United States Patent

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[54] RECREATIONAL ROPE-TYPE ARTICLE

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[52] **U.S. Cl.** **272/60,** 182/190, 272/75

[51] **Int. Cl.** **A63b 5/20,** A63b 7/04

[58] **Field of Search** ..... 182/190; 63/2, 3; 272/75, 74, 272/60, 57, 1, 85; 193/35; 114/219 R

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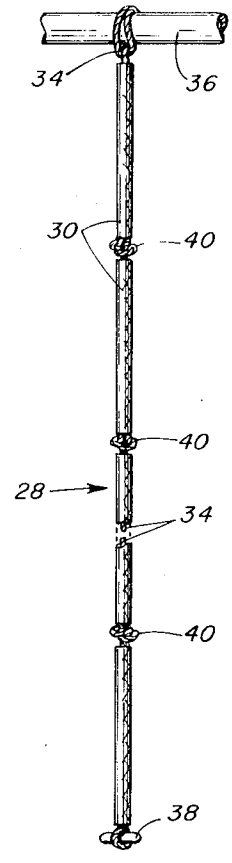
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[57] **ABSTRACT**

A semiflexible rope-type article comprises a multiplicity of rigid elements spaced along substantially its entire length, with nonrigid connecting segments therebetween. In certain embodiments, sleeves provide the rigid elements, and a rope or wire cable, upon which the sleeves are mounted, provides the connecting segments. Alternatively, the rigid elements and connecting segments may be provided by relatively large and relatively small cross section portions of the article. Knots tied in a rope, end handles or parts securing the rigid and flexible portions together may be relied upon to limit axial movement of the rigid elements, and to maintain them in proximity to one another.

19 Claims, 6 Drawing Figures



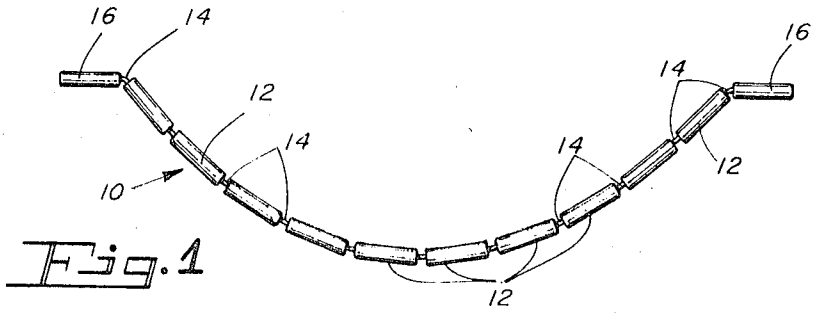


Fig. 1

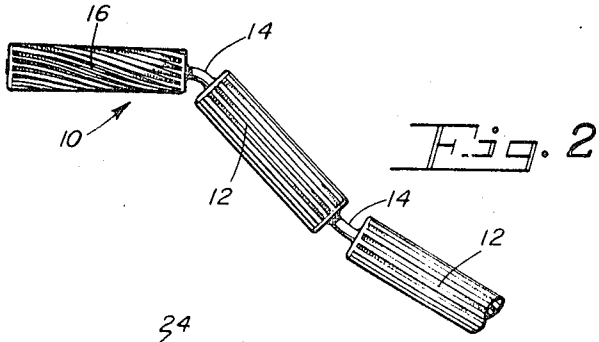


Fig. 2

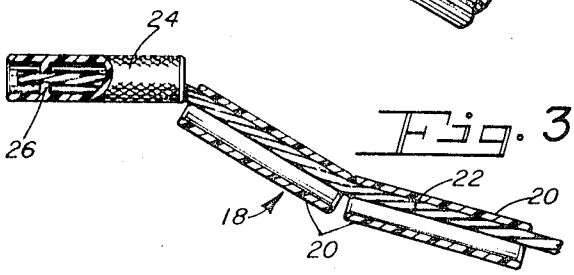


Fig. 3

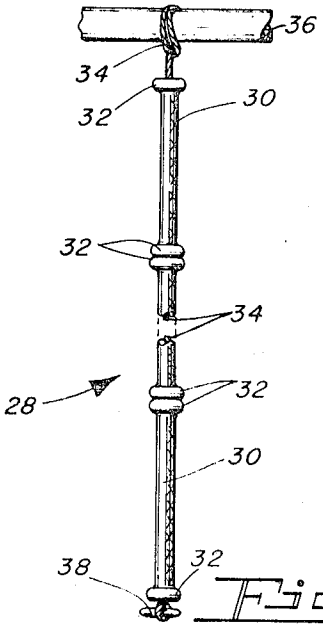


Fig. 4

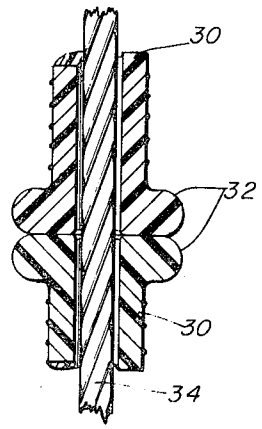


Fig. 5

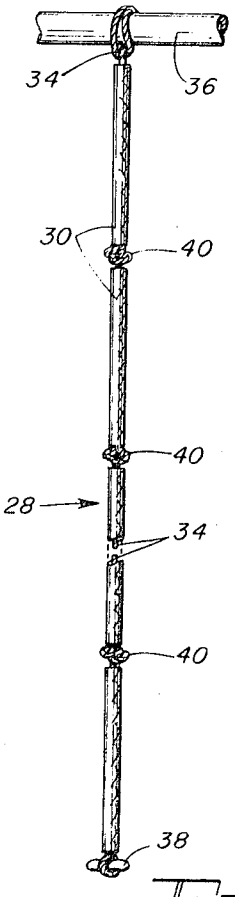


Fig. 6

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RECREATIONAL ROPE-TYPE ARTICLE

BACKGROUND OF THE INVENTION

The flexibility of conventional recreational ropes, cables, and the like (used, for example, as jump ropes, climbing ropes, swing supports, etc.) presents a hazard to children whose playmates often lack sufficient maturity to employ good judgment in their use. Furthermore, such flexible members (hereinafter referred to generically as ropes) present a constant danger of accidental injury, or even death, because they can easily become looped or twisted about the neck of a child while at play. Although it is obvious that some flexibility is necessary in such ropes, in most instances the degree thereof can be reduced without detracting from the recreational function of the rope and it is desirable to do so in view of the safety benefits that can be afforded thereby.

Accordingly, it is the principal object of the present invention to provide a rope-type article that is of limited flexibility to afford a relatively safe recreational device. Another object is to provide such an article that is relatively simple and inexpensive to produce and affords recreational advantages in addition to its safety features.

SUMMARY OF THE INVENTION

It has now been found that the foregoing and related objects can be readily attained in a thin, elongated, semiflexible rope-type article comprising a multiplicity of rigid elements, each at least about 3 inches long, spaced axially along substantially the entire length of the article. Adjacent rigid elements are axially joined to one another by nonrigid connecting segments, and means is provided for limiting axial movement of the rigid elements and limiting the effective length of each of the connecting segments to less than about 2 inches. At least the extremities of each of the segments are relatively angularly displaceable to permit relative angular movement of the rigid elements, hereby rendering the article semiflexible.

In the preferred embodiments of the invention, each of the rigid elements is at least about 4 inches long, and the limiting means limits the effective length of each of the connecting segments to less than about 1 inch. The rigid elements may be cylindrical sleeves, and the connecting segments may be provided by an elongated flexible member passing through and between the sleeves of the article.

A climbing rope may be provided in accordance with the invention wherein one end of an elongated flexible member is adapted to be secured to overhead support means such a pipe or bar, from which the article may depend vertically. The other end of the flexible member, which may desirably be a wire cable, has a restraining element secured thereto, and the restraining element at least in part provides the limiting means. Preferably, each of the rigid elements in such a climbing rope is at least about 2 feet long and has a relatively rough exterior surface to facilitate secure gripping thereof. A restraining element may be fixed on each of the connecting segments between adjacent rigid elements to provide at least part of the limiting means and, if the elongated flexible member is a rope, the restraining elements may be knots tied therein. Alternatively, the adjacent ends of the rigid elements may in abutting contact and configured to substantially prevent telescoping thereof; preferably, ends of the rigid elements are of larger cross section than the intermediate portions thereof.

In another embodiment a jump rope is provided by a multiplicity of sleeves and an elongated flexible member passing therethrough, the flexible member having a handle secured adjacent each end thereof to provide the limiting means. Alternatively, the sleeves may be secured in fixed positions upon the elongated flexible member with adjacent leaves separated by less than about 2 inches and with the means securing the sleeves providing the limiting means for the article.

In a further embodiment of the invention, each of the connecting segments is a short flexible element extending between adjacent rigid elements and secured thereto, with the means securing the rigid elements to the flexible elements providing the limiting means. The article may comprise a unitary member fabricated of a material that is rigid in relatively large cross section and flexible in relatively small cross section; a multiplicity of relatively large cross section portions provide the rigid elements and a plurality of relatively cross section portions provide the connecting segments therebetween. The material employed may be a synthetic thermoplastic polymer, and the article may be fabricated as a continuous extrudate thereof. Preferably, the rigid elements are generally cylindrical and the connecting segments, interspersed therebetween, are less than about one inch in length. A rigid element adjacent each end of the article may have striations formed helically thereabout to provide handles, thus providing a jumping rope.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 illustrates a jump rope embodying the present invention;

FIG. 2 is a fragmentary view of the jump rope of FIG. 1, to a greatly enlarged scale, more clearly showing the structure thereof;

FIG. 3 is a fragmentary sectional view of another embodiment of the present invention for use as a jump rope;

FIG. 4 is a fragmentary elevational view of a climbing rope embodying the invention supported upon a fragmentarily illustrated bar;

FIG. 5 is a fragmentary sectional view to a greatly enlarged scale of a portion of the climbing rope of FIG. 4; and

FIG. 6 is a fragmentary elevational view of another embodiment of the present invention used as a climbing rope.

DETAILED DESCRIPTION OF THE ILLUSTRATED EMBODIMENTS

Turning now in detail to FIGS. 1 and 2 of the appended drawing, a jump rope, generally designated by the numeral 10, consists of a multiplicity of surface striated cylindrical rigid elements 12 alternating with relatively short flexible connectors 14. A handle 16 is provided at each end of the rope 10 and, as can be seen in FIG. 2, the striations thereof are helically twisted to afford a secure grip.

A second form of jump rope, generally designated by the numeral 18, is fragmentarily illustrated in FIG. 3, and consists of a multiplicity of rigid hollow cylinders 20 through which is threaded a length of conventional rope 22. The jump rope 18 has knurled handles 24 at each end thereof (only one of which is shown) within which an annular collar 26 engages the end of the rope 22 to secure it to the handle 24. It will be appreciated that the overall appearance of the jump rope of FIG. 3 is generally that shown in FIG. 1.

As will be appreciated, the elements serving as handles may be furnished by rigid elements formed at the ends of the article or they may be added as separate members. The handles can conveniently be made temporarily securable so that, in the case of sleeves, such sleeves can be added or removed to vary the effective length of the rope. Attachment of handles by temporary means is also advantageous because such an arrangement permits the spacing between the sleeves to be minimized by adjustment of the position of the handles.

With reference now to FIGS. 4 and 5, a climbing rope, generally designated by the numeral 28, consists of a multiplicity of elongated generally cylindrical plastic sleeves, which have enlarged knuckle portions 32 at the ends thereof. A length of rope 34 is threaded through the sleeves 30 and is looped at its upper end about a supporting bar or pipe 36. A peg 38 is secured at the lower end of the rope 34 to maintain the sleeves 30 thereon. As will be apparent, one function of the knuckles 32 is to provide areas of reinforcement and high-structural strength at the joint between two sleeves 30 to prevent endwise splitting and passage of the sleeves 30 into one another. The knuckles 32 also aid climbing of the rope 28 by providing hand and foot support at regular intervals along

its length. A ball-and-socket structure type of construction could be substituted for the knuckles **32** illustrated, if so desired.

The climbing rope **28** illustrated in FIG. **6** is similar to that illustrated in FIG. **5**, except that the knuckles **32** are absent and the rope **34** is tied at intervals along its length to provide a multiplicity of knots **40** between adjacent sleeves. These knots cooperate with the peg **38** at the lower end to maintain the sleeves **30** in substantially fixed locations, and otherwise serve a function similar to that of the knuckles **32**. As can be seen, the outer surfaces of the sleeves **30** are knurled or roughened to afford a desirable grip for climbing.

The safety of the articles of the invention resides primarily in the relationship between the rigid and nonrigid elements present therein, and it will be appreciated that the greater the ratio of rigid to nonrigid lengths the more rigid, and therefore the safer, the resultant article will be. The basic objective is to provide a semiflexible article that is free of any portion capable of readily looping in a small radius to encircle the neck. Thus, the rigid and nonrigid elements must be relatively dimensioned so that the article cannot be wrapped about the neck without producing angular spaces into which the fingers or a hand can be inserted, or toward which the windpipe may be turned, for relief and protection. Ideally, the portions of the article are dimensioned so that angular displacement of adjacent rigid elements is restricted; for example, this can occur if the length of a nonrigid segment is less than the combined radii of the two rigid elements that it joins, since the rigid elements will thereby interfere with one another at a given angular relationship. However, this is not essential to the attainment of the objects of the invention. The specific lengths of the elements will depend somewhat upon the degree of rigidity that can be tolerated in the particular type of device involved. For example, articles used for climbing and support need be considerably less flexible than those used for jumping, and thus can readily be designed to provide maximum safety by utilizing rigid elements that are 2 feet or more in length. On the other hand, in jump ropes and the like, it is desirable to achieve an optimum balance between flexibility and safety. Normally, rigid sections shorter than 3 inches will not provide the requisite degree of safety, and elements longer than about 1 foot tend to produce a structure that is unduly cumbersome or inflexible for use as a jump rope. Accordingly, in such a device, the preferred length for the rigid elements is about 4 to 8 inches.

With regard to the nonrigid segments, these should not exceed about **2** inches in length for safety purposes, and preferably they are about 1 inch or less. Normally, the longer the rigid elements the longer may be the nonrigid segments with adequate safety, but segments in excess of about 2 inches are generally unsatisfactory even when the rigid elements are quite long. It is important to the attainment of the objectives of the invention that the rigid elements of the articles be spaced along substantially the entire length thereof so that no flexible segment is present at which looping can readily occur. Although lengths of nonrigid segments greater than about 2 inches may be tolerable at the ends of the article where leverage is difficult to obtain, preferably there is no nonrigid section in excess of about 2 inches at any location along the entire length of the article.

As will be appreciated from the foregoing description, there are basically two types of articles encompassed by the present invention. One type is comprised of a series of hollow sleeves which are threaded upon an elongated flexible member, such as a conventional rope or cable. The other type consists of rigid elements (that may be either hollow or solid) interconnected by relatively short, nonrigid elements. In the first type of structure the means limiting axial movement of the hollow sleeves along its length may be provided by handles or other members affixed to the ends of the article to limit relative movement of the sleeves. Alternatively, limiting means may be provided within the nonrigid segments between the sleeves to maintain them in a substantially fixed position on the flexible member; for example, the limiting means may be provided by a collar or bead that is clamped to the flexible member or, when a rope is employed, the limiting means may simply be a knot or series of knots tied therein. The sleeves may also be independently secured to the flexible member in fixed locations, such as by associated clamping portions, pins, rivets, etc., they may be bonded to the member with a suitable adhesive or the like.

When the rigid elements are interconnected by short nonrigid elements, the rigid elements will inherently be maintained in fixed positions relative to one another (except for a small amount of "play" that may be provided in the nonrigid elements themselves). In such a case, the limiting means may be considered to be the means by which the nonrigid elements are connected to the rigid elements, and once again this may be by pinning, clamping, bonding, etc.; if the rigid and nonrigid portions are formed as a unitary member, as has been described hereinbefore, the limiting means is considered to be that which joins the portions to one another.

The material out of which the articles of the invention are fashioned may vary considerably. For example, sleeves and collars may be fabricated of metal, wood, or plastic, and elongated flexible elements may be provided by conventional ropes of natural or synthetic fibers, wire cables, etc. From the standpoint of manufacturing feasibility and cost, synthetic thermoplastic materials will be most desirable. Thus, they can readily be fabricated into elements that are rigid but not brittle, and they can be used for both short and elongated nonrigid segments or members; the thermoplastics can also be extruded directly into unitary articles, as has been mentioned hereinbefore. Moreover, thermoplastic resins are desirable from the standpoint of appearance, since they may have patterned surfaces, they may be brightly colored and the elements may be produced with striations or the like of different colors for unique effects.

It will be appreciated that the terms "rigid" and "nonrigid" are inherently somewhat relative because rigid elements that resist some level of force will normally deform at higher levels. However, the foregoing description will make it clear that, as used herein, the rigid elements must resist bending under at least the amount of force that the average child is capable of exerting manually; preferably the level of rigidity will be higher to better ensure against accidental injury. The nonrigid segments should be sufficiently flexible so that the article will deform under its own weight if positioned horizontally.

Thus, it can be seen that the present invention provides rope-type articles that are of limited flexibility to afford relatively safe recreational devices. The articles of the invention are relatively simple and inexpensive to produce, and they may afford recreational advantages in addition to their safety features.

Having thus described the invention, I claim:

1. A thin, elongated, semiflexible rope-type article comprising a multiplicity of cylindrical sleeves, each at least about 3 inches long, spaced axially along substantially the entire length of said article, a rope passing through and between said sleeves and providing unitary nonrigid connecting segments joining adjacent sleeves axially to one another; and means limiting axial movement of said sleeves and limiting the effective length of each of said connecting segments to less than about 2 inches, said effective length of each of said connecting segments also being less than the combined radial dimension of said adjacent rigid elements joined thereby, at least the extremities of each of said segments being relatively angularly displaceable to permit relative angular movement of said sleeves, and the dimensions of said sleeves and connecting segments causing interference at a given angular relationship between said adjacent sleeves to render said article semiflexible, one end of said rope being adapted to be secured to overhead support means and the other end thereof having a restraining element secured thereto and at least in part providing said limiting means, said article thus being adapted to depend vertically from the support means to provide a climbing

rope, knots tied in said rope providing a restraining element on each of said connecting segments between adjacent sleeves and providing at least part of said limiting means.

2. A thin, elongated, semiflexible rope-type article comprising a multiplicity of cylindrical sleeves, each at least about 2 feet long, spaced axially along substantially the entire length of said article and having a relatively rough exterior surface to facilitate secure gripping thereof; an elongated flexible member passing through and between said sleeves and providing nonrigid connecting segments joining adjacent sleeves axially to one another; and means limiting axial movement of said rigid elements and limiting the effective length of each of said connecting segments to less than about 2 inches, at least the extremities of each of said segments being relatively angularly displaceable to permit relative angular movement of said rigid elements to render said article semiflexible, one end of said flexible member being adapted to be secured to overhead support means and the other end thereof having a restraining element secured thereto and at least in part providing said limiting means, said article thus being adapted to depend vertically from the support means to provide a climbing rope.

3. The article of claim 2 wherein said sleeves are secured in fixed positions upon said elongated flexible member, with adjacent sleeves separated by less than about 2 inches, the means securing said sleeves providing said limiting means.

4. The article of claim 2 wherein a restraining element is fixed on each of said connecting segments between adjacent rigid elements to provide at least part of said limiting means.

5. The article of claim 4 wherein said elongated flexible member is a rope and wherein said restraining elements are knots tied therein.

6. The article of claim 2 wherein said elongated flexible member is a wire cable.

7. The article of claim 2 wherein the adjacent ends of said sleeves are in abutting contact, and wherein at least the adjacent ends of said sleeves are configured cooperatively to substantially prevent telescoping thereof.

8. The article of claim 7 wherein adjacent ends of said sleeves are of larger cross section than the intermediate portions thereof.

9. The article of claim 2 wherein said sleeves are secured in fixed positions upon said elongated flexible member, with adjacent sleeves separated by less than about two inches, the means securing said sleeves providing said limiting means.

10. A thin, elongated, semiflexible rope-type article comprising a multiplicity of cylindrical sleeves, each at least about 3 inches long, spaced axially along substantially the entire length of said article, a rope passing through and between said sleeves and providing unitary nonrigid connecting segments joining adjacent sleeves axially to one another; and means limiting axial movement of said sleeves and limiting the effective length of each of said connecting segments to less than about 2 inches, said effective length of each of said connecting segments also being less than the combined radial dimensions of said adjacent rigid elements joined thereby, at least the extremities of each of said segments being relatively angularly displaceable to permit relative angular movement of said sleeves, and the dimensions of said sleeves and connecting segments causing interference at a given angular relationship between said adjacent sleeves to render said article semiflexible, one end of said rope being adapted to be secured to overhead support means and the other end thereof having a restraining element secured thereto and at least in part providing said limiting means, said article thus being adapted to depend vertically from the support means to provide a climbing rope, the adjacent ends of said sleeves being in abutting contact and being of larger cross section than the intermediate portions of said sleeves to substantially prevent telescoping thereof.

11. The article of claim 10 wherein each of said sleeves is at least about 2 feet long and has a relatively rough exterior surface to facilitate secure gripping thereof.

12. The article of claim 10 wherein a restraining element is fixed on each of said connecting segments between adjacent sleeves to provide at least part of said limiting means.

13. The article of claim 12 wherein said elongated flexible member is a rope and wherein said restraining elements are knots tied therein.

14. A thin, elongated, semiflexible rope-type article comprising a unitary member fabricated of a material that is rigid in relatively large cross section and flexible in relatively small cross section, said unitary member having a multiplicity of relatively large cross section portions providing a multiplicity of rigid elements, each at least about 3 inches long, spaced axially along substantially the entire length of said article; a plurality of relatively small cross section portions of said member providing short, flexible connecting segments extending between adjacent rigid elements and secured thereto to join said adjacent rigid elements axially to one another; and means securing said rigid elements to said flexible elements to limit axial movement of said rigid elements and to limit the effective length of each of said connecting segments to less than about 2 inches, said effective length of each of said connecting segments also being less than the combined radial dimensions of said adjacent rigid elements joined thereby, at least the extremities of each of said segments being relatively angularly displaceable to permit relative angular movement of said rigid elements, and the dimensions of said rigid elements and connecting segments causing interference at a given angular relationship between said adjacent rigid elements to render said article semiflexible.

15. The article of claim 14 wherein each of said rigid elements is at least about 4 inches long and wherein said limiting means limits the effective length of each of said connecting segments to less than about 1 inch.

16. The article of claim 14 wherein said elongated flexible member has a handle secured thereto adjacent each of the opposite ends thereof, said handles providing said limiting means and said article being a jump rope.

17. The article of claim 14 wherein said material is a synthetic thermoplastic polymer.

18. The article of claim 17 wherein said article is integrally formed, unitary member.

19. The article of claim 18 wherein said rigid elements are generally cylindrical and wherein said connecting segments therebetween are each less than about 1 inch in length, a plurality of said rigid segments being formed with axially extending grooves about the circumference thereof and a rigid element adjacent each end of said article having grooves helically formed thereabout to provide handles, said article being a jump rope.

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