

[54] TIE STRAPS  
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[58] Field of Search ..... 248/68, 71, 73, 74 PB;  
24/73 PB, 206 A, 16 PB, 30.5 P, 17 AP

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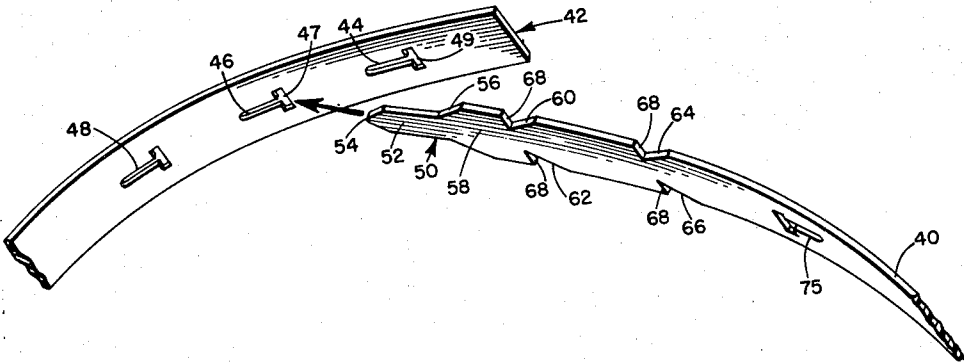
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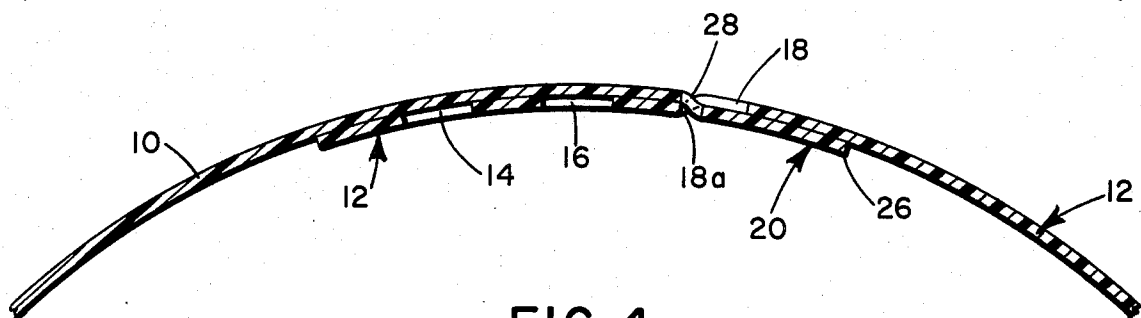
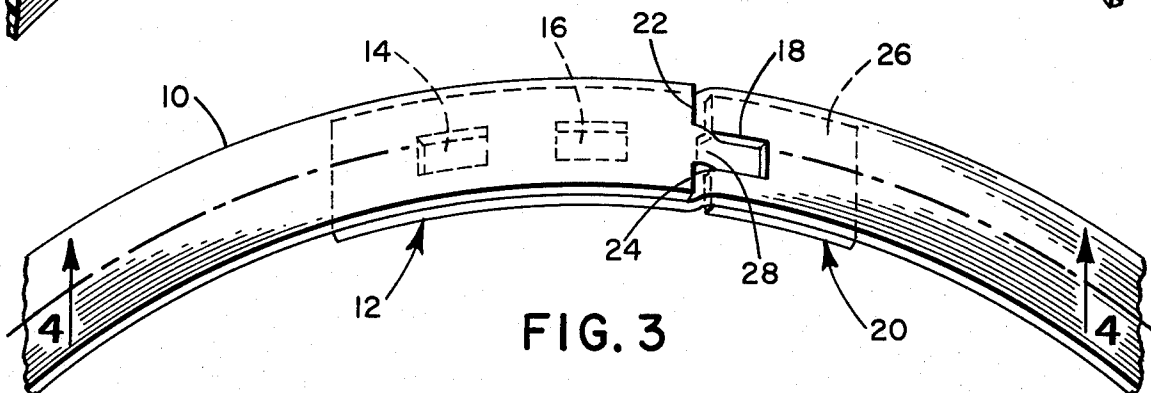
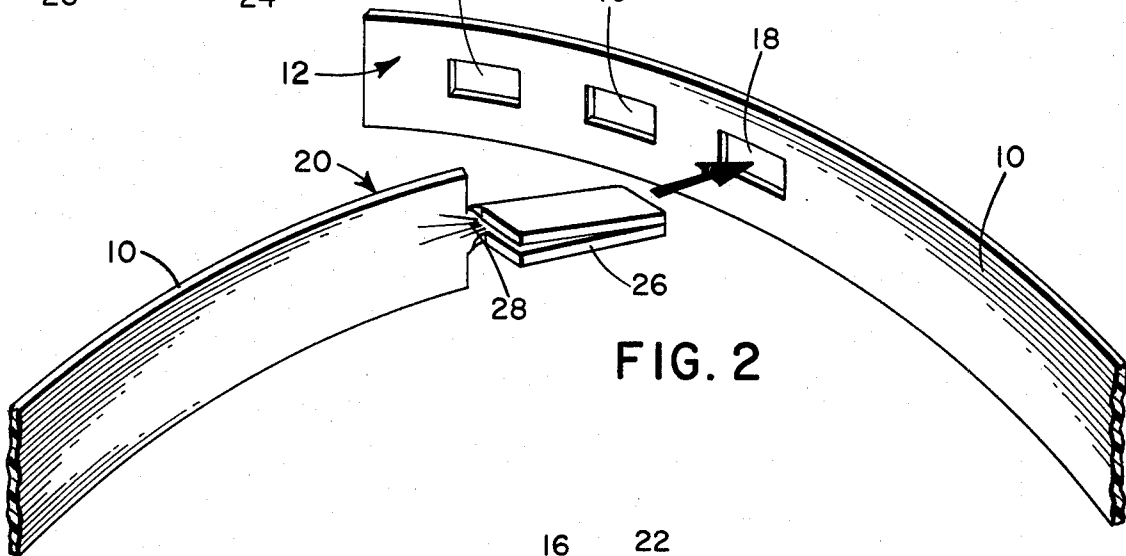
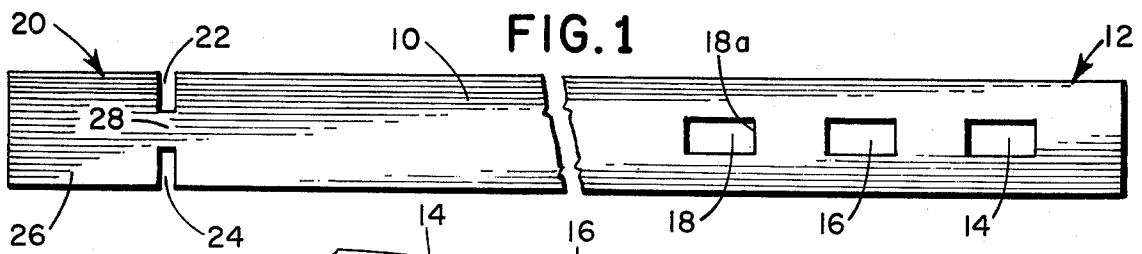
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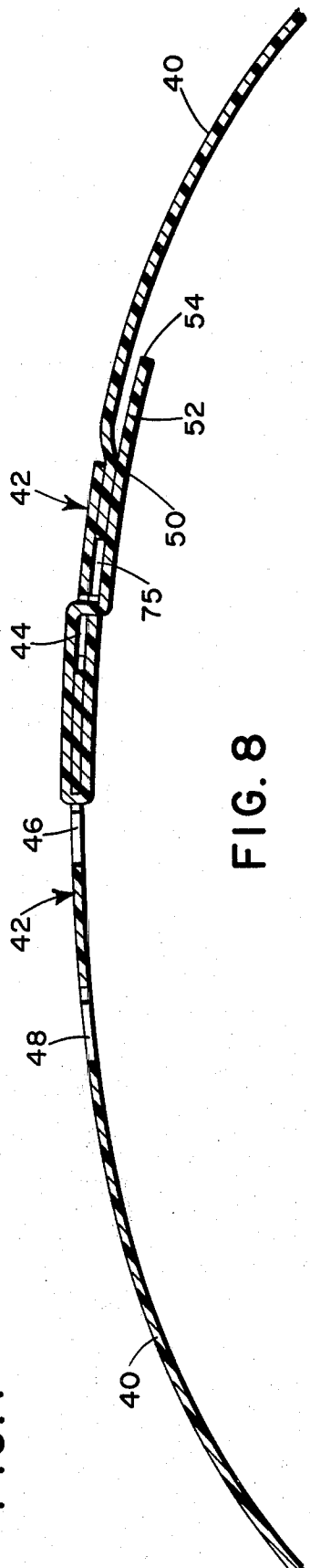
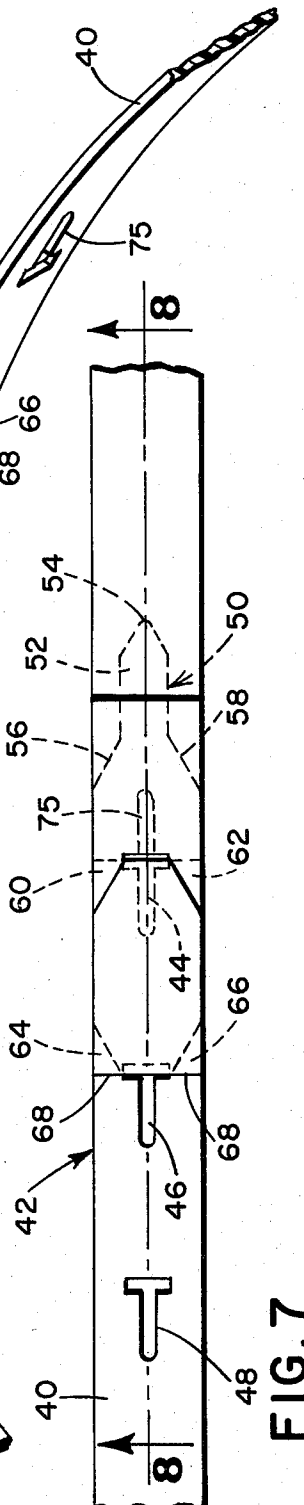
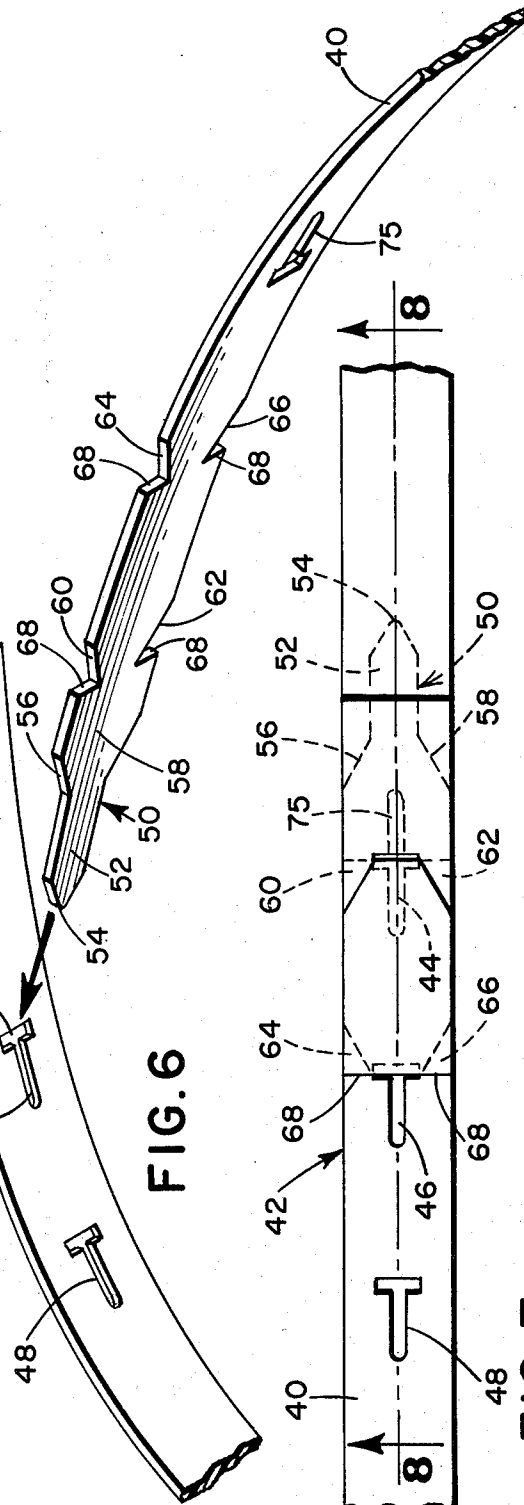
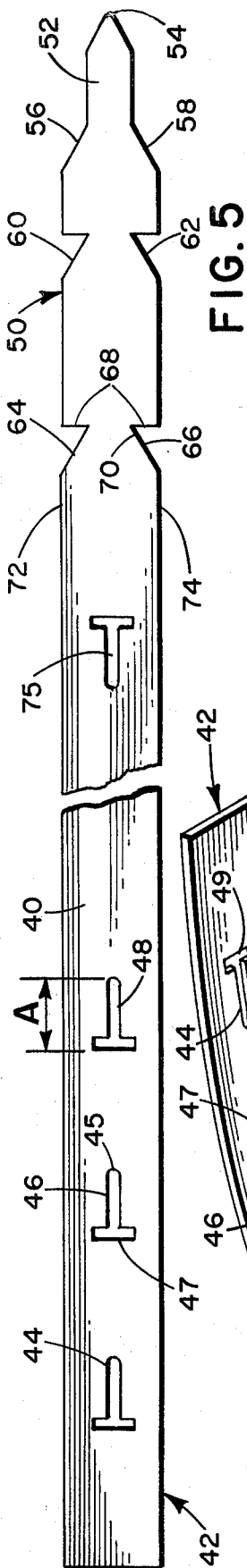
[57]                      ABSTRACT

Adjustable, pliable tie straps are provided comprising a series of longitudinal slot means at one end of the strap and a tongue portion at the opposite end containing notch means, whereby the tongue portion can be inserted in any of the said slots for tying or securing an object.

3 Claims, 8 Drawing Figures







## TIE STRAPS

## BACKGROUND OF THE INVENTION

This invention relates to an adjustable tie strap adapted to be secured together at its ends. Many types of adjustable tie straps made of a pliable material such as plastic, leather, etc. employing metal buckles, clasps and the like, are generally available adapted to secure or tie materials together, such as bundles of electrical wires, etc. Although the prior art adjustable tie straps are generally suitable, some are objectionable in that one end of the strap is loose on adjustment or the use of metal tongue buckles and metallic clasps are required for adjustment. In accordance with this invention improved adjustable tie straps are provided.

## OBJECTS OF THE INVENTION

An object of this invention is to provide an inexpensive adjustable tie strap made from a pliable material such as a plastic material and requiring no metallic buckles, clasps, or the like, and which can be easily secured around an object.

A further object of the invention is to provide an inexpensive adjustable tie strap of any suitable length, which is easily constructed.

## BRIEF SUMMARY OF THE INVENTION

The novel adjustable tie straps of this invention comprise a pliable material, particularly a plastic body which can also be reinforced with glass fibers, or a nylon mesh impregnated with a suitable plastic material such as a polyvinylchloride. The tie strap comprises a series of longitudinal slot means at one end and a tongue at the opposite end adapted to be inserted in said slots. Two embodiments are provided.

## DETAILED DESCRIPTION OF THE INVENTION

The above objects and advantages of the adjustable tie straps will be better understood by reference to the accompanying drawing depicting the two embodiments of the invention wherein:

FIG. 1 is a plan view of one embodiment of the tie strap of the invention with an intermediate portion broken away;

FIG. 2 is a perspective view of a portion of the strap shown in FIG. 1 depicting the two ends of the strap as adapted to be engaged in a fastened relationship;

FIG. 3 is a perspective view of a portion of the strap shown in FIG. 1 in a fastened relationship;

FIG. 4 is a view taken along line 4—4 of FIG. 3;

FIG. 5 is a plan view of a second embodiment of the tie strap of the invention with an intermediate portion broken away;

FIG. 6 is a perspective view of a portion of the strap shown in FIG. 5 depicting the two ends of the strap as adapted to be engaged in a fastened relationship;

FIG. 7 is a perspective view of a portion of the strap shown in FIG. 5 in a fastened relationship; and

FIG. 8 is a view taken along line 8—8 of FIG. 7.

Referring to FIGS. 1-4 of the drawings, the numeral 10 denoted the body of one embodiment of the tie strap constructed of a desired width and longitudinal length and made of a suitable pliable material as will be more fully described hereinafter. One end generally designated by the numeral 12 is provided with a series of longitudinally, aligned slots, preferably rectangular slots, such as 14, 16 and 18. The other end generally

designated by the numeral 20, comprises a pair of oppositely aligned transverse notches 22 and 24 in conjunction with a connecting portion 28 for a tongue portion 26.

The ends 12 and 20 of the novel strap 10 are adapted to be secured together and adjusted to a desired degree by inserting tongue 26 into any one of the slots 14, 16 and 18 as shown in FIG. 2, tongue 26 is folded on itself to permit easy insertion into the slot. As shown in FIGS. 3 and 4, tongue 26 has been inserted in slot 18 thereby securing the strap ends together. Thus, when the two ends of the strap are secured, the connecting portion 28 is within slot 18 and abuts end 18a thereof. Similarly the length of the strap can be adjusted by using slots 14 or 16.

When the ends are engaged as described above, tongue 26 and the end 12 are on the same side of the strap. Thus, the strap, when secured around an object can be turned so that the ends project inwardly and bear against the object, thereby providing a smooth outer surface to the strap. In this manner, the ends are not subject to snagging, wear and tear.

Referring to FIGS. 5-8 of the drawings, the numeral 40 denotes the body of a second embodiment of the tie strap again constructed of a desired width and longitudinal length and made of suitable pliable materials as will be more fully described hereinafter. One end, generally designated by the numeral 42 is provided with a series of longitudinally aligned T-slots, such as 44, 46, and 48, etc. Each T-slot such as 46, comprises, with respect to end 42, a trailing longitudinal part 45 and a leading transverse part 47. The other end, generally designated by the numeral 50, comprises a tongue 52 having a generally pointed end 54 and longitudinal, angular, marginal edges 56 and 58 which increase in width to the same width as the strap edges 72 and 74. Further along the end 50 of the strap beyond the tongue 52, the strap comprises one pair of transversely disposed, opposed, right-angled notches 60 and 62 and a second pair 64 and 66. Each notch, such as 66, comprises, with respect to end 50 a leading transverse part 68 and a trailing angled part 70 which form a right angle inwardly from the outer edges 72 and 74 of the strap. Beyond the pairs of notches is a T-slot 75. The pairs of notches and T-slot 75 are each disposed an equal distance along end 50 from each other. The T-slots are designed to have a length along dimension A (see slot 48) which is about the same dimension as the width of the strap.

The ends 42 and 50 of novel strap 40 are adapted to be secured together and adjusted to a desired degree. As shown in FIG. 6, tongue 52 is turned 90° and is inserted into slot 46 through part 45. The end 54 of the tongue is pushed through or is pulled from the opposite side of the strap whereby angular edges 56 and 58 pass easily through the slot 46. End 50 is further pulled through slot 46 until notches 64 and 66 are within slot 46. The end 50 is then turned 90° and edges 68 of notches 64 and 66 are firmly engaged in part 47 of slot 46. Tongue 52 and notches 60 and 62 are free on the opposite side of the strap. The free end 50 can then be inserted inwardly into T-slot 48 similarly as it was inserted into T-slot 46 thereby providing a more secure tying of the strap ends. It will be apparent that end 50 can be engaged with any desired pair of adjacent T-slots at end 42, thereby providing any desired adjustment of the strap.

A variation of the securing of the strap ends 42 and 50 is shown in FIGS. 7 and 8. End 50 is folded backward toward end 42 and tongue 52 is inserted into T-slot 75 at end 50 similarly as it was inserted in T-slot 46, whereby edges 68 of notches 60 and 62 are firmly engaged in part 47 of T-slot 44. The ends 42 and 50 completely and firmly engaged are shown in FIGS. 7 and 8. In this variation of the securing of strap ends 42 and 50 of strap 40, only the two end T-slots are used. This variation of the securing of strap 40 is usable when a strap is desired to be used in the securing of series of a bundle of elements wherein all have the same circumferential dimension.

The adjustable tie straps are adapted for a variety of uses. Thus, the strap can be used for adjustably securing or tying various objects or elements such as a watch on a wrist, a bundle of elements, and the like. The strap is particularly suitable for securing protective gloves or shoes on a hand or foot. Thus in U.S. Pat. No. 3,769,722, straps are required for adjustably securing a protective shoe on the foot of the wearer. Since these shoes are used in sports such as karate, the straps are particularly adaptable for use therein, because no loose ends or metallic buckles are present which could cause injury to a combatant during use of the shoe in the sport.

Generally pliable plastic materials or leather are suitable for use in the tie straps. However, it was found that a reinforced plastic material was more suitable for the strap. Thus, a plastic material reinforced with glass fibers and the like is very suitable for use in making the strap. Particularly suitable is a nylon mesh impregnated with polyvinylchloride. The straps can also be made of a material as above having a desired degree of stretchability to aid in securing the strap around objects.

The straps can be made of any desired length and width. The number of slots such as 14 or T-slots such as 46 can be varied as desired. The size of the slots are made to be in conformance with the width of the tongue 26 or 52.

From the foregoing description, one skilled in the art can easily ascertain the essential characteristics of this invention, and without departing from the spirit and scope thereof, can make various changes and modifications of the invention to adapt it to various usages and conditions.

What is claimed is:

1. An adjustable tie strap comprising a strip of pliable material having a series of T-slots at one end thereof, the other end provided with a tongue portion adapted to be inserted into one of said T-slots, said tongue end portion including a pair of right angled notches adapted to engage said T-slots, an additional T-slot adjacent said notches, said tongue portion having a generally pointed free end and longitudinal, angular, marginal edges which increase in width to the same width as the strap, said notches and T-slots being suitably spaced along the strap so that the free end of the strap may be passed through a T-shaped slot other than the end slot to lock a pair of notches other than the end most notches therein and then passed through the end most T-shaped slot to lock the end most pair of notches therein and through the said additional T-shaped slot and bent so as to position the said pointed free end in abutting contact with the under surface of the tie strap.

2. The strap of claim 1 wherein said pliable material is a reinforced plastic material.

3. The strap of claim 1 wherein said pliable material is nylon mesh impregnated with polyvinylchloride.

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