ELASTIC CORD UNIT FOR PULL EXERCISER

Inventor: Ying-Ching Wu, An-Ding Shiang (TW)

Correspondence Address:
KAMRATH & ASSOCIATES P.A.
4825 OLSON MEMORIAL HIGHWAY, SUITE 245
GOLDEN VALLEY, MN 55422 (US)

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ABSTRACT
An elastic cord unit includes a hollow outer elastic cord having a first longitudinal hole and two ends. Two first stops are respectively and securely received in the ends of the outer elastic cord. A hollow inner elastic cord is received in the outer elastic cord and includes a second longitudinal hole. Two ends of the inner elastic cord are respectively received in the first stops. Two second stops are respectively received in the ends of the inner elastic cord. Each end of the inner elastic cord is securely clamped between one of the first stops and one of the second stops. When the outer elastic cord breaks while a user is stretching the elastic cord unit, the inner elastic cord does not break to avoid injury to the user.

ELASTIC CORD UNIT FOR PULL EXERCISER

BACKGROUND OF THE INVENTION

[0001] The present invention relates to an elastic cord unit and, more particularly, to an elastic cord unit for a pull exerciser avoiding injury a user when the elastic cord is broken during use.

[0002] Pull exercisers utilizing elastic cords allow exercise of muscles of the breast and arms of a user. These pull exercisers are light, small, and easy to carry and, thus, an option to modern people who like to exercise whenever they want.

[0003] A typical elastic cord of a pull exerciser is hollow and attached between two handles. Exercise effect in the muscles of the breast and arms of a user can be attained when the user holding the handles repeatedly stretches and releases the elastic cords. However, with reference to FIG. 1, when a user 1 holds the handles 101 of a conventional pull exerciser 10 and stretches the elastic cord 102, the elastic cord 102 could break and injure the user 1.

[0004] A need exists for an elastic cord for an exerciser that would not injure the user when it breaks during use.

BRIEF SUMMARY OF THE INVENTION

[0005] According to a first aspect of the present invention, an elastic cord unit includes a hollow outer elastic cord having a first longitudinal hole and two ends. Two first stops are respectively and securely received in the ends of the outer elastic cord. A hollow inner elastic cord is received in the outer elastic cord and includes a second longitudinal hole. Two ends of the inner elastic cord are respectively received in the first stops. Two second stops are respectively received in the ends of the inner elastic cord. Each end of the inner elastic cord is securely clamped between one of the first stops and one of the second stops.

[0006] In the most preferred form, the outer elastic cord has an elastic coefficient larger than that of the inner elastic cord. Each first stop includes a through-hole receiving one of the second stops and has an enlarged section. Each first stop further includes a first larger section having an outer diameter larger than that of the first larger section. Each second stop includes a second larger section having an outer diameter larger than that of the outer diameter of the first larger section. The second larger section of each second stop is received in the first larger section of one of the first stops. The second smaller section of each second stop is received in the first smaller section of one of the first stops. Each end of the inner elastic cord includes an inner section, a turnback section, and a turnback section with the inner section as a single continuous monolithic piece, with the turnback section facing and extending outside and surrounding the inner section, and with the turnback section having a length larger than that of each of the two ends, and with the turnback section and the inner section being securely clamped between the one of the first stops and one of the second stops. The outer elastic cord further includes a first intermediate portion between the two ends thereof. The inner elastic cord further includes a second intermediate portion between the two ends thereof. The second intermediate portion is received in and spaced from the first intermediate portion.

[0007] According to a second aspect of the present invention, an elastic cord unit includes a hollow outer elastic cord having a longitudinal hole and two ends. Two stops are respectively and securely received in the ends of the outer elastic cord. Each stop includes a through-hole having an enlarged section. Each stop further includes a larger section having an outer diameter larger than that of each end of the outer elastic cord. The enlarged section of the through-hole is formed in the larger section. An inner elastic cord is received in the outer elastic cord and includes a second longitudinal hole and two ends. Each end of the inner elastic cord extends through the through-hole of one of the stops and includes a knotted portion having a maximum width larger than a diameter of the through-hole. The knotted portion of each end of the inner elastic cord is received in the enlarged section of the through-hole of one of the stops.

[0008] In the most preferred form, the outer elastic cord has an elastic coefficient larger than that of the inner elastic cord. The outer elastic cord further includes a first intermediate portion between the two ends thereof. The inner elastic cord further includes a second intermediate portion between the two ends thereof. The second intermediate portion is received in and spaced from the first intermediate portion. Each end of the outer elastic cord includes an inner section, a turnback section, and a turnback section with the inner section as a single continuous monolithic piece, with the turnback section facing and extending outside and surrounding the inner section, and with the turnback section having a length larger than that of each stop.

[0009] When the outer elastic cord breaks while a user is stretching the elastic cord unit, the inner elastic cord does not break to avoid injury to the user.

[0010] The present invention will become clearer in light of the following detailed description of illustrative embodiments of this invention described in connection with the drawings.

DESCRIPTION OF THE DRAWINGS

[0011] The illustrative embodiments may best be described by reference to the accompanying drawings where:

[0012] FIG. 1 shows a schematic view of a user and a conventional pull exerciser with an elastic cord of the pull exerciser broken during use.

[0013] FIG. 2 shows a perspective view of a pull exerciser utilizing an elastic cord unit of a first embodiment according to the preferred teachings of the present invention.

[0014] FIG. 3 shows a side view of the elastic cord unit of FIG. 2.

[0015] FIG. 4 shows a partial, exploded view of the elastic cord unit of FIG. 2 before assembly.

[0016] FIG. 5 shows a partial, cross-sectional view of the pull exerciser of FIG. 2 after assembly.

[0017] FIG. 6 shows a schematic view of a user utilizing the pull exerciser of FIG. 2 with the elastic cord unit broken during use.

[0018] FIG. 7 shows a side view of an elastic cord unit of a second embodiment according to the preferred teachings of the present invention.
FIG. 8 shows a partial, exploded view of the elastic cord unit of FIG. 7 before assembly. [0020] FIG. 9 shows a partial, cross-sectional view of the pull exerciser of FIG. 7 after assembly. [0021] FIG. 10 shows a perspective view of another pull exerciser utilizing the elastic cord unit according to the preferred teachings of the present invention. [0022] FIG. 11 shows a perspective view of a further pull exerciser utilizing a plurality of elastic cord units according to the preferred teachings of the present invention. [0023] All figures are drawn for ease of explanation of the basic teachings of the present invention only; the extensions of the Figures with respect to number, position, relationship, and dimensions of the parts to form the preferred embodiment will be explained or will be within the skill of the art after the following teachings of the present invention have been read and understood. Further, the exact dimensions and dimensional proportions to conform to specific force, weight, strength, and similar requirements will likewise be within the skill of the art after the following teachings of the present invention have been read and understood. Furthermore, when the terms “first”, “second”, “end”, “portion”, “section”, “longitudinal”, “outward”, “backward”, “length”, “width”, and similar terms are used herein, it should be understood that these terms have reference only to the structure shown in the drawings as it would appear to a person viewing the drawings and are utilized only to facilitate describing the invention.

DETAILED DESCRIPTION OF THE INVENTION

[0025] An elastic cord unit of a first embodiment according to the preferred teachings of the present invention is shown in FIGS. 2-6 of the drawings and generally designated 2. In an example shown in FIG. 2, the elastic cord unit 2 is utilized with a pull exerciser 30 of the type including two hollow handles 301 and two belts 302 each extending through one of the hollow handles 301, with two ends of each belt 302 sewn together and defining a positioning hole 303 for coupling with the elastic cord unit 2. [0026] According to the preferred form shown, the elastic cord unit 2 includes an outer elastic cord 21 having a longitudinal hole 210 and an inner elastic cord 22 received in the longitudinal hole 210 of the outer elastic cord 21. Each of the inner and outer elastic cords 22 and 21 is made of resilient material and capable of returning to its original length when stretched and then released. The inner and outer elastic cords 22 and 21 have different elastic coefficients. In the most preferred form shown, the elastic coefficient of the outer elastic cord 21 is larger than that of the inner elastic cord 22 such that the inner elastic cord 22 has larger elongation than the outer elastic cord 21 under the same stretching force. [0027] According to the preferred form shown, the outer elastic cord 21 includes first and second ends 211 and 212 and a stretchable intermediate section 213 between the first and second ends 211 and 212. The inner elastic cord 22 has an outer diameter smaller than the diameter of the longitudinal hole 210 of the outer elastic cord 21 and is spaced from an inner periphery of the longitudinal hole 210. The inner elastic cord 22 includes first and second ends 221 and 222 respectively positioned in the first and second ends 211 and 212 of the outer elastic cord 21 and a stretchable intermediate section 223 between the first and second ends 221 and 222. In the most preferred embodiment shown, a hollow stop 23 is mounted in each end 211, 212 of the outer elastic cord 21. Each stop 23 includes a through-hole 231 through which one of the first and second ends 221 and 222 of the inner elastic cord 22 extends. The through-hole 231 has an enlarged section 234. Each stop 23 further includes a larger section 232 having an outer diameter larger than that of the first and second ends 211 and 212 of the outer elastic cord 21 and a smaller section 233 having an outer diameter the same as or slightly larger or smaller than an inner diameter of the longitudinal hole 210 of the outer elastic cord 21. The enlarged section 234 of the through-hole 231 is formed in the larger section 233. Each of the first and second ends 221 and 222 of the inner elastic cord 22 is knotted to form a knotted portion 224 having a maximum width larger than the diameter of the through-holes 231 of the stops 231 and approximately equal to the diameter of the enlarged sections 234 of the stops 231 after passing through the through-hole 231 of one of the stops 23. Thus, the first and second ends 221 and 222 of the inner elastic cord 22 are respectively positioned in the first and second ends 211 and 212 of the outer elastic cord 21. The intermediate portion 223 of the inner elastic cord 22 is also stretched when the intermediate portion 213 of the outer elastic cord 21 is stretched. It can be appreciated that the knotted portion 224 of each of the first and second ends 221 and 222 of the inner elastic cord 22 is partially received in the enlarged section 234 of the through-hole 231 of one of the stops 23, and the whole knotted portion 224 of each of the first and second ends 221 and 222 of the inner elastic cord 22 is received in one of the first and second ends 211 and 212 of the outer elastic cord 21.

In assembly, each of the first and second ends 211 and 212 of the outer elastic cord 21 is extended through the positioning hole 303 of one of the belts 302. One of the stops 23 are inserted into one of the first and second ends 211 and 212 of the outer elastic cord 21 before extending the outer elastic cord 21 through the positioning holes 303 of the belts 302, and the other stop 23 is inserted into the other end 211, 212 of the outer elastic cord 21 after extending the outer elastic cord 21 through the positioning holes 303 of the belts 302. It can be appreciated that the first and second ends 211 and 212 of the outer elastic cord 21 receiving the stops 23 are bulged and will not disengage from the positioning holes 303 of the belts 302 after the elastic cord unit 2 passes through the positioning holes 303. According to the most preferred form shown, each of the first and second ends 211 and 212 includes an inner section 215, a turnback section 214, and a turn 216 integrally connecting the turnback section 214 with the inner section 215 as a single continuous monolithic piece, with the turnback section 214 facing outward and extending outside and surrounding the inner section 215, with the turnback section 214 having a length larger than that of the stop 23, and with the turnback section 214 being engaged in and extending through the positioning hole 303 of one of the belts 302. Thus, the stops 23 can be reliably positioned in the first and second ends 211 and 212 of the outer elastic cord 21. The turnback sections 214 can be easily obtained by turning the ends 211 and 212 of the outer elastic cord 21 outward and backward.

With reference to FIG. 6, in a case that the outer elastic cord 21 breaks while a user 1 is holding the handles 301 and stretching the elastic cord unit 2, the inner elastic cord 22 will not break, for the elastic coefficient of the inner elastic
cord 22 is smaller than that of the outer elastic cord 21. Injury to the user 1 is thus, avoided even if the outer elastic cord 21 breaks during use.

[0030] FIGS. 7 through 9 show an elastic cord unit 2 of a second embodiment according to the preferred teachings of the present invention. Only the differences between the first and second embodiments are described. According to the preferred form shown in FIGS. 7-9, the inner elastic cord 22 is hollow and includes a longitudinal hole 220. Another stop 24 is mounted in each stop 23 and includes a larger section 241 having an outer diameter larger than the through-hole 231 of the stop 231 but smaller than the outer diameter of and received in the enlarged section 234 of the through-hole 231 of the stop 23. The stop 24 further includes a smaller section 242 received in the smaller section 233 of the stop 23.

[0031] According to the most preferred form shown, each of the first and second ends 221 and 222 of the inner elastic cord 22 includes an inner section 227, a turnback section 225, and a turn 226 integrally connecting the turnback section 225 with the inner section 227 as a single continuous monolithic piece, with the turnback section 225 facially abutting and extending outside and surrounding the inner section 227, with the turnback section 225 having a length larger than that of the stop 24, and with the turnback section 225 and the inner section 227 being securely clamped between the stops 23 and 24. It can be appreciated that the stops 24 can be reliably positioned in the stops 23. The turnback sections 225 can be easily obtained by turning the ends 221 and 222 of the inner elastic cord 22 outward and backward. Similar to the first embodiment, injury to the user is avoided even if the outer elastic cord 21 breaks during use, for the inner elastic cord 22 having an elastic coefficient smaller than that of the outer elastic cord 21 will not break.

[0032] FIG. 10 illustrates use of the elastic cord unit 2 according to the preferred teachings of the present invention with a pull exerciser 40 of the type including two hollow handles 401, two loop-like belts 402 respectively extending through the handles 401, two engaging members 403, and two attachment members 408. Each attachment member 408 includes a loop portion 404 and a tubular portion 405 to which one of the first and second ends 211 and 212 of the outer elastic cord 21 is attached. Each engaging member 403 is attached to one of the belts 402 and includes a hook 406 and a resilient plate 407 that can be pressed to allow engagement/ disengagement of the loop portion 404 of one of the attachment members 408 with/from the hook 406, allowing easy assembly and detachment of the elastic cord unit 2. An example of such a pull exerciser 40 is disclosed in U.S. Pat. No. 7,077,793, the entire contents of which are incorporated herein by reference.

[0033] FIG. 11 illustrates use of a plurality of elastic cord units 2 according to the preferred teachings of the present invention with a pull exerciser 50 of the type including two hollow handles 501, two loop-like, length-adjustable belts 502 respectively extending through the handles 501, and two positioning devices 503. Each positioning device 503 includes two positioning plates of positioning holes 505 each of which is in communication with outside via a reduced opening 506. An example of the positioning device 5 is disclosed in U.S. Pat. No. 6,676,576, the entire contents of which are incorporated herein by reference. Each of the first and second ends 211 and 212 of the outer elastic cord 21 of each elastic cord unit 2 can be inserted into one of the positioning holes 505 via the associated reduced opening 506, allowing easy assembly.

[0034] It can be appreciated that the elastic cord unit 2 according to the preferred teachings of the present invention can be utilized with exercisers of various types to avoid injury to the user from breakage of the elastic cord unit 2.

[0035] Thus since the invention disclosed herein may be embodied in other specific forms without departing from the spirit or general characteristics thereof, some of which forms have been indicated, the embodiments described herein are to be considered in all respects illustrative and not restrictive. The scope of the invention is to be indicated by the appended claims, rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are intended to be embraced therein.

1. An elastic cord unit comprising:
   a hollow outer elastic cord including a first longitudinal hole and two ends;
   two first stops respectively and securely received in the two ends of the outer elastic cord;
   a hollow inner elastic cord received in the outer elastic cord and including a second longitudinal hole, with the inner elastic cord further including two ends respectively received in the two first stops; and
   two second stops respectively received in the two ends of the inner elastic cord, with each of the two ends of the inner elastic cord being securely clamped between one of the two first stops and one of the two second stops.

2. The elastic cord unit as claimed in claim 1, with the outer elastic cord having an elastic coefficient larger than that of the inner elastic cord.

3. The elastic cord unit as claimed in claim 1, with each of the two first stops including a through-hole receiving one of the two second stops and having an enlarged section, with each of the two first stops further including a first larger section having an outer diameter larger than that of each of the two ends of the outer elastic cord, with the enlarged section of the through-hole being formed in the first larger section, with each of the two first stops further including a first smaller section having an outer diameter smaller than that of the first larger section, with each of the two second stops including a second larger section having an outer diameter larger than a diameter of the through-hole and larger than an outer diameter of each of the two ends of the inner elastic cord but smaller than the outer diameter of the first larger section, with each of the two second stops further including a second smaller section having an outer diameter smaller than that of the second larger section, with the second larger section of each of the two second stops being received in the first larger section of one of the two first stops, and with the second smaller section of each of the two second stops being received in the first smaller section of one of the two first stops.

4. The elastic cord unit as claimed in claim 3, with the outer elastic cord further including a first intermediate portion between the two ends thereof, with the inner elastic cord further including a second intermediate portion between the two ends thereof, and with the second intermediate portion being received in and spaced from the first intermediate portion.

5. The elastic cord unit as claimed in claim 3, with each of the two ends of the inner elastic cord including an inner section, a turnback section, and a turn integrally connecting the turnback section with the inner section as a single continuous monolithic piece, with the turnback section facially
abutting and extending outside and surrounding the inner section, with the turnback section having a length larger than that of each of the two second stops, and with the turnback section and the inner section being securely clamped between the one of the two first stops and one of the two second stops.

6. The elastic cord unit as claimed in claim 3, with each of the two ends of the outer elastic cord including an inner section, a turnback section, and a turn integrally connecting the turnback section with the inner section as a single continuous monolithic piece, with the turnback section facially abutting and extending outside and surrounding the inner section, and with the turnback section having a length larger than that of each of the two first stops.

7. The elastic cord unit as claimed in claim 4, with each of the two ends of the outer elastic cord including an inner section, a turnback section, and a turn integrally connecting the turnback section with the inner section as a single continuous monolithic piece, with the turnback section facially abutting and extending outside and surrounding the inner section, and with the turnback section having a length larger than that of each of the two first stops.

8. An elastic cord unit comprising:
   a hollow outer elastic cord including a longitudinal hole and two ends;
   two stops respectively and securely received in the two ends of the outer elastic cord, with each of the two stops including a through-hole having an enlarged section, with each of the two stops further including a larger section having an outer diameter larger than that of each
   of the two ends of the outer elastic cord, with the enlarged section of the through-hole being formed in the larger section; and
   an inner elastic cord received in the outer elastic cord and including a second longitudinal hole and two ends, with each of the two ends of the inner elastic cord extending through the through-hole of one of the two stops and including a knotted portion having a maximum width larger than a diameter of the through-hole, with the knotted portion of each of the two ends of the inner elastic cord being received in the enlarged section of the through-hole of one of the two stops.

9. The elastic cord unit as claimed in claim 8, with the outer elastic cord having an elastic coefficient larger than that of the inner elastic cord.

10. The elastic cord unit as claimed in claim 8, the outer elastic cord further including a first intermediate portion between the two ends thereof, with the inner elastic cord further including a second intermediate portion between the two ends thereof, and with the second intermediate portion being received in and spaced from the first intermediate portion.

11. The elastic cord unit as claimed in claim 9, with each of the two ends of the outer elastic cord including an inner section, a turnback section, and a turn integrally connecting the turnback section with the inner section as a single continuous monolithic piece, with the turnback section facially abutting and extending outside and surrounding the inner section, and with the turnback section having a length larger than that of each of the two stops.

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