A bow-and-arrow set includes a bow, a buffer, a string and an arrow. The bow includes a pipe inserted through an aperture defined therein. The buffer is located in the pipe. The string is tied to the bow. The arrow includes a pile, a pile and a body formed between the pile and the butt. The pile is movable in the pipe while the butt is movable against the string so that the string can shoot the arrow and move the pile within the pipe on releasing of the butt. The buffer can encounter and buffer the pile.
BOW AND ARROW

BACKGROUND OF INVENTION

[0001] 1. Field of Invention
The present invention relates to a bow and arrow and, more particularly, to a bow and arrow set with which an archer can practice arching without actually shooting an arrow away from a bow.

[0002] 2. Related Prior Art
Arching requires extreme concentration, skills in using wrists and arms, and stability of feet. It is an excellent sport for training a person's body and mind. This is evidenced by the inclusion of arching in the Olympic Games.

[0005] In arching, a body of an arrow is located against a bow. A butt of the arrow is located against a string tied to the bow. The butt of the arrow is moved against the string. Thus, the string is loaded. The arrow is shot by the string on releasing the butt. Later, a goal is hit with the arrow. A score can be read from the goal.

[0006] However, arching requires a large space to provide an adequate distance to travel of the arrow and to protect bystanders. Hence, arching can only be conducted in certain places, and only a few people are willing to learn arching.

[0007] Therefore, the present invention is intended to obviate or at least alleviate the problems encountered in prior art.

SUMMARY OF INVENTION

[0008] It is the primary objective of the present invention to provide a bow and arrow set with which an archer can arch in a small space.

[0009] To achieve the foregoing objective, the bow-and-arrow set includes a bow, a buffer, a string, and an arrow. The bow includes a pipe inserted through an aperture defined therein. The buffer is located in the pipe. The string is tied to the bow. The arrow includes a pile, a pile and a body formed between the pile and the butt. The pile is movable in the pipe while the butt is movable against the string so that the string can shoot the arrow and move the pile within the pipe on releasing the butt. The buffer can encounter and buffer the pile.

[0010] Other objectives, advantages and features of the present invention will become apparent from the following description referring to the attached drawings.

BRIEF DESCRIPTION OF DRAWINGS

[0011] The present invention will be described via detailed illustration of six embodiments referring to the drawings wherein:

[0012] FIG. 1 is a perspective view of a bow-and-arrow set according to the first embodiment of the present invention;

[0013] FIG. 2 is an exploded view of the bow-and-arrow set shown in FIG. 1;

[0014] FIG. 3 is a cut-away view of the bow-and-arrow set shown in FIG. 1;

[0015] FIG. 4 is a cross-sectional view of the bow-and-arrow set shown in FIG. 3, showing a string pulled and loaded;

[0016] FIG. 5 is a cross-sectional view of a bow-and-arrow set according to the second embodiment of the present invention;

[0017] FIG. 6 is a cross-sectional view of the bow-and-arrow set shown in FIG. 5, showing a string pulled and loaded;

[0018] FIG. 7 is a cross-sectional view of a bow-and-arrow set according to the third embodiment of the present invention;

[0019] FIG. 8 is a cross-sectional view of the bow-and-arrow set shown in FIG. 7, showing a string pulled and loaded;

[0020] FIG. 9 is a cross-sectional view of a bow-and-arrow set according to the fourth embodiment of the present invention;

[0021] FIG. 10 is an enlarged, partial view of the bow-and-arrow set shown in FIG. 9, showing a string pulled and loaded;

[0022] FIG. 11 is a cross-sectional view of a bow-and-arrow set according to the fifth embodiment of the present invention;

[0023] FIG. 12 is an enlarged, partial view of the bow-and-arrow set shown in FIG. 9, showing a string pulled and loaded;

[0024] FIG. 13 is a cross-sectional view of a bow-and-arrow set according to the sixth embodiment of the present invention;

[0025] FIG. 14 is an enlarged, partial view of the bow-and-arrow set shown in FIG. 13, showing a string pulled and loaded;

[0026] FIG. 15 is an enlarged, partial view of a bow-and-arrow set according to the seventh embodiment of the present invention.

DETAILED DESCRIPTION OF EMBODIMENTS

[0029] Referring to FIGS. 1 to 4, there is shown a bow-and-arrow set 100 according to a first embodiment of the present invention. The bow-and-arrow set 100 includes a bow 10, a buffer 20, a string 30 and an arrow 40. The buffer 20 is attached to the bow 10. The string 30 is tied to the bow 10. The arrow 40 is movable connected to the bow 10.

[0030] The bow 10 includes a handle 11, two limbs 12 and a pipe 13. The handle 11 is located between the limbs 12. The limbs 12 are made of an elastic material. An end of each of the limbs 12 is secured to an end of the handle 11. The pipe 13 is inserted through an aperture 111 defined in the handle 11. The pipe 13 is secured to the handle 11. The pipe 13 includes a channel 131 defined therein, a vent 132 at a first end of the channel 131, and an aperture 133 at a second end of the channel 131 opposite to the first end. The diameter of the channel 131 is larger than that of the vent 132. The diameter of the channel 131 is larger than that of the aperture 133.

[0031] The buffer 20 is located within the channel 131, near the vent 132. The diameter of the buffer 20 is larger than that of the vent 132. Hence, the buffer 20 cannot be removed from the channel 131 via the vent 132. The diameter of the buffer 20 is smaller than that of the channel 131, leaving a first gap between the buffer 20 and an internal side of the pipe 13. The first gap is in communication with the vent 132. The buffer 20 can be a block of an elastic material such as rubber and silicone. Alternatively, the buffer 20 can be a device such as a compression spring, an air bag and a pneumatic or hydraulic cylinder. The buffer 20 is a block of rubber in this embodiment.

[0032] The string 30 includes two ends each tied to another end of a related one of the limbs 12. The ends of the string 30 are tied to the limbs 12 after the limbs 12 are bent. Thus, the string 30 is loaded.

[0033] The arrow 40 includes a pile 41, a butt 42, a shaft 43 formed between the pile 41 and the butt 42, fletching 44
attached to the butt 42, a stop 45 formed between the butt 42 and the shaft 43, and a neck or recess 46 defined in the butt 42. The diameter of the pile 41 is larger than that of the shaft 43. The diameter of the stop 45 is also larger than that of the shaft 43.

[0034] The pile 41 is located in the channel 131, with the buffer 20 located between the pile 41 and the vent 132. The diameter of the pile 41 is smaller than that of the channel 131 so that the pile 41 is movable within the channel 131. The diameter of the pile 41 is larger than that of the aperture 133 so that the pile 41 cannot be removed from the channel 131 through the aperture 133.

[0035] The butt 42 and the stop 45 are located outside the channel 131, with the shaft 43 inserted through the aperture 133. The diameter of the stop 45 is larger than that of the aperture 133 so that the stop 45 cannot be moved into the channel 131 through the aperture 133. The diameter of the shaft 43 is smaller than that of the aperture 133, leaving a second gap between the shaft 43 and an annular edge within which the aperture 133 is defined.

[0036] An archer holds the handle 11 with a hand and holds the butt 42 with the other hand. The archer locates a section of the string 30 within the neck 46 beforehand to make sure that the butt 42 is located against the string 30. The archer pulls the butt 42, thus loading the string 30. The archer releases the butt 42 to shoot the arrow 40. The pile 41 moves within and along the channel 131 as the arrow 40 flies. As the pile 41 moves within the channel 131, some air is expelled from the channel 131 via the first gap and the vent 132 while other air is pumped into the channel 131 through the second gap. The use of the first and second gaps and the vent 132 are important. Otherwise, the pneumatic pressure would build up in a section of the pipe 13 near the first end, and vacuum would occur in another section of the pipe 13 near the second end. Such increase of the pneumatic pressure and such vacuum would interfere with the movement of the pile 41 within the channel 131. The pile 41 hits the buffer 20 just before the stop 45 hits the second end of the pipe 13. The arrow 40 is stopped.

[0037] Advantageously, the arrow 40 cannot be detached from the bow 10. The arrow 40 does not travel for a long distance and cannot but any one. Hence, it does not require a large space to arch with the bow-and-arrow set 100. The archer can train his or her body and mind almost anywhere, at any time.

[0038] Referring to FIGS. 5 and 6, there is shown a bow-and-arrow set 300 according to a second embodiment of the present invention. The second embodiment is like the first embodiment except including a front sight 60. The front sight 60 can be a mechanical front sight or laser-emitting front sight. The front sight 60 is useful in helping the archer aim at a target.

[0039] Referring to FIGS. 7 and 8, there is shown a bow-and-arrow set 400 according to a third embodiment of the present invention. The third embodiment is like the first embodiment except additionally including colored rings 72. The colored rings 72 are securely provided around the shaft 43 and evenly located along the shaft 43. An image-identifying system can be used to see the colored rings 72 and count the number of colored rings 72 located outside the pipe 13 to tell the value of a force exerted on the arrow 40. The colored rings 72 can be replaced with colored annular stripes in another embodiment.

[0040] Referring to FIGS. 9 and 10, there is shown a bow-and-arrow set 500 according to a fourth embodiment of the present invention. The fourth embodiment is like the first embodiment except additionally including a light 81 and a sensor 82. The light 81 is located on the pipe 13, near at the first end. The sensor 82 is located within the channel 131, near the first end of the pipe 13 and the buffer 20. The light 81 is electrically connected to the sensor 82. The sensor 82 can be a contact-type or non-contact-type sensor. The sensor 82 is a contact-type sensor such in this embodiment. On contacting the pile 41 moving from the buffer 20, the sensor 82 instructs the light 81 to emit red light. On contacting the pile 41 moving towards the buffer 20, the sensor 82 actuates the light 81 to emit green light. Thus, the status of the arrow 40 can be observed by the archer or any bystanders. The safety is improved. A piece of electronic equipment can be used to receive the light and determines the status of the arrow 40.

[0041] Referring to FIGS. 11 and 12, there is shown a bow-and-arrow set 600 according to a fifth embodiment of the present invention. The fifth embodiment is like the fourth embodiment except including a light-emitting element 91 instead of the light 81. The light-emitting element 91 is electrically connected to the sensor 82. On contacting the pile 41 moving towards the buffer 20, the sensor 82 actuates the light-emitting element 91 to emit a light beam for a short period of time. The light beam can be a laser. Thus, the archer knows how well he or she aims. Fun in arching is increased.

[0042] Referring to FIGS. 13 and 14, there is shown a bow-and-arrow set 700 according to a sixth embodiment of the present invention. The sixth embodiment is like the fifth embodiment except including a speaker 92 instead of the light-emitting element 91. The speaker 92 is electrically connected to the sensor 82. On contacting the pile 41 moving towards the buffer 20, the sensor 82 instructs the speaker 92 to provide music, a sound or an ultrasonic signal for a period of time set by the archer. A piece of electronic equipment must be used to detect the ultrasonic signal and show the status of the arrow 40. Thus, the archer knows the status of the arrow 40. Fun in arching is increased.

[0043] Referring to FIG. 15, there is shown a bow-and-arrow set according to a seventh embodiment of the present invention. The seventh embodiment is like the first embodiment except including colored annular areas 18 and 19 at the first end of the pipe 13. An electronic device has to be used to detect the colored annular areas 18 and 19 and let the archer know how well he or she aims.

[0044] The present invention has been described via the detailed illustration of the embodiments. Those skilled in the art can derive variations from the embodiments without departing from the scope of the present invention. Therefore, the embodiments shall not limit the scope of the present invention defined in the claims.

1. A bow-and-arrow set comprising:
   a bow (10) including an aperture (111) defined therein;
   a buffer (20) attached to the bow (10);
   a string (30) tied to the bow (10); and
   an arrow (40) movably connected to the bow (10), the
   arrow (40) including a pile (41), a butt (42) and a shaft
   (43) formed between the pile (41) and the butt (42),
   wherein the butt (42) is movable against the string (30)
   so that the string (30) can shoot the arrow (40) on releas-
   ing of the butt (42), wherein the buffer (20) can encoun-
   ter and buffer the arrow (40).

2. The bow-and-arrow set according to claim 1, wherein the
   bow (10) includes a pipe (13) inserted through the aperture
   (111), wherein the buffer (20) is located in the pipe (13),
wherein the pile (41) is movable in the pipe (13) while the butt (42) is movable against the string (30) so that the string (30) can shoot the arrow (40) to move the pile (41) within the pipe (30) on the releasing of the butt (42), wherein the buffer (20) can encounter and buffer the pile (41).

3. The bow-and-arrow set according to claim 2, wherein the pipe (13) includes a vent (132) via which air is expelled from the pipe (13) when the pile (41) moves towards the buffer (20).

4. The bow-and-arrow set according to claim 3, wherein the pipe (13) includes a channel (131) in communication with the vent (132), wherein the channel (131) includes a diameter larger than that of the vent (132).

5. The bow-and-arrow set according to claim 1, wherein the pile (41) includes a diameter larger than that of the shaft (43) and larger than that of the aperture (111) so that arrow (40) is kept on the bow (10).

6. The bow-and-arrow set according to claim 1, wherein the arrow (40) includes at least one fletching (44) attached to the butt (42).

7. The bow-and-arrow set according to claim 1, wherein the arrow (40) includes a stop (45) formed between the butt (42) and the shaft (43), wherein the stop (45) can abut the bow (40) to avoid insertion of the butt (42) through the aperture (111).

8. The bow-and-arrow set according to claim 1, wherein the arrow (40) includes a nock (46) for receiving a section of the string (30).

9. The bow-and-arrow set according to claim 1, further including a front sight (60) connected to the bow (10).

10. The bow-and-arrow set according to claim 1, further including colored rings (72) provided around the shaft (43).

11. The bow-and-arrow set according to claim 1, further including a light (81) connected to the bow (10) and a sensor (82) connected to the bow (10) electrically, wherein the sensor (82) instructs the light (81) to emit light on detecting the moving arrow (40).

12. The bow-and-arrow set according to claim 11, wherein the sensor (82) instructs the light (81) to emit light of a color on detecting the arrow (40) moving in a direction and instructs the light (81) to emit light of another color on detecting the arrow (40) moving in another direction.

13. The bow-and-arrow set according to claim 1, further including a light-emitting element (91) connected to the bow (10) and a sensor (82) connected to the light-emitting element (91) electrically, wherein the sensor (82) instructs the light-emitting element (91) to cast a light beam for a short period of time on detecting the moving arrow (40).

14. The bow-and-arrow set according to claim 1, further including a speaker (92) connected to the bow (10) and a sensor (82) connected to the speaker (92) electrically, wherein the sensor (82) instructs the speaker (92) to make a sound on detecting the moving arrow (40).

15. The bow-and-arrow set according to claim 1, wherein the bow (10) includes a handle (11) and two limbs (12) each connected to an end of the handle (11), wherein the aperture (111) is defined in the handle (11).

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