This invention relates to the elastic elements of suspenders and shoulder straps for neither garments generally, and particularly for suspenders back overalls.

One of the objects of the invention is the provision of an elastic end assemblage in which the use of metal is minimized and which may be attached to the inelastic portions of suspenders or shoulder straps in a simple and inexpensive manner.

Another object of the invention is the provision of means for prolonging the life of the elastic element by protecting it from moisture absorbed through the contact of the suspenders with the sweaty shirt of the wearer, and which moisture ordinarily quickly rots the rubber and reduces the elasticity of the webbing.

More specifically, those objects which relate to the preservation of the rubber are the employment of cord rubber elastic which makes line contact with the underlying garment and therefore has the minimum absorptive capacity, and the location of that part of the attaching portion of the cord elastic in a ventilating chamber in the webbing, and substantially out of contact with said webbing.

Other objects of the invention will appear as the following description of preferred and practical embodiments thereof proceeds.

In the accompanying drawing, which forms a part of the following specification and throughout the several figures of which the same characters of reference have been employed to designate identical parts:

Figure 1 is a front elevation partly in section of an elastic end assemblage embodying the principles of the present invention;

Figure 2 is a side section;

Figure 3 is a perspective view of a suspender end showing the device of the present invention attached to the end of a suspender;

Figure 4 is a front elevation partly in section showing a slightly modified form of the invention;

Figure 5 is a front elevation partly in section showing still another modification;

Figure 6 is a side sectional view of the form of the invention shown in Figure 5; and

Figure 7 is a perspective view of a portion of the cord elastic illustrating its construction.

Referring now in detail to the several figures, and to that form of the invention shown in Figures 1, 2 and 3, the numeral 1 represents a short length of webbing preferably inelastic folded or doubled upon itself to form a stirrup. The bottom of the stirrup 1 is provided with spaced openings 2 and 3, faced or lined by riveted eyelets 4 and 5. A spacer 6 having a fair degree of rigidity, but preferably not absolutely rigid is riveted under the eyelets 4 and 5 and bridges the space between them on the inside of the stirrup 1. The free ends of the length of webbing which form the stirrup are adapted to be inserted in the tubular end 7 of an overall shoulder strap for example, and to be united thereto by suitable stitching 8.

The reference numeral 9 designates the elastic button loop which comprises a length of cord elastic 10 inserted into one of the eyelets 4 or 5 and out of the other and having its free ends 11 and 12 and the opposite side portion 13 brought together within a metallic clamp 14 and secured against slippage by the constriction of said clamp. The lower part of the elastic cord is expanded to form a button engaging portion 15.

The use of the device is of course obvious. The portion 15 engages a button on the inelastic part of the trousers or overall and a variable tension is thus created in the button loop 9. On account of the fact that most of the elastic button loop is outside of the stirrup 1, the capacity of the button loop to stretch is not impaired by pull upon the same in diagonal directions represented by the broken lines a or b. This is quite an advantage over known devices in which the button loop is formed of inelastic material and depends for its elasticity upon an elastic member situated altogether within the stirrup. In such constructions, while the capacity to stretch is not impeded when the pull is in a downward direction, any change in direction makes available only a component of the elasticity provided by the source which is concealed within the stirrup.

It will be understood that cord elastic has been chosen for the material of the button loop in view of the fact that the round shape of its cross section causes it to engage the underlying garment solely with a line contact. It is preferred in the present invention to employ a cord elastic in which the core is made up of a plurality of rubber strands 20 as shown in Figure 7, the core being covered while under tension.

Consequently, if the underlying garment is moist with perspiration, only a minimum amount of this moisture can be absorbed by the cord elastic. It is well known that the deterioration of the elasticity of elastic webbing is due to the effect of moisture upon the rubber. This deterioration is brought about in two ways. In the first place, moisture lubricates rubber and when it mixes with the rubber, it causes the same to become soft, weak, and therefore susceptible to rapid destruction and ultimate failure.
an ordinary piece of rubber elastic webbing becomes moist, the woven fabric loses its grip upon the rubber strands which tend to contract concentrating the entire force of their contraction at the points at which the webbing is stitched to the adjacent fabric. The rubber soon breaks at this point if tensioned while wet. Moisture and particularly moisture of an acid nature such as perspiration quickly rots the rubber, destroying its elasticity and causing breaking. By minimizing the absorption of perspiration through the use of round cord rubber the life of the elastic is thus greatly prolonged.

It will of course be conceded that a chain is no stronger than its weakest link, and if provisions were not made for keeping dry that part of the cord elastic which lies within the stirrup, the quick deterioration of the rubber at this point would cause the button loop to break. It will be observed however, particularly from Figure 2, that the provision of the eyelets 4 and 5 and the spacer 6, at the bottom of the stirrup gives a substantial width dimension to the stirrup and holds the sides of the stirrup somewhat apart. Furthermore, the ends of the stirrup are open as indicated at 16 in Figure 2. A ventilated chamber is thus provided and the portion of the cord elastic which traverses this chamber is held out of contact with the webbing which forms the stirrup. Therefore, regardless of how soaked the webbing is, it may become with perspiration the elastic cord within the stirrup remains dry.

Mention has been made of the fact that the spacers 6 are fairly stiff, but preferably not absolutely rigid. This protects the cord elastic against rupture should it be subjected to a sharp pull in a diagonal direction while at the same time, assuring that in the normal operation of the suspender the two sides of the cord elastic shall be kept apart. Under a sudden diagonal pull the spacer yields slightly dampening the impact of the strain taken by the cord elastic at the points adjacent the eyelets where it abruptly changes its direction.

Figure 4 shows a slightly modified form of the invention in which two button loops share the same eyelets. These of course are adapted to be secured to adjacent buttons preferably at the back of the overalls and the strain in the lateral flexing of the body is transferred from one button loop to the other.

Insofar as the principle of the invention is concerned, it is the same in this form as in that previously described.

In Figure 8, a further modification of the invention is illustrated which is perhaps somewhat simpler to construct and assemble than the forms which have already been described. An arcuate metal spacer 17 is provided of channeled cross section, and preferably substantially as wide as the stirrup in which it is freely inserted. The upper portion of the cord elastic button loop 9 is seated in the channel of said spacer, the latter being provided with lugs 18 which are pressed up substantially against the seated portion of the cord elastic button loop, holding it in the spacer, but leaving it free to stretch and contract. The length of webbing forming the stirrup is simply passed through the bight 15 formed by the upper part of the button loop and the two ends of said length folded one against the other, then inserted into the tubular webbing 1 and then stitched in place. The arcuate nature of the spacer 17 assures that it will always remain properly centered in the bottom of the stirrup.

It will be observed that the feature of maintaining the concealed part of the cord elastic button loop dry is carried out in this form of the invention as well as in the previously described forms. The spacer 17 keeps the two sides of the stirrup apart, and furthermore, the spacer substantially surrounds the cord elastic by a metal sheath which prevents it contacting with the fabric of the stirrup.

While I have in the above description disclosed what I believe to be preferred and practical forms of the invention, it is to be understood that the illustrations are merely by way of example and that the details of construction as shown and described may be varied according to the desires or requirements of manufacture without transcending the scope of the invention as defined in the appended claims.

What I claim is:

1. Suspender end assembly comprising a piece of fabric folded to form a stirrup, spaced perforations through the bottom of said stirrup, eyelets lining said perforations, and a button loop including a cord elastic portion, said portion passing through said eyelets in interlinked relation to said stirrup, and means for keeping said interlinked portion out of direct contact with the fabric of said stirrup.

2. Suspender end assembly as claimed in claim 1, the means for keeping said interlinked portion out of direct contact with said stirrup including in part a spacer bridging the space between said eyelets.

3. Suspender end assembly as claimed in claim 1, the means for keeping said interlinked portion out of direct contact with the fabric of said stirrup comprising a spreader of such degree of rigidity as to yield slightly under a pull of impactive force.

4. Suspender end assembly comprising a piece of fabric folded to form a stirrup, spaced perforations through the bottom of said stirrup, and a button loop including a cord elastic portion, said elastic portion passing through said perforations in interlinked relation to said stirrup.

5. Suspender end assembly comprising a piece of fabric folded to form a stirrup, spaced perforations through the bottom of said stirrup, eyelets lining said perforations, and a button loop including a cord elastic portion, said portion passing through said eyelets in interlinked relation to said stirrup.

LYNDON W. JOYCE.