United States Patent

Kelly

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[45] **Dec. 26, 1972**

[54] ARTICLE RETRIEVING APPARATUS

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[52] **U.S. Cl.**.....**242/54,** 242/84.1 A, 242/84.21 A, 242/84.2 B, 242/85, 242/106

[51] **Int. Cl.** **B65h 75/00,** A01k 89/00

[58] **Field of Search** ...242/84.21 A, 84.2 A, 54, 86.5, 242/85, 84.2 B, 84.2 R, 106

[56] **References Cited**

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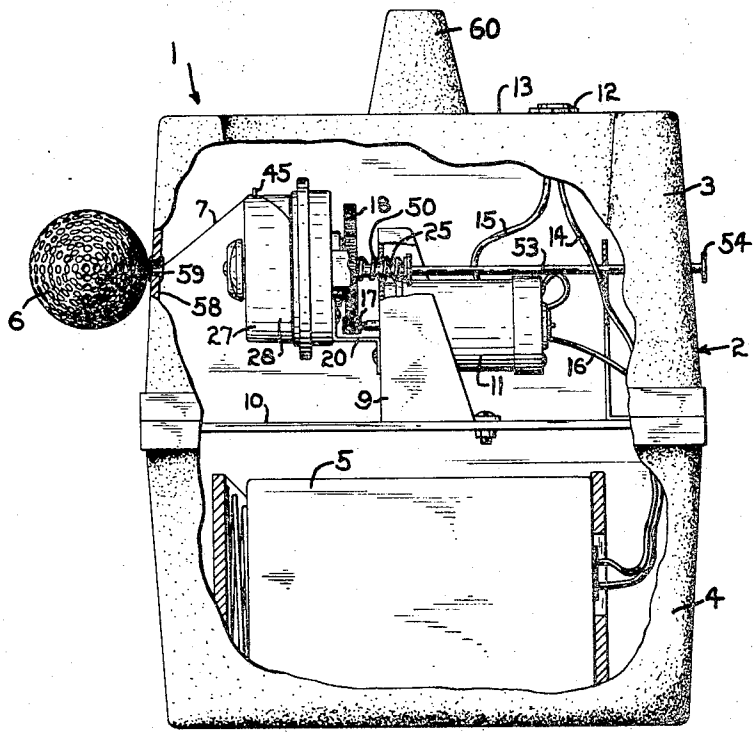
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[57] **ABSTRACT**

A portable article retrieving apparatus is enclosed within a housing having a base member mounted therein with a frame upstanding from the base member and a storage bobbin sleeved on a shaft which is rotatably mounted on the frame and rotated in response to activation of power means. A flexible member has an article to be retrieved affixed to one end thereof and the other end affixed to the bobbin. Bobbin positioning means are operatively connected to the bobbin to position same to receive an intermediate portion of the flexible member in response to rotation of the shaft for winding the flexible member around the bobbin and means operated from outside the housing for allowing substantially drag-free unwinding of the flexible member therefrom.

3 Claims, 11 Drawing Figures



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SHEET 1 OF 5

Fig. 1.

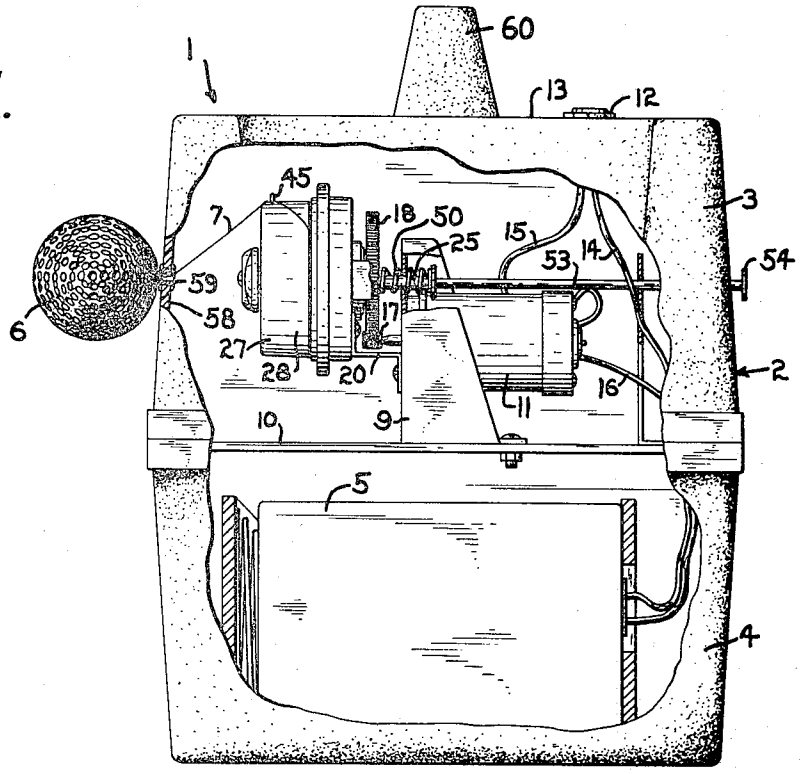
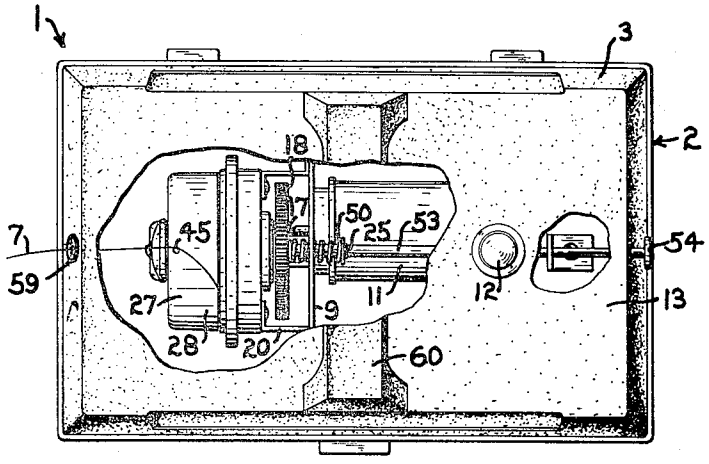


Fig. 2.



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Fig. 3.

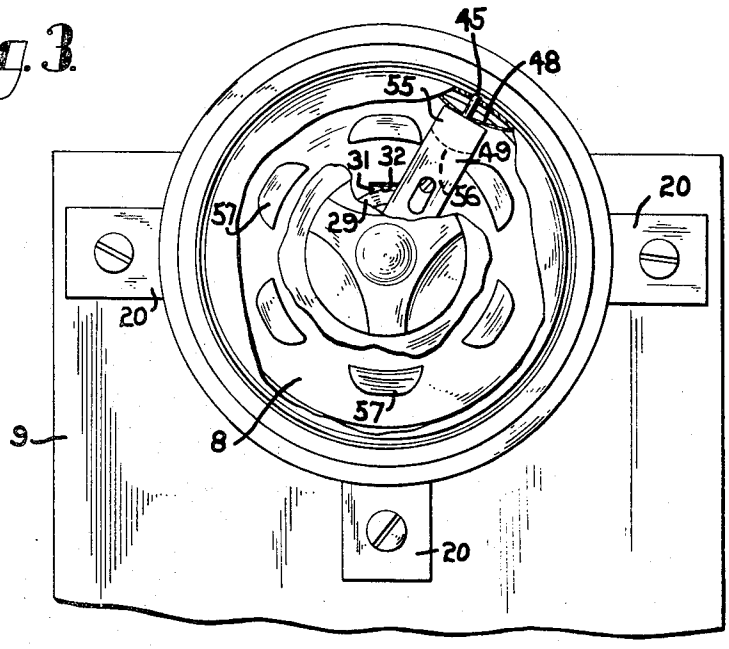
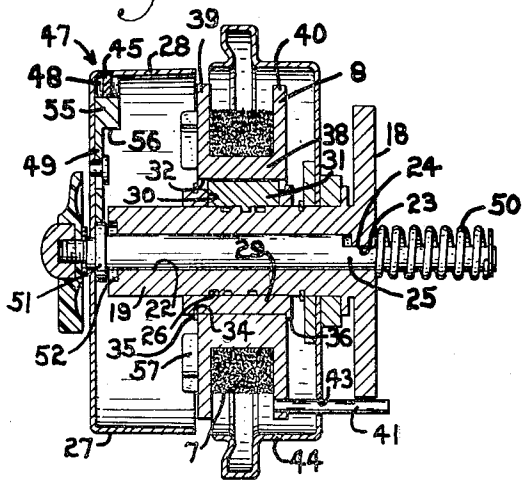


Fig. 4.



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Fig. 5.

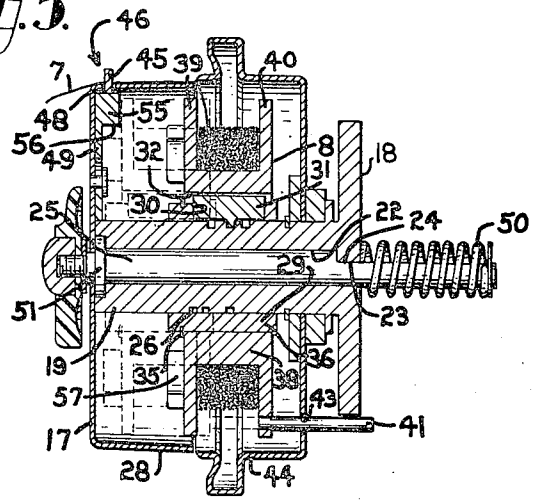
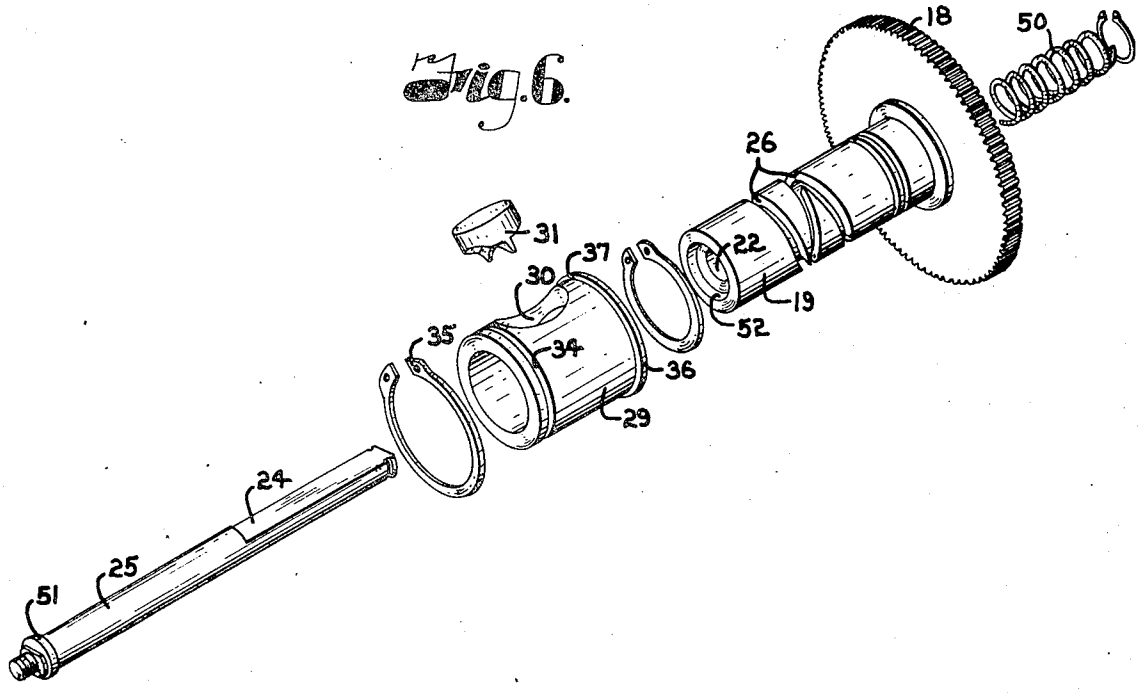


Fig. 6.



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Fig. 7.

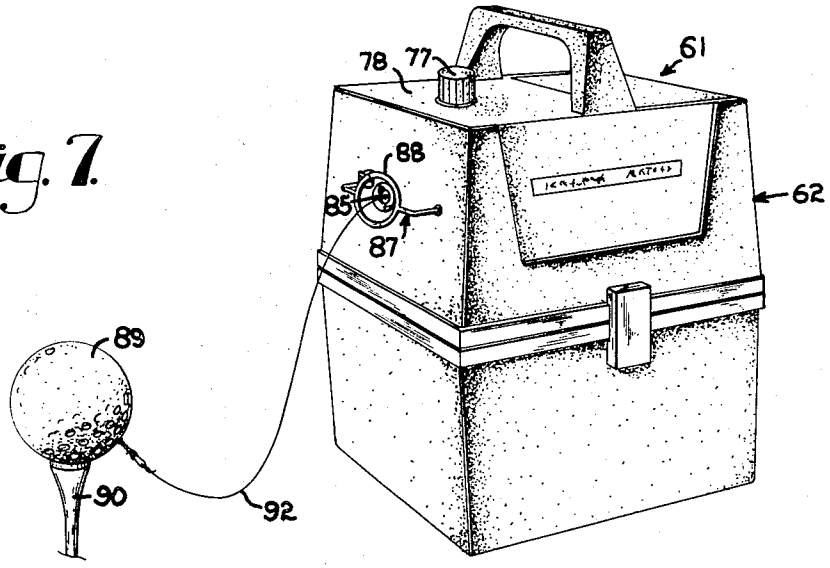
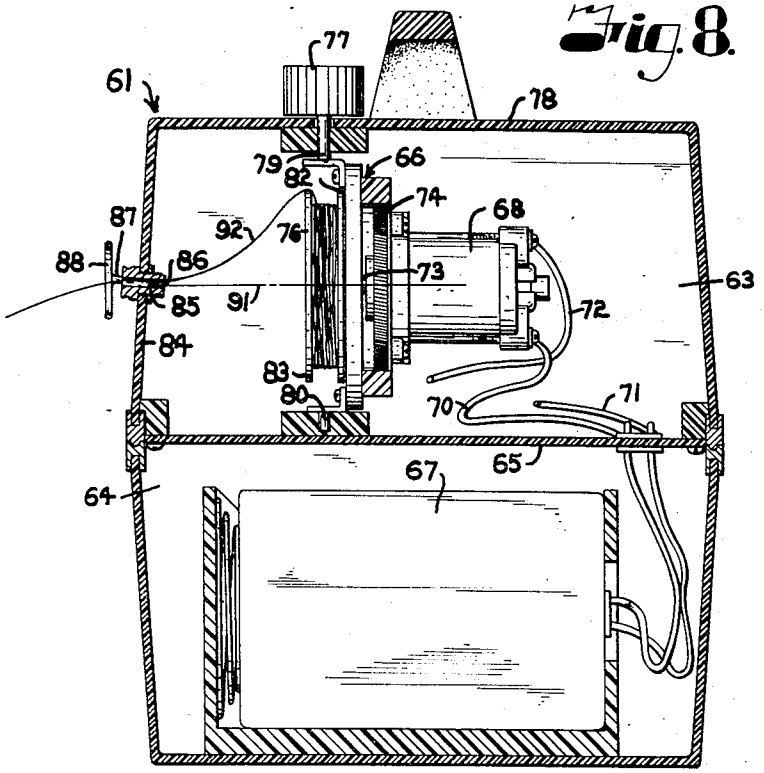


Fig. 8.



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Fig. 9.

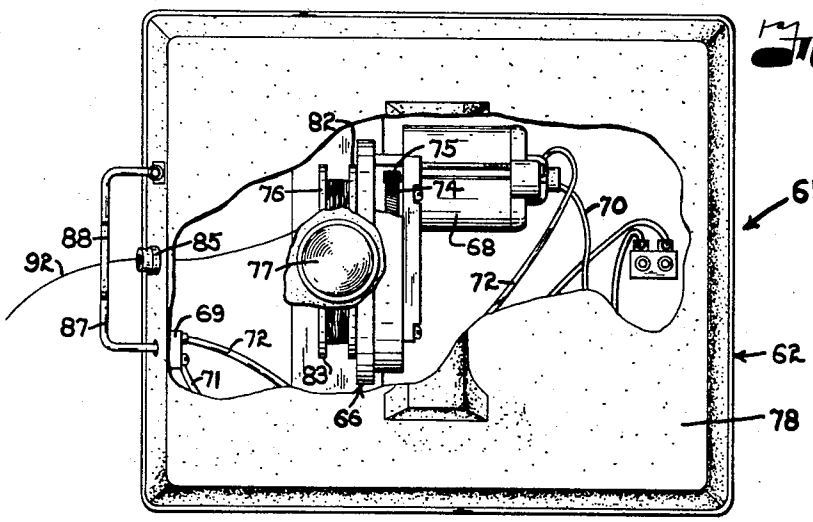


Fig. 10.

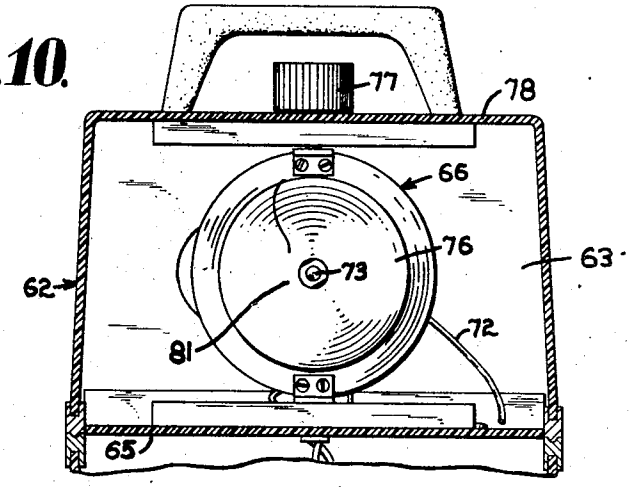
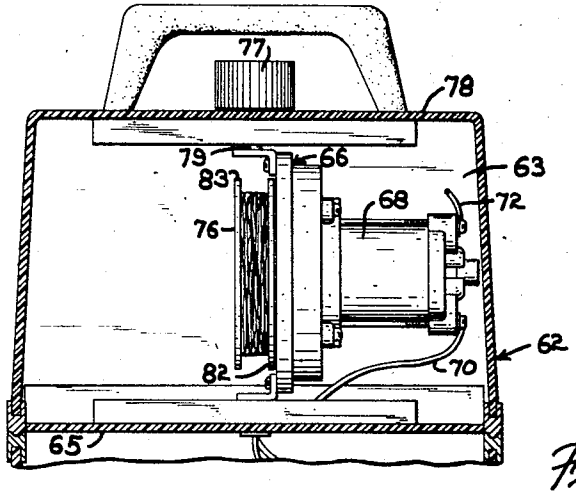


Fig. 11.



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ARTICLE RETRIEVING APPARATUS

The present invention relates to an article retrieving apparatus and more particularly to a golf ball retriever which is highly compact, lightweight, and extremely efficient in operation.

The principal objects of the present invention are: to provide an article retrieving apparatus for retrieving articles, such as golf balls, projectiles fired at targets, plumb weights and the like; to provide such an article retrieving apparatus which is portable, lightweight, and which minimizes drag on a line having the article affixed thereto to simulate ordinary free flight of the article when same is propelled or cast from the article retrieving apparatus; to provide such an article retrieving apparatus having a non-rotating bobbin which is reciprocated to effect even winding of a line therearound, whereby the line is wound in a diagonal pattern thereby substantially preventing one layer of the line from binding between portions of a previously wound layer of line; to provide such an article retrieving apparatus wherein the travel of the bobbin is coordinated with the dimensions of the line receiving space within the bobbin to effect substantially uniform winding of the line around the bobbin and substantially drag-free unwinding of the line from the bobbin; and to provide such an article retrieving apparatus which is economical to manufacture, durable in construction, efficient in operation, and particularly well adapted to the proposed use.

Other objects and advantages of this invention will become apparent from the following description taken in connection with accompanying drawings wherein are set forth by way of illustration and example certain embodiments of this invention.

FIG. 1 is a side elevational view of an article retrieving apparatus embodying features of the present invention with portions broken away to better illustrate the component parts.

FIG. 2 is a plan view of the article retrieving apparatus with a portion of a housing broken away.

FIG. 3 is a fragmentary elevational view of a spinner cap with portions broken away to show cam surfaces on a bobbin.

FIG. 4 is a longitudinal sectional view showing the spinner cap in position to permit unwinding of the line from the bobbin.

FIG. 5 is a longitudinal sectional view showing the spinner cap in position for effecting winding of the line around the bobbin.

FIG. 6 is an exploded perspective view of the operative parts for effecting rotation of a spinner cap and reciprocation of the bobbin.

FIG. 7 is a perspective view of a modified article retrieving apparatus.

FIG. 8 is a longitudinal sectional view through the modified retrieving apparatus.

FIG. 9 is a plan view of the modified article retrieving apparatus with portions broken away to show a bobbin in an unwinding position.

FIG. 10 is a transverse sectional view showing the bobbin in the unwinding position.

FIG. 11 is transverse sectional view showing the bobbin in a winding position.

Referring more in detail to the drawings:

The reference numeral 1 generally designates an article retrieving apparatus enclosed within a housing 2 having upper and lower compartments 3 and 4 respectively, with a suitable power source, such as a storage battery 5, mounted in the lower compartment 4 and the operative elements of the article retrieving apparatus 1 mounted in the upper compartment 3.

In the illustrated structure, an article 6 to be retrieved, such as a golf ball, projectile, plumb weight or the like, which is to be cast, propelled, or driven away from the article retrieving apparatus 1 and to be returned thereto, is affixed to one end of a suitable flexible member, such as a line or cord 7 having the other end thereof secured to a storage bobbin 8. The storage bobbin 8 is movably supported on a frame 9, upstanding from a base member 10 which is in the form of a generally horizontal partition or wall separating the upper and lower compartments 3 and 4.

A motor 11 is suitably supported within the upper compartment 3, as by being mounted on the base member 10 or the frame 9. A switch 12 is mounted on a top wall 13 of the housing 2 and is operatively connected to the power source 5 and the motor 11 by conductors 14 and 15 respectively and a conductor 16 extends between and is connected to the battery 5 and the motor 11 to complete a circuit for activating the motor 11 when the switch 12 is moved to an "on" position, as by being depressed.

A pinion gear 17 is rotated by the motor 11 and interengages with a gear 18 mounted on a rotatable shaft 19, spaced above the base member 10 and rotatably supported on the standard 9, as by a suitable bearing or bushing mounted in arms 20 extending from the standard 9 for supporting the rotatable shaft 19 intermediate its ends.

The gear 18 is positioned on one side of arms 20 extending from the standard 9 to balance that portion of the shaft 19 positioned on the opposite side of the arms 20. The rotatable shaft 19 has a bore 22 extending longitudinally therethrough and coaxially therewith and a portion of the bore 22 has a flat surface 23 for engagement with a flat surface 24 of a spinner support shaft 25 which is received within the rotatable shaft 19, as later described.

An exterior surface of the rotatable shaft 19 has a guide groove 26 therein arranged in a pattern to effect reciprocation of the storage bobbin 8 within a cap 27 mounted on the spinner support shaft 25 adjacent one end thereof for rotation with the spinner support shaft 25. The cap 27 has an annular flange 28 enclosing a portion of the storage bobbin 8 during reciprocation thereof. A free edge of the flange 28 guides the line or cord 7 onto the bobbin 8, as later described.

A spool bushing 29 is sleeved on the rotatable shaft 19 and has an aperture 30 therein for receiving a pawl 31 which is engageable within the guide groove 26 for travel therein to effect reciprocation of the spool bushing 29 when there is relative rotation between the bushing 29 and the rotatable shaft 19. The storage bobbin 8 has a keyway 32 to receive a key such as an enlarged portion of the pawl 31 for securing the storage bobbin 8 on the spool bushing 29.

The spool bushing 29 has a groove 34 in an exterior surface thereof and adjacent one end to receive a retainer ring 35 for engaging one end of the storage bobbin 8. The spool bushing 29 has an enlarged portion 36 at the other end thereof, forming a shoulder 37, to

be engaged by the other end of the storage bobbin 8 whereby the bobbin 8 is positioned between the shoulder 37 and the retainer ring 35.

In the illustrated structure, the storage bobbin 8 has a body portion 38 with a pair of spaced substantially parallel annular flanges 39 and 40 extending therefrom. It is desirable to hold the bobbin 8 against rotation during the reciprocation thereof; therefore, a guide arm 41 is mounted on and extends outwardly from one of the annular flanges, for example flange 40, and the arm 41 is received in an aperture 43 in a housing 44 supported on the arms 20 of the standard 9. The guide arm 41 has a length sufficient to maintain a portion thereof within the aperture 43 during the reciprocation of the bobbin 8 whereby the bobbin 8 is held against rotation during reciprocation.

The cap 27 has a pin 45 resiliently mounted thereon and movable between an extended position 46 and a retracted position 47. A free end of the pin 45 is positioned exteriorly of the cap 27 when the pin 45 is in the extended position 46 whereby the flexible member 7 is engaged by the pin 45 and wound around the bobbin 8 in response to rotation of the cap 27.

A suitable resilient member, such as a leaf spring 48 is mounted on an interior surface of the cap 27 and is adapted to urge the pin 45 toward the retracted position 47. The pin 45 is mounted on one end of a bar 49, having the other end thereof shaped to ride on the exterior surface of the rotatable shaft 19.

The spinner support shaft 25 is resiliently mounted in the bore 22 of the rotatable shaft 19 by a suitable resilient member, such as an elongate helical spring 50 sleeved on the spinner support shaft 25 at one end thereof, and the spring 50 has opposite ends in engagement with one end of the rotatable shaft 19 and one end of the spinner support shaft 25 respectively, for urging an enlarged portion 51 at the other end of the spinner support shaft 25, into seating engagement within a recess 52 in the other end of the rotatable shaft 19.

A push rod 53 has one end positioned within the housing 2 and aligned with the spinner support shaft 25 to engage the resiliently mounted end of the spinner support shaft 25. The push rod 53 has the other end thereof extending exteriorly of the housing 2 with an enlarged portion 54 thereon. When the enlarged end 54 and the push rod 53 are moved toward the spinner support shaft 25, the spring 50 will be compressed permitting the cap 27 to be moved to a position spaced from the adjacent end of the rotatable shaft 19. The leaf spring 48 then urges the bar 49 between the cap 27 and the adjacent end of the rotatable shaft to maintain the spacing therebetween and to maintain the pin 45 in the retracted position 47.

The bar 49 has an enlarged portion 55, having, at one end thereof, a lower surface 56 shaped and positioned to be engaged by one of a plurality of cam surfaces 57 mounted on an exterior surface of the annular flange 39 of the bobbin 8 to move the free end of the pin 45 to the extended position 46 in response to rotation of the rotatable shaft 19 and reciprocation of the bobbin 8.

The cap 27 is spaced inwardly from a side wall 58 of the upper compartment 3 of the housing 2. A sleeve 59 is mounted in the side wall 58 and has a bore therethrough for guiding the flexible member 7 into engagement with the pin 45, when same is in the extended position 46.

In use the housing 2 having the article retrieving apparatus 1 therein is carried to a desired location by a suitable handle 60 mounted on the top wall 13 of the housing 2. The enlarged end 54 of the push rod 53 is moved toward the housing 2, thereby moving one end of the push rod 53 into engagement with the end of the spinner support shaft 25 to position the cap 27 in spaced apart relation with the adjacent end of the rotatable shaft 19. The leaf spring 48 then urges the bar 49 between the cap 27 and the rotatable shaft 19 to move the pin 45 to the retracted position 47 within the cap 27. The article 6 is then free to be cast, driven, or projected from the article receiving apparatus 1, and the line or flexible member 7 is free to unwind from the bobbin 8 in a substantially drag-free manner when the article, such as the golf ball 6, is driven from the article retrieving apparatus 1. When it is desired to retrieve the golf ball 6, or similar article, the switch 12 is depressed as by pressing thereon with the foot or golf club of an operator (not shown) thereby completing a circuit between the power source or battery 5 and the motor 11 to effect rotation of the shaft 19 which rotates the shaft 25 and the cap 27 mounted thereon. Rotation of the shaft 19 effects reciprocation of the bobbin 8 which moves one of the cam surfaces 57 thereon into engagement with the lower surface 56 of the enlarged portion 55 of the bar 49 to overcome the resistance of the leaf spring 48 and move the bar 49 out of the position between the cap 27 and the end of the shaft 19 and move the pin 45 to the extended position 46. The spring 50 moves the enlarged portion 51 into seating engagement within the recess 52 in the shaft 19, whereby the bar 49 is supported on the exterior surface of the shaft 19 and the pin 45 is maintained in the extended position 46. Continued rotation of the cap 27 winds an intermediate portion of the flexible member 7 around the body portion 38 of the bobbin 8 during reciprocation thereof. The distance between facing surfaces of the flanges 39 and 40 of the bobbin 8 is substantially equal to the length of the travel of the bobbin 8 during reciprocation and the free edge of flange 28 of the cap 27 is positioned to align with one of the facing surfaces of the flanges 39 and 40 at one end of the reciprocation and to align with the other of the facing surfaces at the other end of the reciprocation. The speed of rotation of the cap 27 is coordinated with the speed of the reciprocation of the bobbin 8 to effect smooth winding of the line 7 in diagonal layers on the body member 38. When the article 6 has been moved into engagement with an exterior surface of the side wall 58, the switch 12 may be released to break the circuit between the battery 5 and the motor 11.

FIGS. 7 to 11 inclusive, illustrate a modified article retrieving apparatus 61 mounted within a housing 62 having upper and lower compartments 63 and 64 respectively, separated by a partition or base support 65 having a frame 66 pivotally mounted within the upper compartment 63.

A suitable power source 67, such as a battery, is mounted in the lower compartment 64 and electrically connected to a motor 68 and a switch 69 by conductors 70 and 71 respectively. A conductor 72 extends between the switch 69 and the motor 68 to energize or

activate the motor **68** when the switch **69** is moved on an "on" position.

In the illustrated structure, the motor **68** is mounted on the frame **66** and is movable therewith. A shaft **73** is rotated by the motor **68** through interengagement between gears **74** and **75** mounted on the shaft **73** and driven by the motor **68** respectively. A bobbin **76** is sleeved on the shaft **73** and rotatable therewith.

In the illustrated structure, a knob or handle **77** is positioned outside the housing **62** and above the top wall **78** of the housing **62** and a rod **79** extends downwardly therefrom and is fixedly connected to the frame **66** adjacent an upper end thereof. A lower end of the standard or frame **66** has a rod **80** pivotally mounted on the partition **65** whereby turning the handle or knob **77** pivots the standard or frame **66** and the bobbin **76** mounted thereon.

In the illustrated structure, the bobbin **76** has a body portion **81** and a pair of spaced substantially parallel annular flanges **82** and **83** extending therefrom. The bobbin **76** is positioned adjacent a side or end wall **84** of the housing **62** and a sleeve member **85** is mounted in the side or end wall **84** and has a bore **86** therethrough.

The switch **69** is preferably of the push-pull type and has a push-pull bar **87** connected thereto. The push-pull bar **87** is positioned outside the side or end wall **84** and has a center portion **88** parallel with the wall **84** and aligned with the bore **86** through the sleeve member **85**. The push-pull bar **87** is movable between an extended or "on" position and a retracted or "off" position.

In using the modified article retrieving apparatus **61**, the housing **62** is placed on a suitable support surface and an article **89** to be retrieved, such as golf ball, is moved outwardly from the housing **62** and placed on a suitable support, such as golf tee **90**. The knob or handle **77** is turned to position a central axis **91** of the shaft **73** and bobbin **76** in alignment with the bore **86** through the sleeve member **85**. The golf ball **89** is then driven by a suitable club (not shown) and a flexible line **92** having one end affixed to the golf ball **89** is unwound from the bobbin **76** in a substantially drag-free manner. When it is desired to retrieve the article or golf ball **89**, the knob or handle **77** is turned to align the space between the flanges **82** and **83** of the bobbin **76** with the bore **86** of the sleeve member **85** to thereby position the central axis **91** of the shaft and bobbin **76** normal or perpendicular to the axis of the bore **86**. The switch **69** is then moved to the "on" position to complete a circuit to the motor **68** which effects rotation of the shaft **73** and the bobbin **76** to wind the flexible line **92** around the body portion **81** of the bobbin **76**. When the article **89** engages the center portion **88** of the push-pull bar **87**, the bar **87** is moved to the "off" or retracted position to break the circuit to the motor **68**.

It is to be understood that while I have illustrated and described certain forms of my invention, it is not to be limited to these specific forms or arrangement of parts herein described and shown.

I claim:

1. An article retrieving apparatus comprising:

a. a base member having a frame upstanding therefrom;

b. an elongated rotatable shaft spaced from said base member and supported on said frame, said shaft having spaced opposite ends;

c. a storage bobbin sleeved on said rotatable shaft and movable longitudinally therealong, said storage bobbin having a pair of spaced substantially parallel flanges and a plurality of cam surfaces on an exterior surface of one of said flanges;

d. means operatively engaging said shaft for effecting rotation of said shaft;

e. an elongate flexible member having an article to be retrieved affixed to one end thereof;

f. means operatively engaging said bobbin and said shaft for reciprocating said bobbin to thereby receive an intermediate portion of said flexible member in response to rotation of said shaft;

g. means mounted on said shaft for longitudinal movement relative to said shaft and rotatable with said shaft and for guiding the intermediate portion of said flexible member into engagement with said bobbin for winding said intermediate portion of said flexible member around said bobbin in response to rotation of said shaft, said means for guiding the intermediate portion of said flexible member into engagement with said bobbin includes a cap having a flange enclosing a portion of said bobbin during reciprocation thereof and movable between a position engaging one end of said shaft and a position spaced from the one end of said shaft and a pin resiliently mounted on said cap and movable between an extended position having a free end of said pin extending exteriorly of said shaft and a retracted position having the free end of said pin within said cap and the other end between said cap and said shaft; and

h. a portion of said pin engageable by one of said cam surfaces on said bobbin when said pin is in said retracted position whereby rotation of said shaft effects movement of said pin to said extended position to guide the intermediate portion of said flexible member into said bobbin.

2. An article retrieving apparatus as set forth in claim **1** wherein said means for guiding the intermediate portion of said flexible member into engagement with said bobbin includes:

a. a bore extending longitudinally through said shaft and coaxial with said shaft;

b. a second shaft movably received within said bore through said first named shaft, said cap being mounted on said second shaft and movable therewith, said other end of said pin being in engagement with said second shaft when said pin is in the retracted position;

c. resilient means engaging said first named shaft and said second shaft for urging said cap into engagement with the one end of said first named shaft; and

d. a flat surface on said first named shaft and on said second shaft, said flat surfaces being in engagement whereby said second shaft and said cap and pin on said cap are rotated with said first named shaft.

3. An article retrieving apparatus as set forth in claim **2** including:

a. a housing supported on said frame and having a portion surrounding said first named shaft, said portion of said housing being spaced from said cap to permit the intermediate portion of said flexible member to move therebetween;

b. a guide aperture in said housing and spaced from said bobbin; and

c. a guide arm mounted on said bobbin and extending outwardly therefrom and received in said guide aperture in said housing thereby holding said bobbin against rotation with said first named shaft.

* * * * *