July 6, 1965 LE VELL DE SPAIN ETAL 3,193,288

PHYSICAL CONDITIONING DEVICE HAVING ELASTIC STRANDS

Filed Sept. 11, 1962

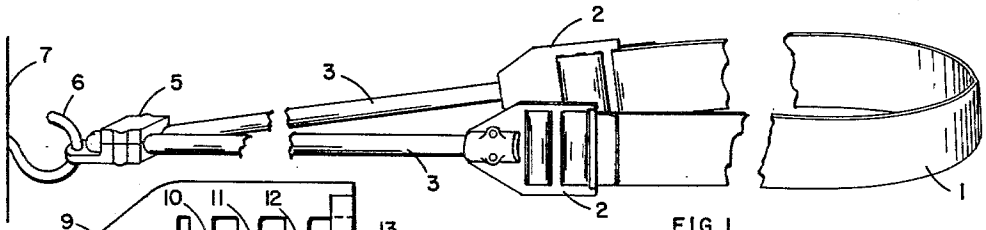


FIG. 1

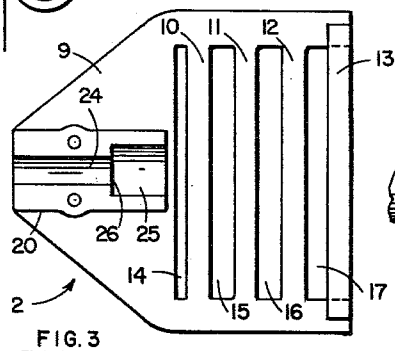


FIG. 3

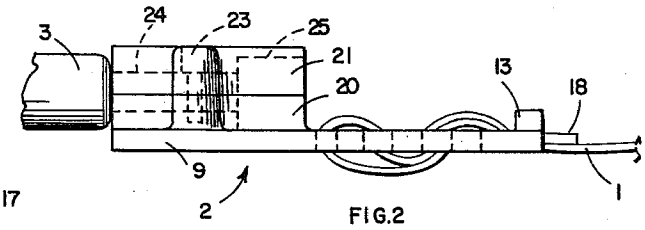


FIG. 2

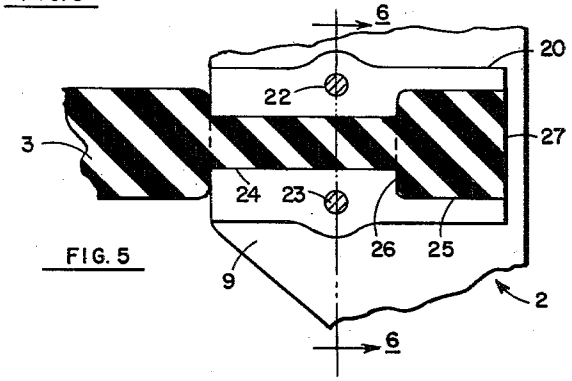


FIG. 5

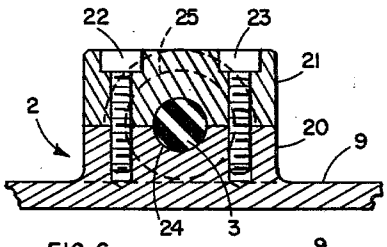


FIG. 6

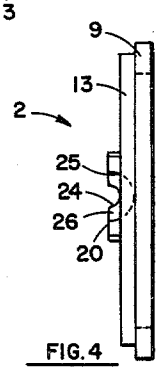


FIG. 4

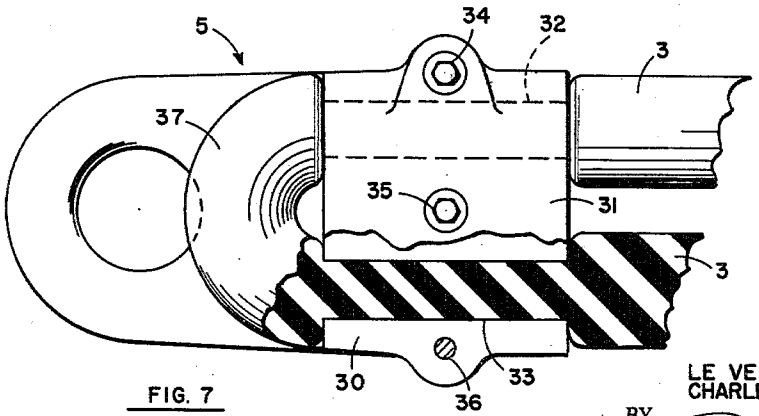


FIG. 7

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PHYSICAL CONDITIONING DEVICE HAVING ELASTIC STRANDS

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2 Claims. (Cl. 272—82)

This invention pertains to a physical conditioning device especially adapted to develop the leg muscles of athletes.

While having general utility as an exercising device, the arrangement of this invention is particularly effective in conditioning the legs of football players. It tends to simulate conditions encountered in the game and permits development of precisely the proper muscles. The device of the invention is simply used, permitting the athlete to drive with his legs in overcoming a resisting force that increases with progressive movement of the athlete.

The device includes a flat belt element secured at its ends to a pair of elastic strands. The opposite ends of the strands may be secured to a stationary object. The device is used by engaging the belt and moving in opposition to the resistance offered by the resilient strands. Special fastening devices firmly hold the ends of the strands and act as buckles to secure the belt to the strands. Each of the fasteners includes an elongated aperture smaller than the diameter of the elastic strand, which is stretched locally and fitted within the opening. This permits the elastic element itself to exert a retaining force as it reacts outwardly against the walls of the aperture, yet this arrangement will not cause damage or result in a weakened point in the resilient element.

It is an object of this invention to provide an effective exercising device providing a resisting force in response to movement.

Another object of this invention is to provide a unit suitable for exercising leg muscles and resulting in greater resisting force the more the unit is moved.

A further object of this invention is to provide a secure, simple, safe and low cost clamping arrangement for securing resilient elements.

These and other objects will become apparent from the following detailed description taken in connection with the accompanying drawing in which:

FIG. 1 is a perspective view of the arrangement of this invention,

FIG. 2 is an enlarged side elevational view of the clamping element interconnecting the resilient strand with the belt,

FIG. 3 is a top plan view of the arrangement of FIG. 2 with the belt removed for clarity,

FIG. 4 is an end elevational view of the arrangement of FIG. 3,

FIG. 5 is an enlarged fragmentary sectional view taken along line 5—5 of FIG. 2 showing how the resilient element is retained within the aperture of the clamping device,

FIG. 6 is a transverse sectional view of the clamping arrangement taken along line 6—6 of FIG. 4,

FIG. 7 is a top plan view, partially broken away, of the clamping device at the opposite end for attachment with a fixed point in use of the device of this invention.

As seen in FIG. 1 of the drawing, the device of this invention includes a relatively wide flat belt or strap 1 secured by clamps 2 to the ends of a pair of strands 3 of elastic material such as rubber. The opposite ends of these filaments connect to a clamp 5 which, through hook 6, is secured to a fixed structural element 7. In use of this device the inner surface of the belt 1 may be contacted at the waist or other portion of the body, permitting the person to drive outwardly against the resisting force of strands 3. The greater the movement of the belt 1 away from the fixed structure 7, the more the resistance encountered from the members 3. This type of resilient resisting force is particularly effective in developing leg muscles as may be necessary for football players or other athletes.

With reference now to FIGS. 2 through 5, the arrangement of the clamps 2 and the connection to the belt 1 may be seen. Each clamp 2, which may be of aluminum, includes a flat plate section 9 provided with suitable slots to permit the end of the belt to be woven through. As best illustrated in FIGS. 3 and 4, the plate of the clamp includes three parallel cross bars 10, 11 and 12 plus a laterally offset cross element 13 which define slots 14, 15, 16 and 17. This permits the belt end to be extended through the openings, as seen in FIG. 2, for attachment to the clamp. When the end portion of the belt has been passed through the various slots, it becomes doubled over. Two thicknesses pass through the slot 17 on one side of the cross element 13 so as to extend on the opposite side of the cross member 12. These thicknesses of the belt then extend through the slot 16 at the opposite side of the plate, passing over the cross bar 11. The belt is doubled over, so that a single strand passes through the aperture 15 on one side of the cross member 10, while its continuation passes through the end slot 14 on the opposite side of the member 10. In accommodating only one thickness of the belt 1, the slot 14 may be narrower than the other apertures. The distal end 18 of the belt extends beyond the clamp element and lies along the principal surface of the belt. The offset relationship of the member 13 allows the belt to pull along the center of the clamp without undue tendency to twist it. This doubled-over arrangement, together with the weaving back and forth through the slots, assures that the belt end is firmly secured. Thus, regardless of the amount of force applied to the belt 1 it will not slip through either of the clamping members 2. Nevertheless, no auxiliary fasteners are necessary, and the belt is quite easily associated with the members 2 which act as buckles for the belt ends.

In order to retain the resilient strand 3, the element 2 includes a base section 20 at the end opposite the slots, to which is attached a cover 21 by means of screws 22 and 23. The base and cover form a housing and are internally contoured so that together they define a pair of cylindrical apertures 24 and 25. Opening 24 is longer and smaller in diameter than aperture 25 so that there is an internal shoulder 26 defined between these two sections.

The end section of the strand 3 fits within the cylindrical openings 24 and 25. In order to accomplish this, it is necessary to stretch the strand to permit it to fit within the opening 24. In a typical example, the strand 3 must be stretched to four times its normal length before it will fit within the opening 24. Hence, where the strand 3 has a diameter of ⅞ inch, the opening 24 may be 7/16 inch in diameter. Aperture 25 normally is the full diameter of the strand 3 and receives the outer end portion 27 of member 3.

With the strand stretched and fitted into the opening in the base portion 20, cover 21 is applied and the screws 22 and 23 threaded into place. Then with the strand 3 released it is firmly retained to the clamping member. The outward force exerted by the strand 3 as it seeks to reach its full dimension serves to securely hold it within the clamp by frictional force. Shoulder 26 between the openings 24 and 25 adds to the resisting force exerted. The shoulder means that in order to pull the strand 3 from the clamping element, it is necessary to reduce the diameter of the end section 27 that is within the end opening portion 25. Furthermore, the shoulder 26 digs into the resilient material of the strand, resulting in fur-

ther resisting force. Tests have indicated that the strand may be elongated until its diameter is approximately 1/32 inch smaller than opening **24** before slippage through the clamp will be encountered. This is more than ample in resisting any force that will be imposed upon the clamp element.

In selecting materials for the strands **3**, normally rubber is utilized, such as a solid rubber rod 7/8 inch in diameter. A unit having a total length of fifteen feet, or seven and one-half feet for each side, provides ample dimension for full use of the device and permits an appropriate amount of elongation as the strands are stretched. The Shore hardness of the rubber will determine the amount of force to be applied to it in stretching the strands a full amount. For the 7/8 inch strands of rubber, the Shore hardness usually will run between 30 and 60.

The strap **1** can be made of neoprene belting four inches wide by fifty-four inches in length. This preferably is a reinforced belting that includes two plies of fourteen-ounce fabric.

The clamping element **5** may be based upon the same general principles as the end clamps **2**, securing the strands by holding them in a stretched and elongated condition within apertures of smaller diameter. As seen in FIG. 7, the base **30** and the cap **31** define two parallel cylindrical apertures **32** and **33**. The strand of rubber is stretched to fit within these openings which are somewhat smaller in diameter than that of the free dimension of the resilient strand. As for the clamps, openings of 7/16 inch diameter may be used for rubber elements of 7/8 inch diameter. The cap is held on by three screws **34**, **35** and **36** after the strand of resilient material has been stretched to fit within the openings **32** and **33**. The strand generally is a single length of material, and hence leaves an unstretched interconnecting portion **37** at the end of the apertures **32** and **33**. As before, the clamp exerts a firm retaining force, requiring that the portion **37** between the two cylindrical openings, as well as the main length of the strand, be stretched to fit within the confines of the cylindrical openings if slipping through the clamp is to take place. Therefore, no matter what uneven force may be imposed on the strands, the clamp will hold firmly and maintain the two strands of equal length. The clamp is simple in construction and use will not damage or weaken the strand of resilient material.

The foregoing detailed description is to be clearly understood as given by way of illustration and example

only, the spirit and scope of this invention being limited solely by the appended claims.

We claim:

1. An exercising device comprising

a substantially flat flexible strap,

a cylindrical elastic filament,

a duality of fasteners for securing the opposite ends of said filament to the opposite ends of said strap,

each fastener including a plurality of slots therethrough,

said strap end being woven through said slots for securing said strap to said fastener,

each of said fasteners including a duality of interconnected cylindrical apertures therethrough,

said apertures defining a shoulder therebetween,

one of said apertures being smaller in diameter than the diameter of said filament,

the other of said apertures being substantially equal in diameter to the diameter of said filament,

said filament being stretched and received in said one aperture with the distal end of said filament being received in said other aperture,

and a fastener intermediate the ends of said filament for securing said filament to an adjacent object,

said last mentioned fastener including a duality of substantially parallel cylindrical apertures therethrough,

said filament being stretched and received in said last mentioned apertures,

and extending between two adjacent ends of said last mentioned apertures.

2. A device as recited in claim **1** in which said filament is rubber having a Shore hardness substantially in the range of from 30 to 60.

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