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LOOM BUMPER STRAP  
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*Fig. 1.*

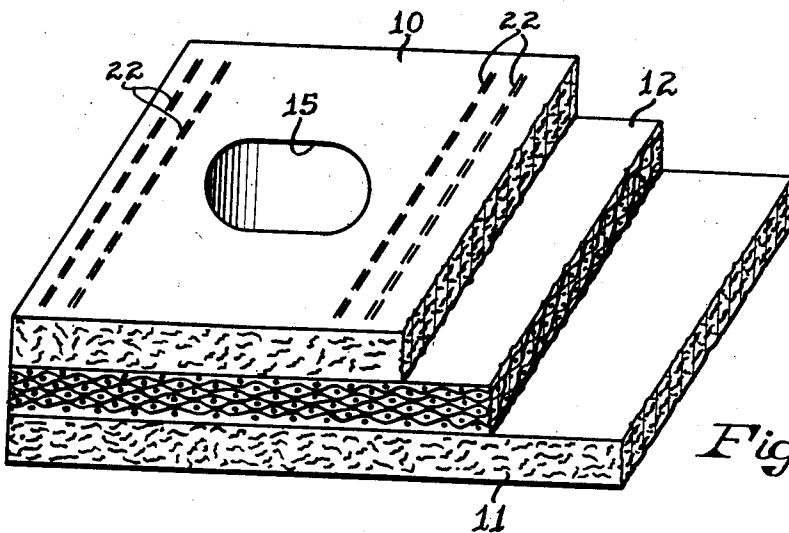
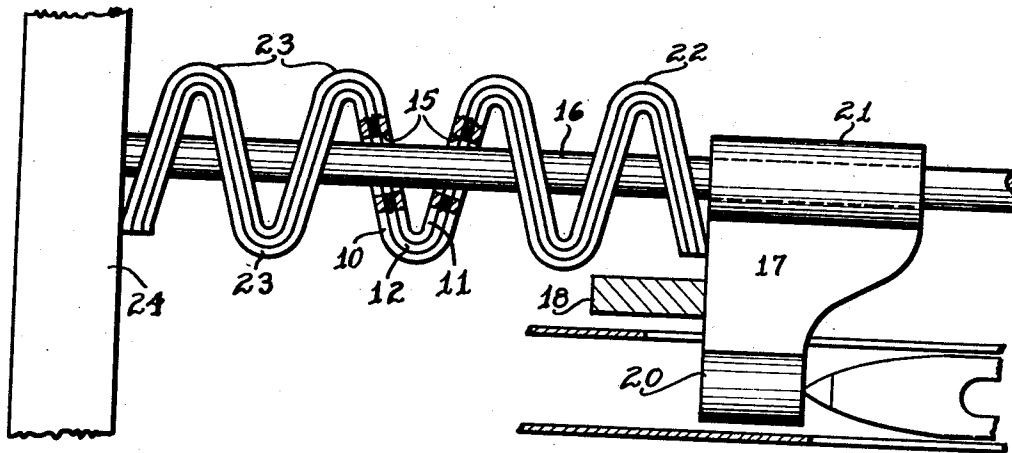


*Fig. 2.*

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# UNITED STATES PATENT OFFICE

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## LOOM BUMPER STRAP

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1 Claim. (Cl. 139-166)

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This invention relates to loom bumper straps, and more particularly to a buffer arranged to receive the impact blow of the picker when struck by the returning shuttle.

In one type of loom, the picker is slidably mounted on a rod arranged parallel with the shuttle movement. The buffer for cushioning the picker is a long strap of stiff leather having a series of spaced elongated holes so arranged that the strap may be threaded on the picker rod as a corrugation. When the picker is struck by the returning shuttle and it in turn engages the folded bumper strap, the latter snubs or cushions the picker movement and brings it gradually to rest. In addition to this cushioning characteristic, the bumper should possess sufficient resiliency so that it will expand slowly to its original wavy shape after it has been compressed by the impact blow, but the resiliency should not be high enough to throw the picker back. However, the impact derived from the rapidly moving and comparatively heavy shuttle pounds the leather and softens and weakens it, so that it ultimately loses its ability to restore its expanded condition to a required extent. As a partial remedy, the loom operator threads only part of the loops on the rod at first, and when the leather has softened materially, he adds more loops and so renews the corrugation restoring ability. However, this leather strap is not economically efficient, because of its being softened and losing its resiliency under the shuttle impacts; and the loom has to be stopped too frequently for replacing the bumper, with a consequent loss of weaving time.

It is the primary object of my invention to overcome such problems and provide a bumper strap of this general type which will maintain both the required snubbing action and a satisfactory resiliency under the repeated impacts and give a long life of useful service. Other objects will be apparent in the following disclosure.

In accordance with my invention I make a loom bumper strap of at least one layer of leather secured to a strip of fabric bonded by an elastomeric polymer, which are so arranged that the leather receives and cushions and absorbs the impact, while the strip gives a required resiliency to the corrugated strap so that it will slide quickly to its initial expanded condition after each blow and thus maintain the strap ready for repeated service.

Referring to the drawings which illustrate a preferable embodiment of this invention:

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Fig. 1 is a fragmentary side elevation, partly in section, of the bumper strap mounted on the picker rod;

Fig. 2 is a fragmentary isometric view of one end of the strap in exaggerated size.

The preferred construction of bumper strap comprises two outside layers 10 and 11 of leather, arranged with their flesh sides facing outwardly, and between which is secured an elastic layer 12 having sufficient resiliency for restoring the required open corrugation of the strap as soon as the impact blow has been absorbed.

The elastic layer 12 is made of multiple layers and preferably two or three layers of fabric of suitable material, such as cotton, rayon or nylon, cemented together by a bond of a natural or synthetic rubber or other suitable elastomer. The fabric is preferably canvas or duck made of comparatively coarse cotton threads, such as a No. 4 duck, which has a considerable stiffness and strength because of its compact weave and large threads. The several layers of fabric are arranged in laminated form with the rubber impregnating the open spaces of the textile and securing the layers together as a unitary body.

The assembled layers are provided with elongated openings 15 therethrough, which have such shapes that the strap may be readily threaded onto the round rod 16 of the loom frame on which the picker 17 is caused to slide when actuated by the picker stick 18. The picker 17 may be of standard construction, and it may comprise a depending portion 20 of leather arranged to throw and to receive the shuttle and a cylindrical portion 21 having an opening therethrough so arranged that the picker may slide on the rod 16 when struck by the picker stick.

The several sheets of fabric are cemented together by an elastic cement which will prevent friction between the fabric plies and between the fabric and the leather layers. The cloth gives strength and a dimensional stability to the strap, in that it holds the leather in a proper cushioning condition and position. The cement holds the fabric as a resilient body. For the cement, I prefer an elastic rubber cement of standard type made of either natural or a synthetic rubber, such as neoprene, in a suitable solvent, such as gasoline or benzene. The fabric strips may also be secured together by rolling them with interposed thin layers of soft rubber on a calendering machine, where the heat and pressure force the rubber into the fabric. The bonded fabric layers provide the slight degree of resiliency or stiffness needed to expand the strap

3 corrugations after the picker blow. The rubber cement layer is too thin to cause that expansion. Also, rubber alone would be too resilient, in that it would cause the picker to rebound. By cementing two or more layers of fabric together 5 almost in contact, I provide the needed stiffness that distends the corrugation. The fabric bonding cement may also serve to secure the exterior faces of the inner layer to the leather pieces. When thus assembled, the strap as a unit has 10 the needed stiffness, and the leather is not allowed to bend or soften as much as when used alone, because it is supported by the bonded fabric. On the other hand, the leather protects 15 the fabric and receives all of the scuffing action.

The leather strips may be secured to the rubberized fabric by various cements such as a standard cement used in the leather industry. I prefer a commercial cement made of a natural 20 or a synthetic rubber in a suitable solvent, or a flexible animal glue, or nitrocellulose in an acetone solvent or vinylacetate or chloride dissolved in acetone. Various other elastomeric polymers may be employed as the cement; since their primary characteristic is to bond the fabric layers 25 together as a body that will bend with enough stiffness to return to its original shape when bent. If desired, the several strips may also be secured together near their ends by the thread stitches 22 which strengthens the strap at this 30 point. The strap dimensions may be widely varied, but it is preferred that each leather strip and the fabric layer be about  $\frac{1}{8}$  inch thick. The strap may be 18 or 20 inches long and 1.5 inches wide. It may be bent to provide 3 or 4 waves or 35 loops, as shown.

The bumper strap, as shown in Fig. 1, tends to assume the maximum expanded condition permitted by the ends of the elongated slots engaging the rod 16. When struck by the picker, the 40 strap folds are moved towards each other or compressed to a limiting condition where the layers of the folds are in actual contact. The blow is absorbed gradually by this bending of the strap folds 23 or by the compression of the corrugated body. Then the stiffness or resiliency of the inner fabric layer serves to open up the folds of the strap and bring it back to its initial 45 expanded shape. The outer layers of leather receive the direct blow of the picker and the indirect pressure of the rear frame member 24 of the loom, and because of the elasticity of the leather absorb and transmit the blow without being injured or materially affected, except as the leather becomes softer under the impacts. The inner rubberized laminated fabric layer is not 50 struck by the moving picker and so is not injured. Hence it retains its natural resiliency for a very long life of service and will return the strap to its initial expanded condition at the desired rate.

The fabric is immobilized to a considerable extent by the rubber cement that impregnates

and bonds the layers together, so that the rubberized fabric is stiff and not highly resilient. Hence it acts somewhat like a piece of new leather. This inner layer retains its characteristics for a long time, although the outer leather layers may become softened in time by the repeated blows. Hence, the strap continues to give the required cushioning service long after the leather layers have been materially softened or deadened and have but little of their initial resiliency left. The leather cooperates with the inner layer to protect it from the impact blow while this inner layer supplies the needed return of corrugation shape. It will be observed that the rubberized fabric is not intended to strengthen the leather body since tensile strength is not material, but that it serves as a supplemental cushioning and resilient medium when the strap is new and it provides the needed corrugation expansion after the leather has been softened by the blows.

I claim:

In a loom having a shuttle, a picker arranged to throw and receive the impact of the shuttle, a picker rod on which the picker slides and a frame member support for the rod, a loom picker bumper strap comprising an elongated, narrow laminated body having outside parallel layers of leather, and an inner, unitary strip of multiple layers of closely spaced rubberized fabric in which the fabric layers are bonded together by 30 rubber as a stiffly resilient spring strip, said leather layers and the inner strip having a series of spaced elongated holes threaded on the picker rod between the picker and the support and forming S-shaped compressible corrugation loops, the leather absorbing and protecting the strip from the picker blows and the strip loops resiliently resisting bending and serving to cushion the 40 picker impact gradually and to urge the strap towards a straight condition and expand the loops after the impact irrespective of the condition of the leather layers.

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