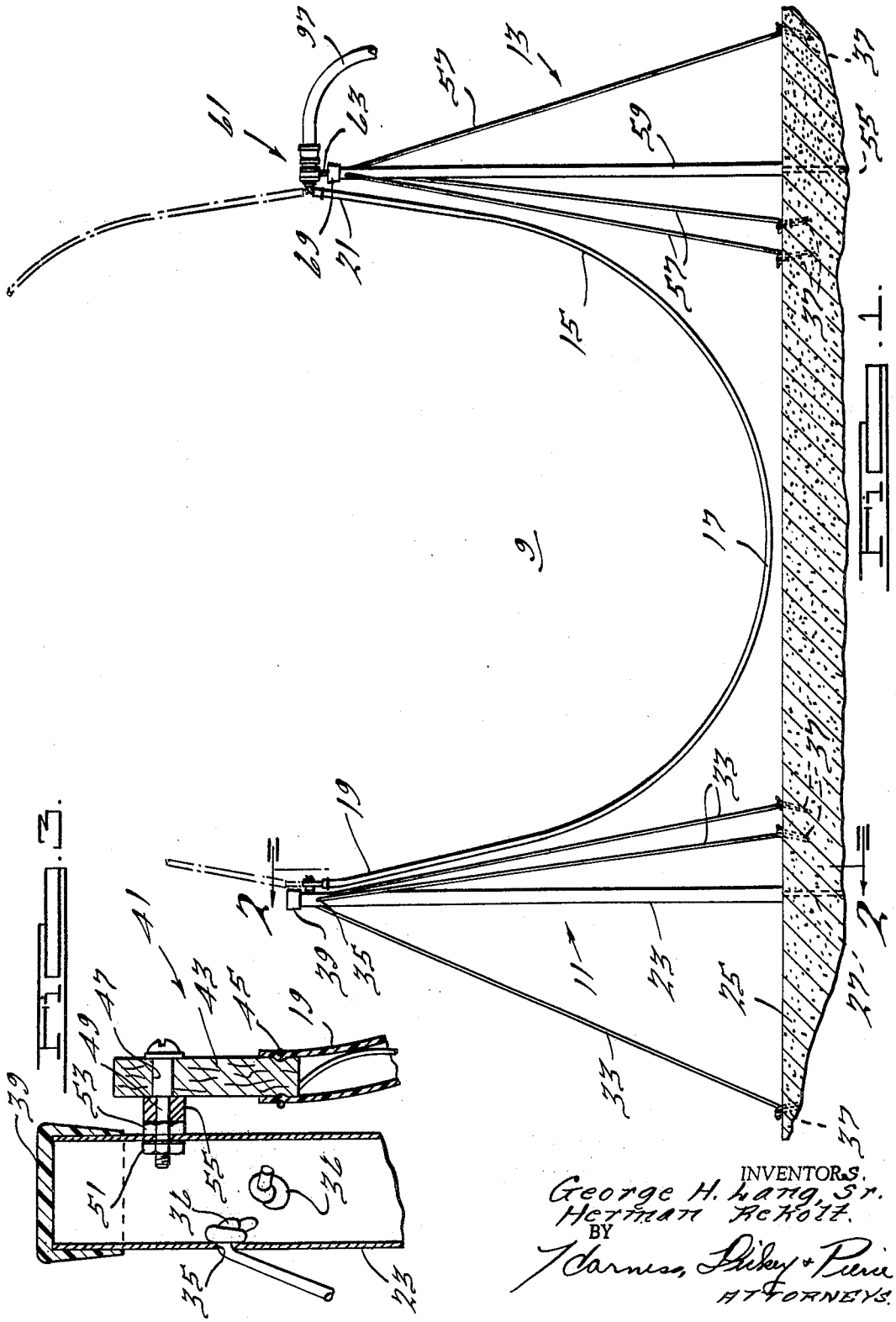
Dec. 2, 1969 G. H. LANG, SR., ET AL 3,481,600

WATER ACTUATED JUMP ROPE

Filed May 12, 1964 3 Sheets-Sheet 1



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WATER ACTUATED JUMP ROPE

Filed May 12, 1964 3 Sheets-Sheet 2

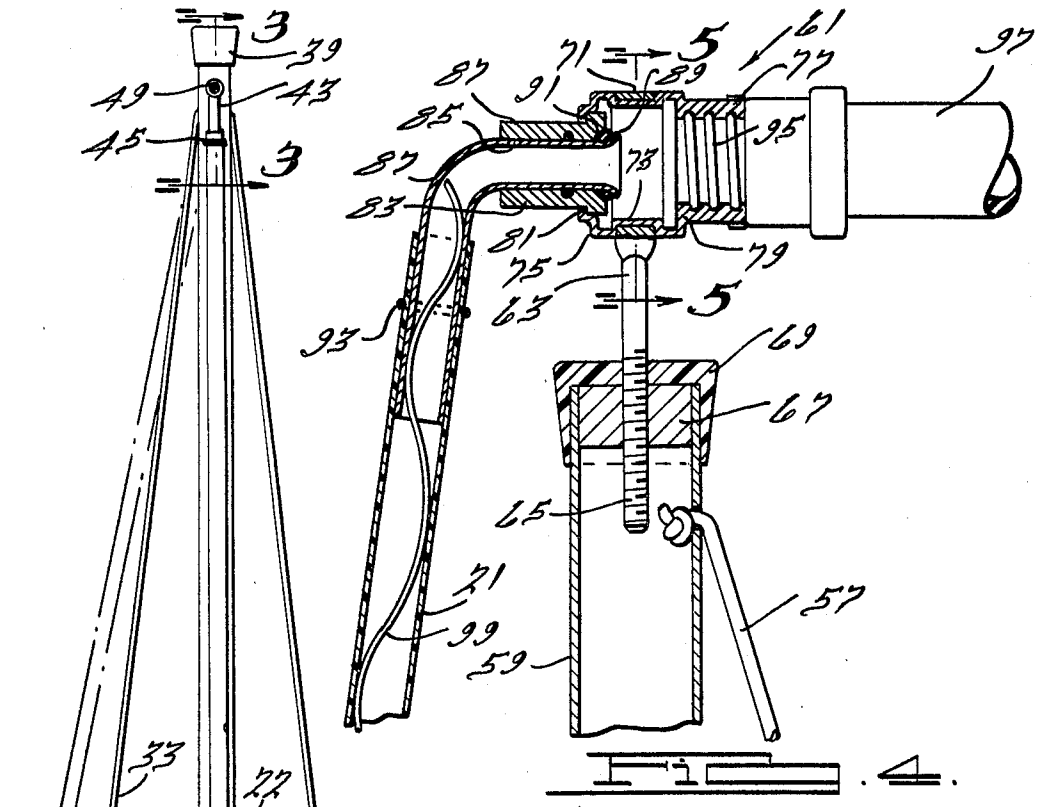


FIG. 4.

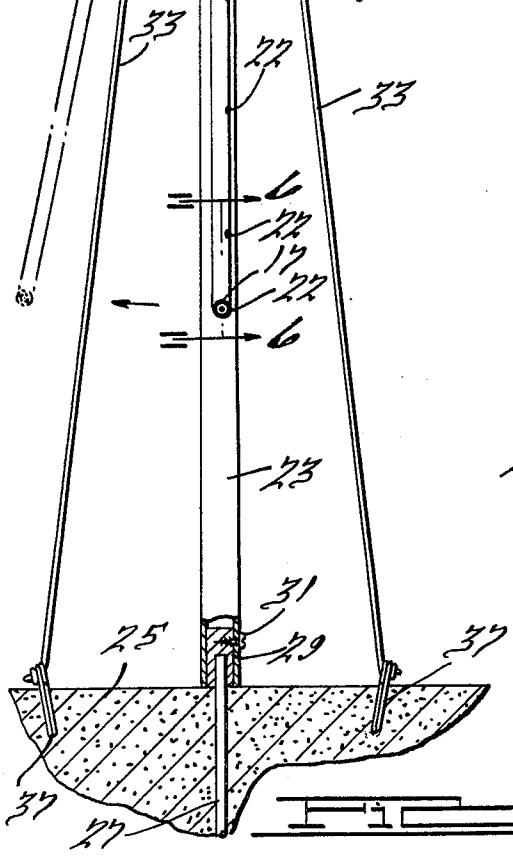


FIG. 2.

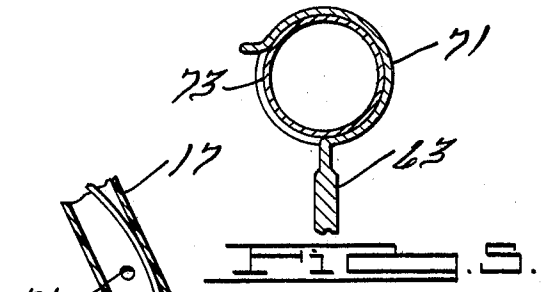


FIG. 5.

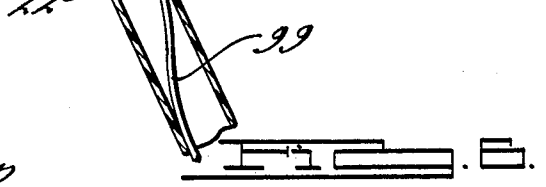


FIG. 6.

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WATER ACTUATED JUMP ROPE

Filed May 12, 1964 3 Sheets-Sheet 3

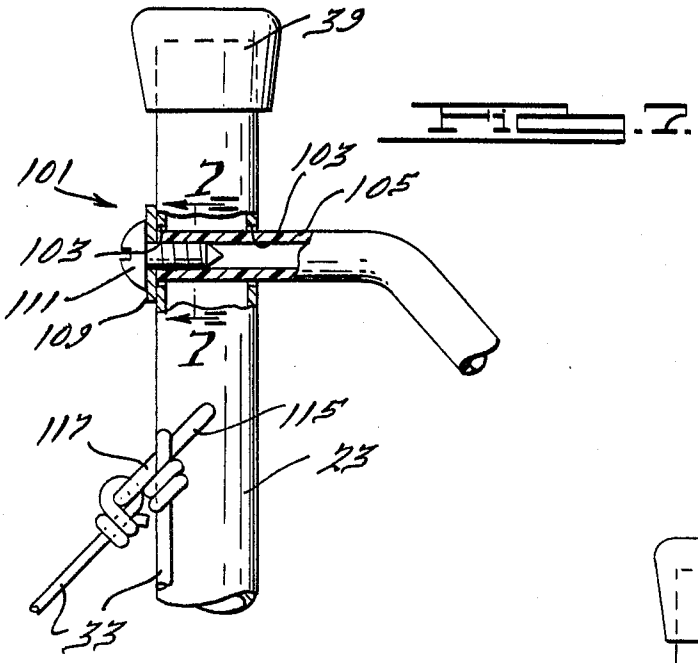


FIG. 1.

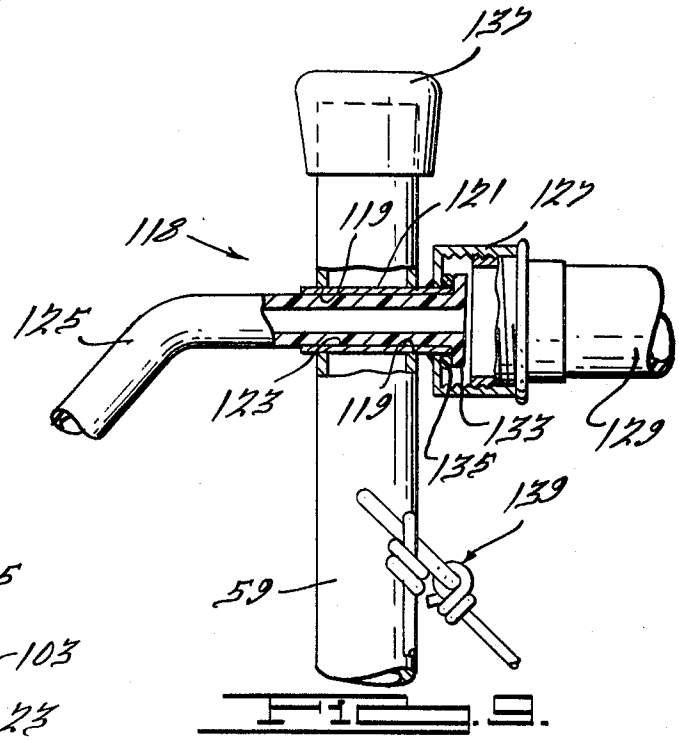


FIG. 3.

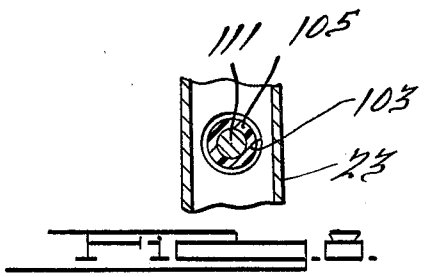


FIG. 2.

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3,481,600

WATER ACTUATED JUMP ROPE

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Int. Cl. A63b 5/20, 5/22
U.S. Cl. 272—74 12 Claims

ABSTRACT OF THE DISCLOSURE

A water actuated jump rope wherein pressurized fluid is directed through apertures formed in the wall of the hose portion thereof, the apertures being formed to be generally horizontally disposed when the hose is hanging downwardly and fluid escaping from the apertures create a generally tangential force to cause rotation of jump rope.

BACKGROUND AND SUMMARY OF THE INVENTION

This invention relates generally to jumping apparatus and the like for amusement and exercising purposes and more particularly to a fluid actuated jump rope that is adapted to be self supported.

In the conventional type of jump rope of the prior art, a rope is provided with a handle at each end and two persons stand separated from each other and turn the rope in a substantial circle near the ground. A third person then stands between the two and jumps over the rope. In this situation the enjoyment of the two persons at either end of the rope is substantially lessened because they are precluded from jumping rope themselves. Also, many times the other children in the vicinity of a child desiring to jump rope are preoccupied with other amusements and do not wish to participate in the rope jumping activity, thus leaving the child without someone to turn the rope. On the other hand, the child may be alone and desire to jump rope such as may occur on a farm, etc., and no children will be in the vicinity to turn the rope.

The instant invention is so designed as to be an improvement over the above described prior art by being self-actuated and further provides additional enjoyment and pleasure in its use by providing means for spraying the user with water while the rope is turning. Thus, the rope may be enjoyed by many youngsters without designating any of them to turn the rope or may be enjoyed by one youngster without having to depend on others to turn the rope. However, provisions have been made in the present invention to allow a youngster to disconnect one end of the rope from its stand and turn this end if it is desired that the water not be used.

Accordingly, it is an object of the present invention to provide an improved jump rope.

Another object of the present invention is to provide a jump rope that is self-actuated.

Another object of the present invention is to provide a jump rope that is free standing and self-actuated.

A further object of the present invention is to provide a jump rope that is rugged, sturdy and simple to use.

A still further object of the present invention is to provide a jump rope that is easy and inexpensive to manufacture.

Still another object of the present invention is to provide a jump rope, the enjoyment of which is greatly increased by the combination of its water spraying and self-actuated features.

Still another object of the present invention is to provide a jump rope that may be converted from a self-actuated to a manually actuated operation.

The foregoing objects are accomplished with the instant invention by a fluid-actuated jump rope unit, which is adapted to be used in conjunction with a jumping surface, comprising a tubular member which has a closed end and an open end. A connector assembly means is provided having coupling means for connecting the open end to a source of fluid under pressure and further includes means for rotatably supporting the open end relative to said coupling means. The assembly further includes a first means for rotatably supporting the closed end spaced from the jumping surface and a second means fixedly supporting the fluid connecting means relative to the jumping surface. Apertures are formed in the tubular member intermediate the ends thereof for providing motive power to rotate the tubular member relative to the first and second means when the fluid leaves the apertures.

Other objects, features and advantages of the present invention will become apparent from the subsequent description and the appended claims, taken in conjunction with the accompanying drawings, in which:

FIGURE 1 is a perspective view of a fluid-actuated jump rope embodying certain principles of the present invention;

FIGURE 2 is a side view of FIGURE 1 partially broken away and taken along line **2**—**2** thereof;

FIGURE 3 is a sectional view of the coupling mechanism of FIGURE 2 taken along line **3**—**3** thereof;

FIGURE 4 is a sectional view of the hose member connection of FIGURE 1;

FIGURE 5 is a sectional view of the support arm or eye of FIGURE 4 taken along line **5**—**5** thereof;

FIGURE 6 is a longitudinal sectional view of the tubular member of FIGURE 2 taken along line **6**—**6** thereof;

FIGURE 7 is a side view of a modification of the coupling mechanism illustrated in FIGURE 3;

FIGURE 8 is a sectional view of the fastener assembly of FIGURE 7 taken along line **7**—**7** thereof; and

FIGURE 9 is a side view of a modification of the hose member coupling mechanism illustrated in FIGURE 4.

Referring now to the drawings and particularly to FIGURES 1 and 2, there is generally illustrated a jump rope assembly **9** which comprises a pair of stand assemblies **11** and **13** for supporting a tubular member or jump rope **15** hanging in a substantial catenary therebetween. The jump rope **15** is formed of a tube of flexible material such as plastic or the like and has a central portion **17** and a pair of end portions **19** and **21**. The central portion **17** is provided with a set of apertures **22** therein which are so formed in a transverse outer edge thereof as to be always generally facing an opposite direction to that of the desired path of travel of the tubular member **15** when in use. It is to be understood that the apertures may be tilted in one direction or another for spraying purposes, but the general direction of a large portion of the water spray is as described above. The apertures **22** are for a purpose that will be more fully explained as the description proceeds.

The stand assembly **11** consists of a rigid pipe member **23** of tubular construction which is fixed to the ground **25** or other jumping surface by a spike **27** attached to the pipe member **23** and driven into the ground **25**. The spike **27** may be fastened to the pipe member **23** by attachment of the spike **27** to a wooden peg **29** in any suitable manner and then fastening the wooden peg **29** into the end of the pipe member **23** as by a sheet metal screw **31**. These details are best illustrated in FIGURE 2.

The pipe member **23** is held in the upright position by a plurality of guy ropes **33** which have one end thereof inserted into holes **35** and knotted, as at **36**, to prevent the end from slipping out of the hole **35**. The other ends of the guys **33** are fixed to the ground **25** by attaching the ends to pegs **37** which are then pounded into the ground **25**. The pegs **37** are illustrated as being fabricated of steel or other metal but they may be made of wood or any suitable rigid material. It is to be noted that the spread of the guys **33** is sufficient to rigidly support the pipe member **23** in the upright position and care must be taken that the pegs **37** are not placed too close to pipe member **23**. The uppermost portion of the pipe member **23** is provided with a plastic cap **39** which is inserted over the end thereof to preclude the entry of water, dirt, etc., into the interior of the pipe member **23** which may be unfinished, thereby preventing rusting or other damage to the pipe member **23**.

As illustrated in phantom in FIGURES 1 and 2, tubular member **15** is adapted to rotate about the ends **19, 21** to circumscribe a substantial sphere above the ground in the conventional manner. To accomplish this action, ends **19, 21** are rotatably supported on their respective stand assemblies **11, 13** and motive power is supplied as will be hereinafter explained. Referring particularly to FIGURE 3, there is illustrated a rotatable connector **41** which rotatably supports end **19** in a substantially parallel plane relative to pipe member **23**. End **19** is closed off, hereinafter referred to as the closed end, by a peg member **43** inserted therein. A wire ring **45** is tightly fastened over a point where the end **19** and peg member **43** overlap, thus securing the two elements together. The peg member **43** is formed with an aperture **47** therein which is adapted to receive a mounting bolt **49** therethrough. The bolt **49** is fastened to pipe member **23** by means of a pair of nuts **51, 53** and a bushing element **55** is interposed between nut **53** and peg **43** to allow the peg **43** to freely rotate on bolt **49**.

The stand assembly **13** is identical in construction to that of stand assembly **11** in the manner in which it is fastened to the ground, as by rod **55**, and in the guy ropes **57** provided to hold the assembly vertical. However, a slightly modified pipe member **59** has been utilized to accommodate a rotating connector assembly **61** which rotatably fastens end **21** to stand assembly **13**.

Referring particularly to FIGURES 4 and 5, wherein there is illustrated the connector assembly **61** rigidly mounted to pipe member **59** by means of an eye bolt **63**. The eye bolt **63** is provided with a threaded end **65** which threadably engages a plug member **67** pressed into pipe member **59**. A plastic cap **69** also threadably engages the end **65** and fits over the upper end of pipe member **59** to prevent the entry of water, dirt, etc., as described in connection with pipe member **23**. The other end of eye bolt **63** is formed with an open eye portion **71** which engages a recessed portion **73** of connector **61** as best illustrated in FIGURE 5.

The recessed portion **73** is formed intermediate ends **75, 77** of a tubular housing member **79** forming the outer shell of the coupling **61**. The end **75** is bent inwardly to form a radial lip **81** which serves to retain a bearing member **83** therein. The bearing member **83** is formed with a hollow bore **85** which receives a generally L-shaped tubular connector **87**. The connector **87** is swaged at the upper end **89** thereof and coacts with a metal O-ring **91** to prevent the connector **87** from being pulled through the bore of bearing member **83** through the rough use of the assembly by children. The connector **87** is so dimensioned as to enable it to be inserted into the end **21** of tubular member **15** and fastened thereto as by a wire fastener **93** in a manner similar to the attachment of end **19** to peg **43**.

The end **77** is formed with threads **95** on it inside periphery and is adapted to threadably engage the threaded male end of a hose **97**. The hose **97** is adapted to be connected to a source of fluid under pressure such as a residential water supply, but it is to be understood that any fluid may be used such as a colored gas under pressure or the like.

Thus it is seen from the above description, the source of pressurized fluid is in direct fluid communication with the interior of tubular member **15** through a passage defined by hose **97**, hollow connector **61**, L-shaped connector **87** and into tubular member **15**. As was stated above, tubular member **15** is provided with a plurality of apertures **22** which are formed from the hollow interior thereof through the wall of tubular member **15** to the atmosphere. Thus the fluid flowing in the tubular member **15** will meet the closed end **19** and force the fluid out through the apertures **22** due to the pressure created in the member **15**.

This escaping fluid is the median used to supply the motive power to turn the rope **15** when it is in use. Therefore, the direction of the apertures **22** is of importance in utilizing the greatest force to turn the rope **15**. The greatest force available is when the apertures face a direction exactly opposite to the desired direction of travel of the rope. When the rope **15** is hanging in its inactive position, this direction coincides with a plurality of horizontal lines through each of the apertures. With this direction of apertures, the line of force of the escaping fluid on the rope **15** will always be tangential to the circle described by each of the apertures as the rope **15** is rotated about its ends **19, 21**.

Rope **15** is normally fabricated of a material which is sufficiently stiff that it may be formed to hang in the catenary described above. Thus the curve at the central portion **17** is gradual to allow the greatest freedom of movement of the users while jumping rope. However, to insure the proper curve of the rope in the case of extremely flexible materials or an unbalance of forces should some of the apertures become clogged, a length of wire is inserted into the interior of the rope **15** and extends from closed end **19** to open end **21**. The wire **99** has been preformed into the desired curve or may be made sufficiently flexible to assume the desired curve.

In operation, the stand assemblies **11** and **13** are set up with the rope **15** hanging therebetween. One end of a garden hose **97** may be attached to a connector **61** and the other end to a source of water under pressure. As the water is turned on, the pressure of the water will force a spray from the apertures **22** and the rope **15** will begin to turn. When the proper speed has been reached, the first child may begin jumping rope and enjoy the spray of the water. If it is desired that the rope be used without the water spray, the hose **97** may be disconnected from the connector assembly **61** which in turn will be released from eye bolt **71**. A child may then hold connector assembly **61** in his hand and turn the rope for the others to enjoy. On the other hand, if control of the action of the rope **15** is desired, the connector **61** may be removed from the stand **13** and the rope **15** turned while the hose **97** is still attached.

Referring particularly now to FIGURES 7 and 8 of the drawing, there is illustrated a coupling mechanism **101** which is a modification of the closed connection **41** of FIGURE 3. In the modified form, the stand **23** is formed with a through hole **103** which is adapted to receive the horizontal end of a portion of flexible tubing **105** formed of plastic, nylon or like material. The tubing **105** may be suitably fastened to tubular member **15**

(FIGURE 1) but it is to be understood that tubing **105** may be formed as tubular member **15** and serve as the jump rope. In this latter situation, the tube **105** will be formed with the desired caternary form as described above and the wire member **99** may be eliminated. As is seen in FIGURE 7, the tube **105** is formed with an angle of approximately 135° as it has been found that the proper form is assumed by the jump rope for the rotational operation of the rope **15**.

In securing the tube **105** to the pipe member **23**, the tube **105** is inserted through the holes **103** and a fastener assembly comprising a washer **109** and a self tapping screw **111** is applied. It is to be noted that the screw is threaded directly into the material of the tube **105** and serves the double function of sealing the end of tube **105** as described above and fastens the tube **105** to the pipe member **23**.

Thus it is seen that the tube **105** is free to rotate directly in the holes **103** formed in tubular member **23** without the requirement of a complex rotatable coupling. The operation of the coupling mechanism **101** is identical to that of **41** with the exception that a more unitary structure is formed. The cap **39** is provided for the purpose described in conjunction with FIGURE 3.

A modification of the guy ropes **33** is also illustrated in FIGURE 7 in that a ring **115** has been passed through a portion of the pipe member **23** to leave a loop **117** outside the pipe member **23**. The guy ropes **33** may be attached to the loop as illustrated and anchored as described in conjunction with FIGURE 1. Thus the attachment of the guy ropes **33** is simplified over the arrangement shown in FIGURE 3.

If it is desired to control the operation of the rope by hand, the screw **111** and washer **109** may be removed and the tube **105** extracted from the pipe member **23**. On replacement of the screw **111** and washer **109**, the fluid may then be passed through the apertures **22** described above and the rope may be turned fast or slow by hand.

Referring now to FIGURE 9, there is illustrated a modification of modified coupling **118** which is the hose connection **61** shown in FIGURE 1. In this modification, the pipe member **59** is formed with a through hole **119**, into which is press-fitted or otherwise fixed a bearing member **121**. Thus a bearing shaft **123** is formed to rotatably receive a second plastic or nylon tube **125**. It is to be understood that tube **125** may be the other end of tube **105** in the case where the tubes **105** and **125** and jump rope **15** are formed of a single piece of tubing.

A hose coupling **127** is welded or otherwise suitably attached to a bearing **121** and forms a means by which a fluid hose **129** or the like may be attached to the tube **125**. Thus an actuating fluid may be conducted to the jump rope through the coupling **118**. The end of tube **125** has been provided with a flange **133** and an O-ring **135** which serves to prevent tube **125** from slipping out of bearing tube **121**. It has been found that many synthetic materials such as plastics and the like will form such a flange **133** by an application of heat thereto, thus eliminating the need for special forming machinery.

A plastic cap **137** has been provided to seal the end of the pipe member **59** and a guy rope assembly **139** has also been provided as described in conjunction with FIGURE 7. Thus applicant has provided a greatly simplified jump rope assembly which is inexpensive to manufacture and simple to operate.

While it will be apparent that the preferred embodiment of the invention disclosed is well calculated to fulfill the objects above stated, it will be appreciated that the invention is susceptible to modification, variation and change without departing from the proper scope or fair meaning of the subjoined claims.

What is claimed is:

1. A fluid-powered jump rope comprising in combination:

a looped tubular member having aperture means directed generally in a horizontal direction when said looped tubular member is in its lowermost position for discharging fluid in a direction substantially tangent to the path of rotation of said looped tubular member with sufficient force to rotate said tubular member;

a pair of spaced support members;

mounting means for rotatably securing the ends of the tubular member to the support members; and

means for directing a fluid under pressure into the tubular member at one end thereof to rotate the tubular member about an axis adjacent the ends thereof in response to the fluid flowing therefrom through the aperture means.

2. The improvement of claim **1** wherein said aperture means includes a plurality of holes spaced axially on said tubular member.

3. The improvement of claim **1** wherein said directing means further includes means for starting rotation of said tubular member under the influence of said pressurized fluid.

4. The improvement of claim **1** wherein said pressurized fluid varies the speed of said tubular member from standstill to a maximum jumping speed dependent on the maximum pressure of said fluid.

5. The improvement of claim **1** wherein said mounting means includes connector assembly means having coupling means fixed relative to one support member for connecting said one end to a source of fluid pressure and means rotatably supported relative to said coupling means for rotatably supporting said one end relative to said coupling means, and plug means sealably engaging the other end for preventing the escape of fluid from said other end.

6. A fluid actuated jump rope unit adaptable for use with a jumping surface comprising a generally looped tubular member adapted to be rotated about an axis of rotation and having a closed end and an open end, connector assembly means having coupling means for connecting said open end to a source of fluid under pressure, said connector assembly means further including means for rotatably supporting said open end relative to said coupling means, first means for rotatably supporting said closed end spaced from the jumping surface, second means for supporting said coupling means spaced from the jumping surface, and said tubular member further having spaced aperture means formed intermediate the ends thereof and being disposed to exert a tangential component of force for providing motive power to rotate said tubular member relative to said first and second means about said axis when the pressurized fluid leaves said aperture means.

7. The improvement of claim **6** wherein said tubular rotated relative to said first and second means when fluid leaves said apertures.

8. The improvement of claim **6** wherein said first means includes a first stand assembly having a vertical pole member and said second means includes a second stand assembly having a vertical pole member, said tubular member being rotated relative to said first and second stand assemblies.

9. The improvement of claim **8** wherein said connector assembly means includes a coupler and a tubular member rotatably connected at one end thereof to said coupler and at the other end thereof to said open end for rotatably supporting said open end relative to said coupler.

10. The improvement of claim **9** wherein said first stand assembly includes a connector attached to said pole member for rotatably supporting said closed end spaced from the jumping surface and in a substantially vertical plane, and said second assembly includes means attached at the upper end of said vertical pole member for supporting said coupler spaced from the jumping surface.

11. The improvement of claim 8 wherein said tubular member forms a substantial catenary and wherein said second stand assembly includes an aperture and a bushing member fixed in said aperture for rotatably supporting said open end, and wherein said hose portion includes said spaced apertures formed in a transverse outward surface.

12. The improvement of claim 11 further including plug means having a flange thereon for sealing said closed end to the escape of fluid and retaining said closed end in an aperture formed in said first stand assembly.

References Cited

UNITED STATES PATENTS

2,426,603	9/1947	Freygang	239—263
3,013,798	12/1961	Willoughby	272—74
3,107,916	10/1963	Cooper	272—74

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U.S. Cl. X.R.

239—251, 261, 263, 264, 566, 567