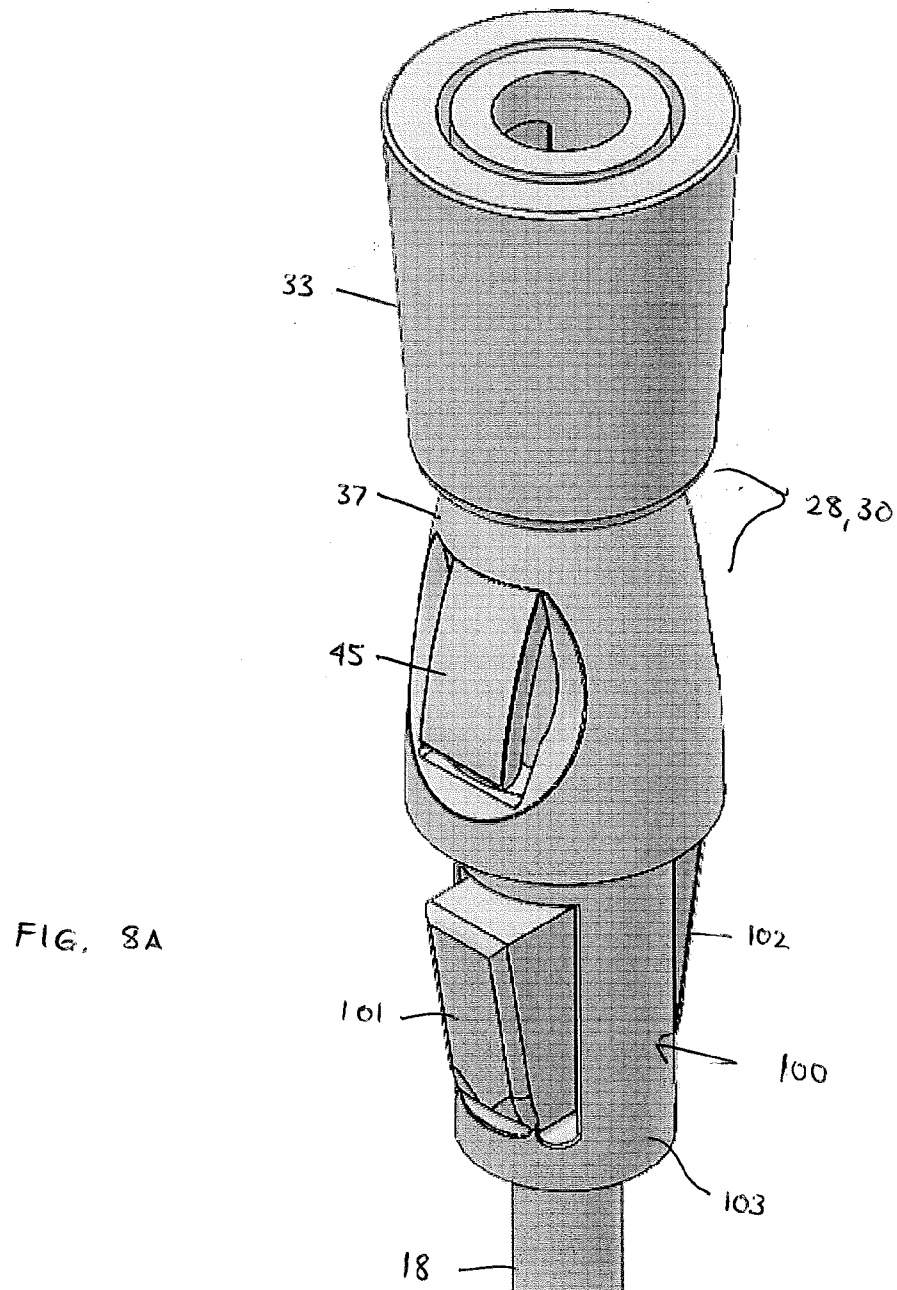


FIG. 5D







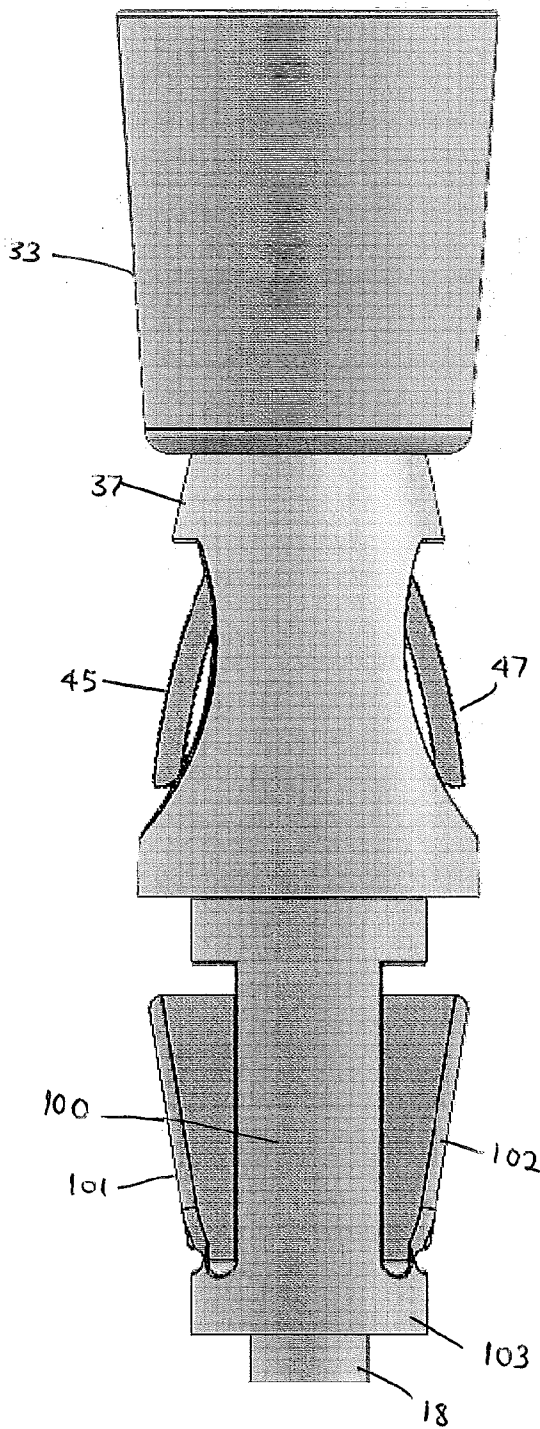


FIG. 8B

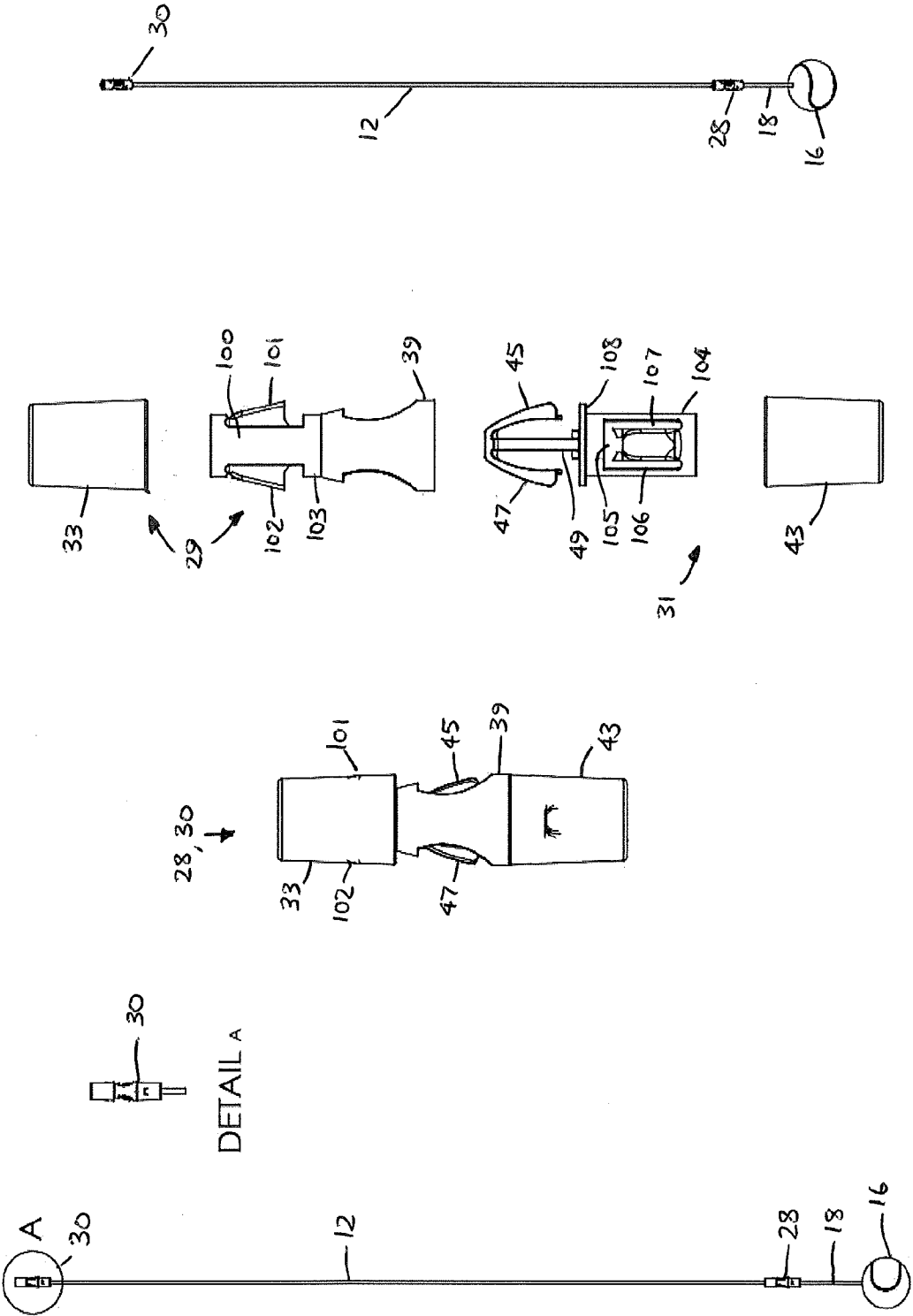


FIG. 9D

FIG. 9C

FIG. 9B

FIG. 9A

INTERNATIONAL SEARCH REPORT

 International application No.
PCT/AU2023/050479

A. CLASSIFICATION OF SUBJECT MATTER

A63B 69/00 (2006.01) A63B 43/00 (2006.01)

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)

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

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

WPI, EPODOC, Google, Google Patents: Keywords (ball, hit, practice, cord, hang, base and like terms)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	Documents are listed in the continuation of Box C	

☒ Further documents are listed in the continuation of Box C

☒ See patent family annex

* Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"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
"D" document cited by the applicant in the international application	"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
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

 Date of the actual completion of the international search
 31 August 2023

 Date of mailing of the international search report
 31 August 2023

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INTERNATIONAL SEARCH REPORT		International application No.
C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		PCT/AU2023/050479
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 7959527 B1 (PITRE) 14 June 2011 Figs 1-7; col 1 lines 48-51; col 2 lines 60-67	1-17
X	US 4576379 A (JUHASZ) 18 March 1986 Fig 1; col 2 line 5-18; col 4 lines 2-3; col 5 lines 1-16	1-17
X	US 6099419 A (INCAUDO et al.) 08 August 2000 Figs 1-3 and 7A-7C	1-17
X	WO 2001/010515 A1 (SOLID CONTACT BASEBALL, INC) 15 February 2001 Figs. 1-6	1-17
X	US 5282615 A (GREEN et al.) 01 February 1994 Figs 1-5	1-17
X	WO 2022/039443 A1 (KANG) 24 February 2022 Figs 1-3	1-17
A	US 2014/0315662 A1 (BUONO et al.) 23 October 2014	

Form PCT/ISA/210 (fifth sheet) (July 2019)

INTERNATIONAL SEARCH REPORT		International application No.	
Information on patent family members		PCT/AU2023/050479	
This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.			
Patent Document/s Cited in Search Report		Patent Family Member/s	
Publication Number	Publication Date	Publication Number	Publication Date
US 7959527 B1	14 June 2011	US 7959527 B1	14 Jun 2011
US 4576379 A	18 March 1986	US 4576379 A	18 Mar 1986
US 6099419 A	08 August 2000	US 6099419 A	08 Aug 2000
WO 2001/010515 A1	15 February 2001	WO 0110515 A1	15 Feb 2001
		AU 6610800 A	05 Mar 2001
		AU 765813 B2	02 Oct 2003
		BG 106425 A	30 Sep 2002
		BR 0013091 A	30 Apr 2002
		CA 2380743 A1	15 Feb 2001
		CN 1374878 A	16 Oct 2002
		EA 200200231 A1	29 Aug 2002
		EA 003178 B1	27 Feb 2003
		EP 1206305 A1	22 May 2002
		HU 0202445 A2	28 Nov 2002
		JP 2003506167 A	18 Feb 2003
		JP 2010155167 A	15 Jul 2010
		KR 20020043550 A	10 Jun 2002
		MX PA02001318 A	16 Jul 2004
		PL 353951 A1	15 Dec 2003
		US 2003064836 A1	03 Apr 2003
		US 6729978 B2	04 May 2004
		US 6790150 B1	14 Sep 2004
		US 2005288127 A1	29 Dec 2005
		US 7198579 B2	03 Apr 2007
		US 2004176191 A1	09 Sep 2004
		YU 8102 A	12 Mar 2004
		ZA 200200837 B	26 Mar 2003
US 5282615 A	01 February 1994	US 5282615 A	01 Feb 1994
WO 2022/039443 A1	24 February 2022	WO 2022039443 A1	24 Feb 2022
		US 2023149790 A1	18 May 2023
US 2014/0315662 A1	23 October 2014	US 2014315662 A1	23 Oct 2014
		US 8585516 B1	19 Nov 2013
		US 8784240 B1	22 Jul 2014
		US 2014213392 A1	31 Jul 2014
Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.			
Form PCT/ISA/210 (Family Annex)(July 2019)			

INTERNATIONAL SEARCH REPORT Information on patent family members		International application No. PCT/AU2023/050479	
This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.			
Patent Document/s Cited in Search Report		Patent Family Member/s	
Publication Number	Publication Date	Publication Number	Publication Date
End of Annex			
Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001. Form PCT/ISA/210 (Family Annex)(July 2019)			