United States Patent

[11] 3,601,113

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[45] Patented **Aug. 24, 1971**

[54] **ROTARY BOW QUIVER**
15 Claims, 18 Drawing Figs.

[52] **U.S. Cl.** **124/48,** 124/24, 224/1
[51] **Int. Cl.** **F41c 25/00**
[50] **Field of Search** ..... 124/22, 23, 24, 41, 45, 48; 224/1.5; 150/1.5 A

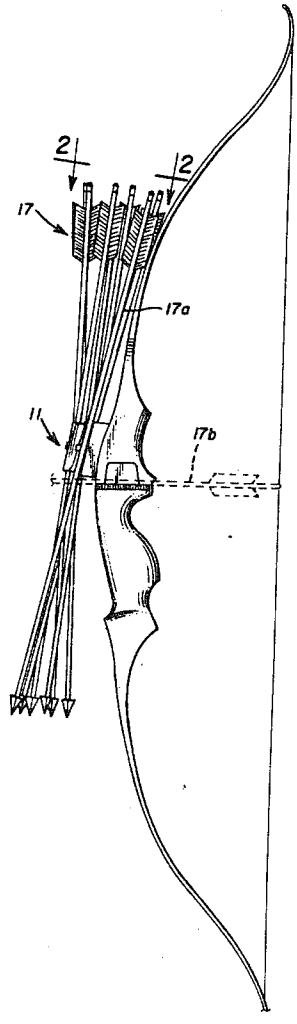
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ABSTRACT: Bow quiver supports a plurality of arrows on a bow with the arrows being obliquely inclined to one another and to the longitudinal axis of the support body and disposed in a balanced generally circular array. The quiver has a support body with a plurality of circumferentially spaced individual arrow support stations. A leading arrow in the discharge position preferably extends diagonally across the back of the bow and falls directly into the shooting position when released from its support station. The arrows are successively advanced to a discharge position by the rotation of the support body. One form of support body is essentially cylindrical and has a plurality of slots extending along and through the outer periphery of the body in which the arrows are releasably supported. Another form has upstanding end walls with cooperative offset slots therein together with a central stop member against which the arrow pivots to release the arrow through the slot openings in a pivotal action.



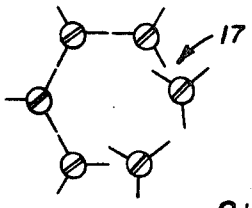


FIG. 2

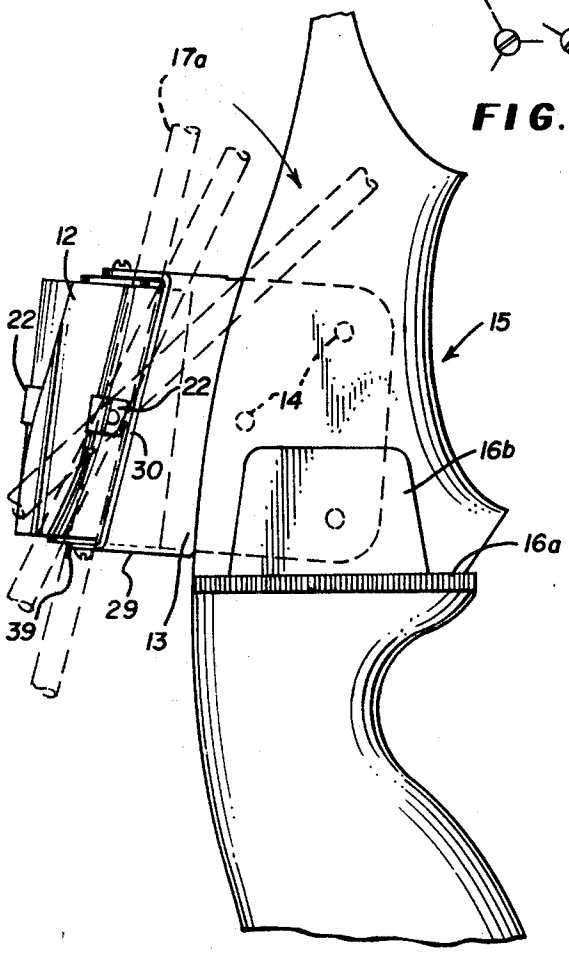


FIG. 4

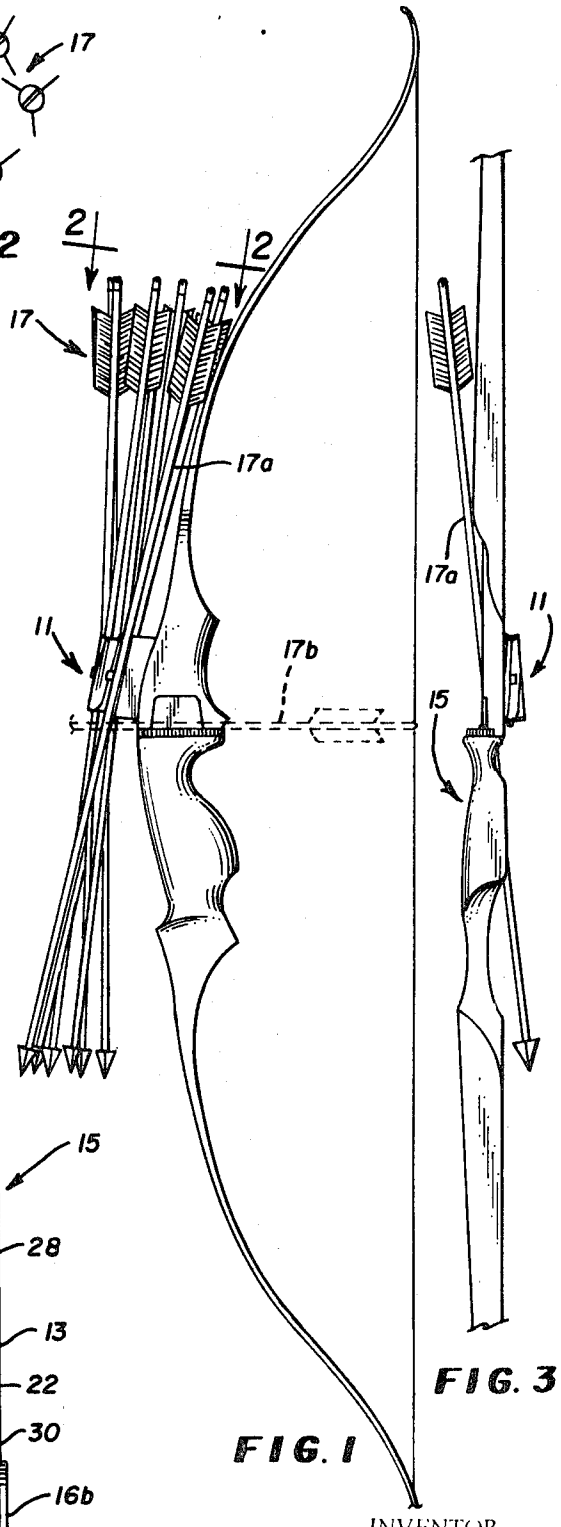


FIG. 3

FIG. 1

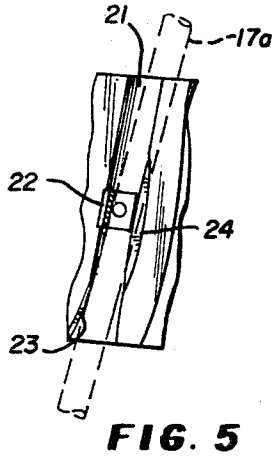


FIG. 5

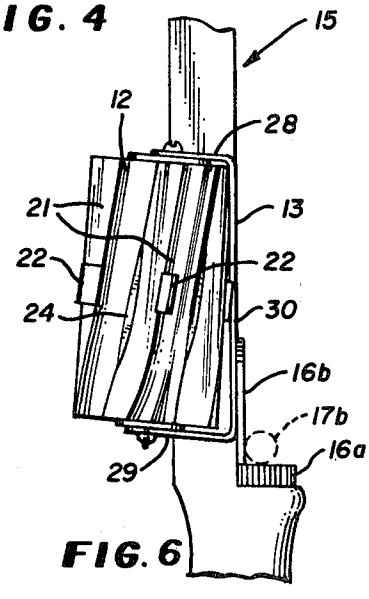


FIG. 6

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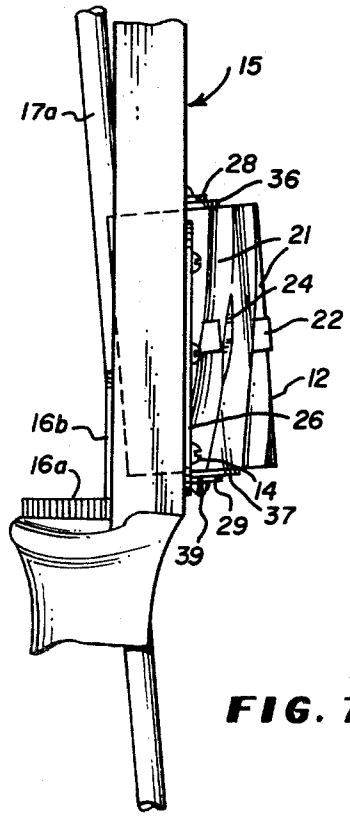


FIG. 7

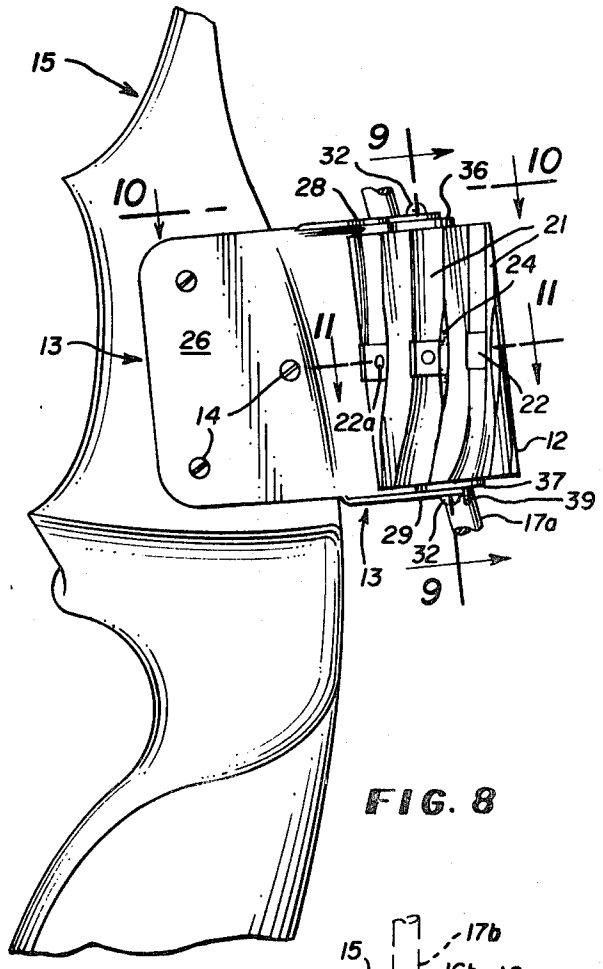


FIG. 8

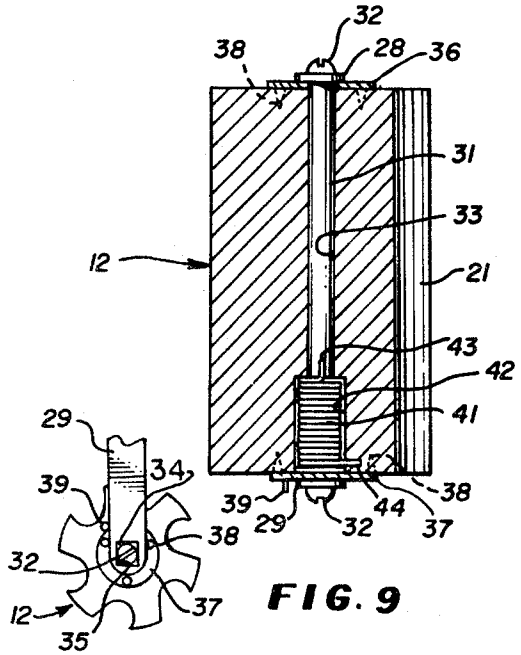


FIG. 9

FIG. 12

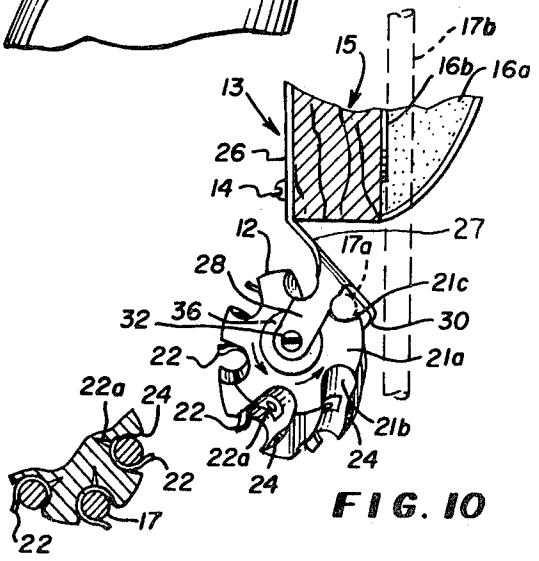


FIG. 10

FIG. 11

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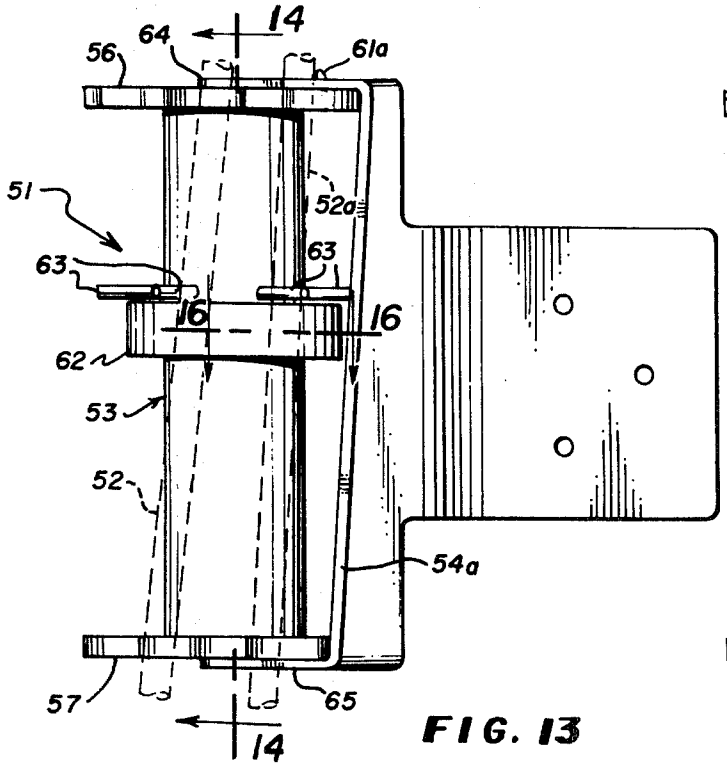


FIG. 13

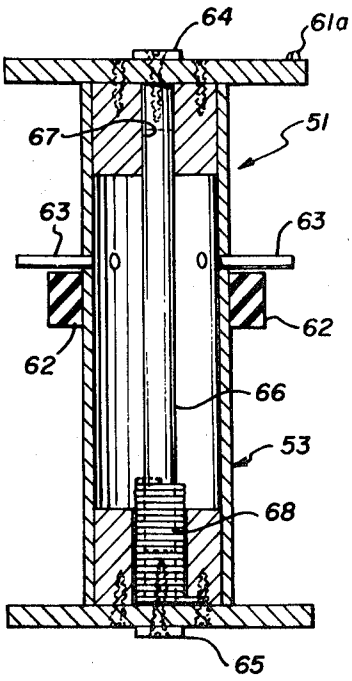


FIG. 14

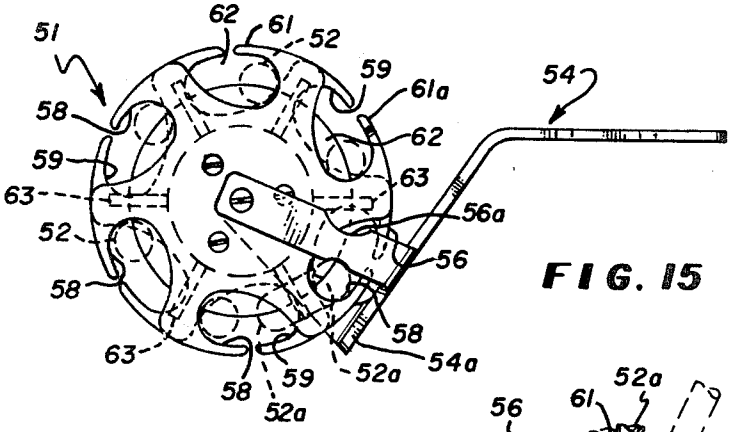


FIG. 15

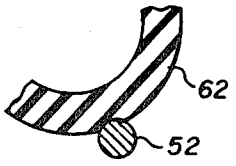


FIG. 16

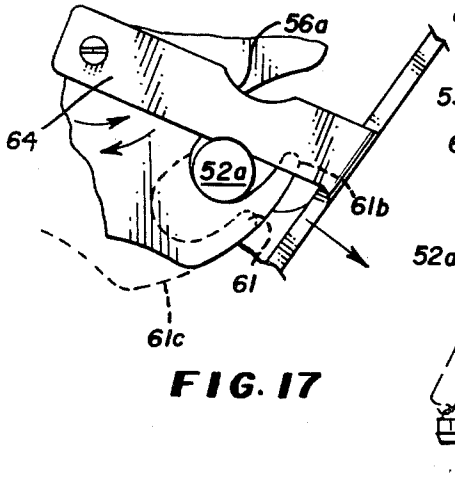


FIG. 17

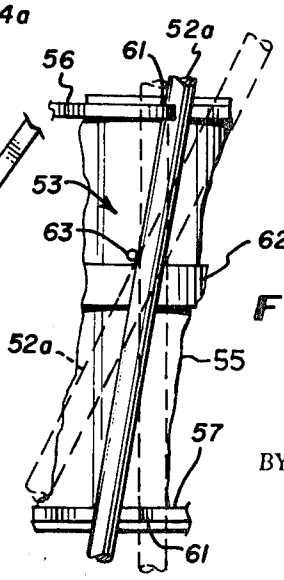


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ROTARY BOW QUIVER

This invention relates to a rotary bow quiver for releasably supporting a plurality of arrows on a bow for rapid successive movement into the shooting position and is related to a copending application entitled MAGAZINE-TYPE BOW QUIVER, Ser. No. 839,311, filed July 7, 1969.

As noted in the above-referred to copending application, quivers for arrows mounted on a bow offer several advantages over those which are mounted on a person. Further the previously known bow-mounted quivers have not heretofore provided the greatest degree of balance on the bow, quickness of releasing movement, and reliability of support for shooting which is particularly important for game hunters.

In the above-referred to copending application there is shown and described a bow quiver in which a plurality of arrows are disposed in support stations in a stack arranged with each arrow being twisted obliquely to one another through a small angle about a fixed reference line. The support for the arrow is provided by a support body having slotted portions in the form of elongated, reversely inclined, U-shaped slots in opposed walls with a leading of the arrows being passed through openings at one end of the slots upon the pivoting of the leading arrow about a central stop. A spring and plunger assembly applies the force to advance the arrows each time one is removed. The quiver therein described disposes the arrows on the bow so as to position the leading arrow diagonally across the back of the bow with the point down and the fletched end to one side so that the arrow will pivot directly out and down onto the arrow rest.

In accordance with the present invention there is provided a bow quiver which also has support stations arranged to dispose the arrows with each obliquely inclined with respect to the longitudinal axis of the support body and to one another through a small angle but in the embodiment of this application the arrows are arranged about a fixed circle or in a circular array rather than along a straight line. The arrow support body defining the support stations is rotated about the axis of this fixed circle to successively advance the leading arrow to a discharge position. This rotary form of bow quiver preferably disposes the leading arrow in the same discharge position relative to the bow as in the above-referred to copending application so that the leading arrow is to be grasped and pulled directly onto the arrow rest in a relatively short stroke. One form of rotary quiver body shown has a plurality of circumferentially spaced and obliquely inclined slots extending along and recessed in the periphery of the support body which open through the end walls and another form has upstanding end wall portions with offset slots for each arrow together with a central stop member against which the arrow is pivoted to release it through the slot openings.

Accordingly, it is an object of this invention to provide a simple, durable, lightweight rotary bow quiver.

Another object of this invention is to provide a bow quiver which will dispose the leading arrow for grasping on either side of the bow in a convenient position for rapid launching of several arrows in succession.

It is yet a further object of this invention to provide a bow quiver which will support a relatively large number of arrows in individual support stations in a balanced circular array with the adjacent heads and fletched ends spaced apart which will automatically advance another arrow to a discharge position on the bow after one has been removed.

The above objects, advantages and capabilities of the present invention will become more apparent as the description proceeds taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a side elevational view showing the loaded rotary bow quiver and bow assembly embodying features of the present invention.

FIG. 2 is an enlarged top plan view taken along lines 2—2 of FIG. 1 showing the generally circular arrangement of the spaced fletched ends of the supported arrows.

FIG. 3 is a fragmentary rear elevational view showing particularly the position of the leading arrow relative to the bow with the other arrows removed for clarity.

FIG. 4 is an enlarged fragmentary side elevational view of the assembly shown in FIG. 1.

FIG. 5 is a fragmentary side elevational view of the assembly shown in FIG. 1 with the arrow in a position where it has just been released.

FIG. 6 is a fragmentary front elevational view of the assembly with the arrows removed from the support body.

FIG. 7 is an enlarged fragmentary rear elevational view of the assembly shown in FIG. 3.

FIG. 8 is an enlarged side elevational view of the assembly and viewing it from the opposite side of that of FIGS. 1 and 4.

FIG. 9 is a sectional view taken along lines 9—9 of FIG. 8.

FIG. 10 is a top plan view partially in section along lines 10—10 of FIG. 8 through the bow with only the leading arrow shown.

FIG. 11 is a fragmentary sectional view through the support body taken along lines 11—11 of FIG. 8.

FIG. 12 is a fragmentary bottom view of the support body.

FIG. 13 is a side elevational view of another form of rotary bow quiver embodying features of the present invention.

FIG. 14 is a sectional view taken along lines 14—14 of FIG. 13; and

FIG. 15 is a top plan view of the quiver shown in FIGS. 13 and 14.

FIG. 16 is a fragmentary sectional view taken along lines 15—15 of FIG. 13.

FIG. 17 is a fragmentary top plan view of the quiver showing a reverse rotation support body upon removal of the leading arrow; and

FIG. 18 is a fragmentary elevational view drawn to a smaller scale than FIG. 13 illustrating the removal of the leading arrow as shown also in FIG. 17.

Referring now to the drawings the rotary bow quiver shown which is generally designated by numeral 11 broadly comprises an assembly of an arrow support member or body 12 which is rotatably secured on a mount 13. Screws 14 are shown threaded through apertures in the mount to illustrate one means to fasten the mount to a central portion of a bow 15. As is also shown and described in the above-referred to application, the arrow support body is preferably disposed backwardly of the bow and above the shooting position which is defined by the arrow rest 16*a* and an upright pressure plate 16*b*. In a similar manner the arrows 17 are disposed with their points down with a leading arrow 17*a* in a discharge position in which it is shown as extending diagonally across the back of the bow with its midpoint preferably being above the arrow rest 16*a* and with its fletched end forwardly of the bow and to one side or the other depending on whether or not the bowman is right or left handed, as best shown in FIG. 3. In general, then a downward and rearward pulling force applied to the fletched end releases the leading arrow from the quiver and it falls directly onto the arrow rest as represented in dashed lines at 17*b*. As best shown in FIG. 6, the rotary support body 12 is shown disposed just to the inside of the pressure plate 16*b* and just clears the pressure plate so as to not interfere with the launching of the arrow. In this form of quiver another arrow is advanced to the discharge position each time one is removed upon the rotation of the support body so that the arrows can be fixed in a rapid succession without the bowman having to remove his eyes from the target.

Broadly stated, the rotary support body 12 provides a series of circumferentially arranged arrow support stations each identified on the drawings by numeral 21 which are in the form of U-shaped slots 21 disposed along and through the peripheral surface of the body and they are sized to slidably receive and releasably support each arrow individually. These slots 21 are obliquely arranged on the cylindrically shaped support body shown or in a skewed relation thereto so that the ends of the slot are in offset position with respect to each other. Each slot 21 is preferably sized so that the supported

arrow is recessed to a flush position or inset relative to the peripheral surface of the body.

The oblique or skewed relation of the support stations on the circumference of the support body is established by the twisting of true longitudinally extending peripheral slots at the ends in opposite directions through a slight angle, the angle or degree of twist being a sufficient degree to separate the heads and fletched ends of the adjacent arrows supported thereon. As best shown in FIG. **9** the slots **21** are separated at approximately equally spaced intervals with the exception of a wider section **21***a* between the first (referring to the first slot unloaded with the quiver is full) and last slots designated **21***b* and **21***c* respectively, which compensates for the width of the support arms of the mount hereafter described when the support body is fully loaded. This is noted in FIG. **2** as providing a slightly greater gap between two of the arrows **17**.

A resilient cliplike section **22** is provided centrally of each of the slots which with the opposed slot wall firmly but releasably grips the central part of the arrow. This clip section **22** is essentially C-shaped, as best shown in FIG. **11**, and is formed of a resilient material such as spring steel to firmly hold the arrow in the slot and spread or yield away from the slot opening when the fletched end of the arrow is pulled down to release the arrow from the slot as hereafter described. A fastener **22***a* in the form of a tack is shown securing the clip to the body. Although one form of releasable grip construction has been shown in the slot to hold the arrow at its support station, it is understood that other forms of gripping structure may also be used to provide this function.

Each of the support slots is provided with an outwardly inclined edge **23** along a lower sidewall and a rounded or beveled edge **24** in the opposite sidewall which facilitates removal and prevents binding in the pivotal action of the arrow during its removal from the slot as best shown in FIG. **5**.

The mount **13** for the support body is comprised of an essentially flat plate member having a straight base portion **26** which engages a side of the bow and a forward portion **27** bent laterally of its length at an angle so as to extend and incline diagonally across the back of the bow and has upper and lower support arms **28** and **29** disposed at the front end of the base portion **26** projecting outwardly and at an angle to the flat surfaces thereof with the support arms extending generally parallel to the arrow rest **16***a*. As best shown in FIG. **4**, the rearward edge **30** of the mount is inclined rearwardly and outwardly from top to bottom along the same angle as the leading of the slots **21**.

For rotatably supporting the body **12** the mount **13** has a shaft **31** secured between the ends of the support arms and shown detachably secured thereto by screws **32** which extend through the arms into the ends of the shaft. The support body **12** has a central bore **33** which slides over the shaft **31** so that the body is freely rotatable thereon about its longitudinal axis. The lower end of the shaft has a square configured portion **34** and the lower support arm **29** has a corresponding square aperture **35** to slidably receive the shaft and thereby prevent rotation of the shaft relative to the mount. Upper and lower bearing plates **36** and **37** are shown secured to the upper and lower ends of the support body by screws **38** to serve as spacers and bearings between the support arms and the support body. A stop member **39** projects from the bottom of the body **12** and engages the lower arm after the last arrow has been removed to prevent further rotation thereof.

For the rotary movement of the support body about the shaft there is provided a coil-type compression spring **41** which fits over the shaft **31** and is disposed in an enlarged bore section **42** of the support body, the spring having its upper end **43** extending into and secured in an aperture in the shaft and its lower end **44** secured to the support body as by extending into an aperture in the body or being held between the bearing plate **37** and the end of the support body. With the ends of the spring so secured the support body will be rotated in one direction prior to loading the arrows into the slots **21** whereby the spring will be placed under compression or wound and it will then rotate the body in the opposite direction to advance the arrows to the discharge position each time one is removed. As best shown in FIG. **10** the leading arrow **17***a* bears against the side edges of the support arms **28** and **29** to stop the body **12** from rotation, and once the leading arrow is removed the support body will rotate in the counterclockwise direction as viewed in FIG. **10** until the next arrow bears against the support arms. The upper support arm **28** is shown to have narrowed portions to receive a portion of the arrow to permit the full loading of the support body. Although an internally mounted coil spring assembly has been shown and described as the force-applying mechanism for the rotary body, it is understood that other self contained force-applying mechanisms could be employed to produce the same results.

In the general operation the removal of the leading arrow **17***a* is best shown in FIG. **5** wherein as the fletched end of the leading arrow is drawn downwardly and toward the string the arrow snaps out of the clip section **22** and a forward surface of the arrow slides along inclined edge **23** and a rear surface of the arrow slides over beveled edge **24**. In a continual downward movement the arrow passes across the inclined edge **30** and will fall directly onto the arrow rest **16***a*. Once the arrow is released from the support body, the support body is rotated by the spring **41** until the next arrow engages the upper and lower support arms, and this procedure repeats until the last arrow has been removed whereupon the stop member **39** will engage the lower support arm.

The other form of rotary bow quiver **51** shown in FIGS. **13–18** supports the arrows **52** at a circumferentially spaced individual stations in generally the same balanced circular array obliquely to one another with each arrow being twisted about its ends about a fixed circle and in the same manner relative to each other as above described. This bow quiver **51** comprises an arrow support member or body **53** which is rotatably mounted on a mount **54**, with mount **54** being of the same general configuration as mount **13** above described which may fasten to the bow as by screws so that the same above description applies thereto and the leading arrow **52***a* is disposed in the same general location relative to the bow.

The rotary support body **53** is also essentially cylindrical in shape and comprises a generally cylindrical intermediate base portion **55** having spaced upstanding end walls **56** and **57**. To receive the arrows these end walls are provided with a series of circumferentially arranged slots with a cooperative set of slots for supporting an arrow individually being designated **58** and **59**. Each end wall has a series of essentially arcuate projections or fingers **61** emanating therefrom which define the upper portions of the slots and terminate in spaced proximity to the rounded back of an adjacent projection to form a radially extending slot opening **62**. Each cooperative set of arrow-receiving slots for receiving one arrow is offset or twisted about a fixed circle midway between the end walls so as to dispose the arrows in the oblique or skewed manner relative to one another on the support body. The oppositely disposed cooperative set of projections for each arrow extend in opposite directions and the cooperative slot openings are offset one from another and open radially though the periphery of the support body so that the arrow will slide therethrough when the arrow is pivoted by applying a force to the fletched end. On the base portion **55** there is provided a resilient ring-shaped member **62** which engages the central portion of the arrow and presses it against the projections or fingers **61** to hold the arrow in place together with a stop member **63** disposed to one side of the arrow which acts as a pivot against which the arrow is pivoted to move it out of the opposed slots.

For the rotary support of the body **53** there is provided on mount **54**, spaced upper and lower support arms **64** and **65** having a central shaft **66** secured therebetween on which the body with a central bore **67** provided in end head section is rotatably mounted. A forward inclined edge **54***a* extends from the top support arm to the bottom support arm. The force applying member is again shown as an internal coil-type spring **68** secured at its ends in an aperture in the shaft and between

the lower end wall and end of the base portion to rotate the body as each arrow is removed in a manner similar to the other form above-described. The last or trailing upper projection **61***a* is turned upward and will engage the upper support arm after all of the arrows have been removed and thereby functions as a stop member.

In the loading of the rotary support body **53**, it is first rotated against the action of the spring **68** or clockwise as viewed in FIG. **15**. The leading arrow bears against the upper and lower support arms to in effect form a stop for the rotary body **53** when arrows are loaded therein.

The leading arrow **52***a* is held firmly against the upper and lower support arms and they are preferably slightly recessed to the contour of the arrow. In this position the forward end portion **61***b* of the top projection as best shown in FIG. **17** extends under the upper arm **64**. In the removal of the leading arrow, a force is again applied rearwardly and downwardly and toward the string against the fletched end of the arrow. This tends to rotate the support body in a reverse direction against the action of the spring and moves the upper projection away from the upper support arm to a position **61***c* as shown in dashed lines in FIG. **17** wherein the arrow will clear the support arm and pivot out of the slot opening. The front central portion of the arrow pivots against the stop member **63** and the arrow comes out of the lower slot opening pivots against the stop member first as best shown in FIG. **18** with further movement by pulling down on the arrow releasing it from the upper slot projection and then the lower slot projection so that it will fall directly out onto the arrow rest of the bow. The rearward edge of the upper and lower support arms as indicated at **56***a* is recessed to permit the support body to rotate reversely to a sufficient degree when the support body is fully loaded and the forward edge is also slightly recessed to accommodate the leading arrow **52***a*. Upon release of the leading arrow the support body will automatically advance the next arrow against the support arms as best shown in FIGS. **15** and **17** and upon the removal of the last arrow the stop projection **61***a* engages the upper arm **64**.

Although the present invention has been described with a certain degree of particularity, it is understood that the present disclosure has been made by way of example and that changes in details of structure and system components may be made without departing from the spirit thereof.

What is claimed is:

1. A bow quiver for a bow comprising a support body means with a plurality of spaced apart elongated arrow support stations inclined obliquely to the axis of the support body means about a circle for receiving and releasably holding a plurality of arrows obliquely to the longitudinal axis of the support body means and to one another in a generally circular array around the support body means with the heads and fletched ends of adjacent of said arrows spaced apart from one another and a leading of said arrows in the removal position whereby a force applied to a leading arrow releasably removes it from said support body to a shooting position on a bow, a mount means for supporting the support body means for rotation on a bow and advancing means to automatically rotate support body means on the mount means to move another arrow to the removal position each time a leading arrow is removed.

2. A bow quiver as set forth in claim **1** wherein said mount means includes spaced upper and lower support arms at one end and a shaft between the support arms about which the support body means is freely rotatable.

3. A bow quiver as set forth in claim **1** wherein said advancing means include a spring secured to the shaft and to the body means to rotate the body on the shaft.

4. A bow quiver as set forth in claim **3** including a stop member on the rotary body means engageable with the mount means to limit the rotary movement of the body after all of the arrows have been removed.

5. A bow quiver as set forth in claim **1** wherein said support body means is a general cylindrical support member having obliquely arranged slots extending along and through the outer periphery of the body means and resilient means in each slot adapted to releasably grip a central portion of an arrow disposed therein.

6. A bow quiver as set forth in claim **5** wherein each of said slots includes an outwardly inclined lower edge in one slot wall and a beveled side edge centrally on the other slot wall to prevent binding of the arrow as it is pivoted out of the slot.

7. A bow quiver as set forth in claim **1** wherein said support body means is a generally cylindrical member having an intermediate base portion, upstanding end walls with offset, cooperative arrow receiving slots in the end walls and resilient means on the base portion to urge the arrows in the slotted against the slot walls to hold the arrows in place.

8. A bow quiver as set forth in claim **7** including stop members on the base portion against which the arrows are pivoted when moved through openings in the slots.

9. A bow quiver as set forth in claim **7** wherein the slots are defined by wall projections which extend outwardly at each end of the body means in opposite directions and terminate in spaced proximity to the back of adjacent wall projection thereby providing a pair of spaced, offset radially extending slot openings for each arrow.

10. A bow quiver as set forth in claim **9** wherein each of said wall projections has a recessed portion adjacent its terminal end against which a supported arrow is urged by the resilient means.

11. A rotary bow quiver for a bow comprising a support body means defining a plurality of spaced apart, circumferentially arranged and obliquely disposed elongated support stations to releasably hold the arrows obliquely to the axis of the support body means and to one another with the heads and fletched ends of adjacent arrows apart with a leading of the arrows being disposed in a removal position, a mount means for rotatably supporting the support body means on a bow said mount means having a force-applying means coupled between the mount means and the support body means for advancing the body means to a selected degree of rotation each time an arrow is removed from its support station.

12. A rotary bow quiver as set forth in claim **11** wherein said mount means has upper and lower support arms against which the leading arrow is moved by said force-applying means to hold the leading arrow firmly in place and thereby provide a stop for the support body means.

13. A rotary bow quiver for a bow comprising a generally cylindrical arrow support body having a plurality of spaced, circumferentially arranged, obliquely disposed arrow-receiving slots extending along the length of the body, said body having opposite walls, said slots having openings through the peripheral surface of the body and through the opposite walls thereof to define support stations to dispose the arrows obliquely to the axis of the body means and to one another in a circular array, a resilient means positioned centrally of each slot providing a releasable grip for a central portion of an arrow, the lead arrow being disposed in a removal position, a mount means for rotatably supporting the body for rotation about a central axis, said mount means including spaced upper and a lower support arms against which the lead arrow is disposed and a force-applying means coupled between the mount means and the support arm to advance the next arrow against the support arms each time a lead arrow is removed.

14. A rotary bow quiver for a bow comprising a generally cylindrical arrow-support member having an intermediate base portion and upstanding end wall, a plurality of spaced circumferentially arranged arrow-receiving slots extending through and around the periphery of the end walls said slots defining support stations to dispose each arrow obliquely to one another in a circular array and obliquely to the axis of the support member, a resilient member on the intermediate base portion which urges each arrow against the slotted end walls with a lead arrow being disposed in a removal position, a stop member positioned on the intermediate base portion adjacent the arrow against which the arrow is pivoted to move it out of the slots, a mount means for supporting the support member

for rotation about its longitudinal axis including spaced upper and lower support arms against which the lead arrow is disposed, a resilient force-applying means connected between the mount means and the support member for advancing each successive arrow against the support arms each time the lead arrow is removed.

15. A bow quiver for a bow having a centrally disposed handgrip portion comprising a plurality of arrows, a support body means with a plurality of circumferentially arranged spaced apart arrow support stations for slidably receiving and releasably gripping a central portion of each of said arrows, said arrow support stations arranged obliquely to one another and to the longitudinal axis of the support body means in a circular array, said arrows being disposed rearwardly of a bow with the points thereof down and with a lead arrow extending diagonally across a bow with the fletched end of the leading arrows in spaced proximity and to one side of a bow whereby a pulling force applied at its fletched end releasably discharges it from the body to drop into a launching position in a continuous downward movement.