

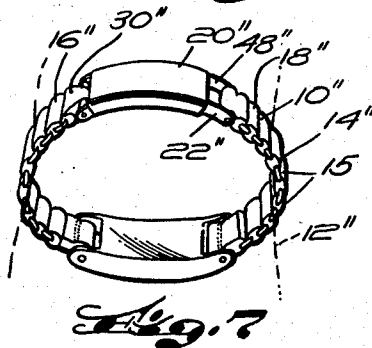
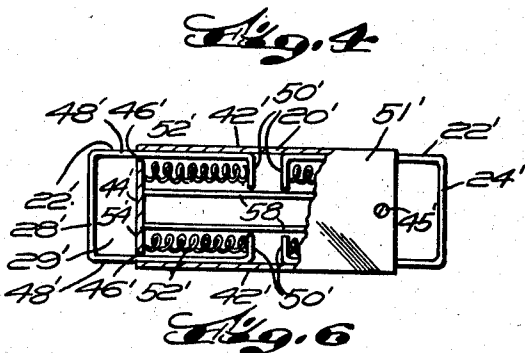
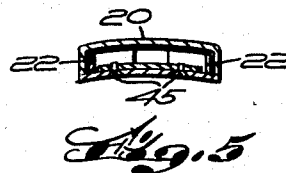
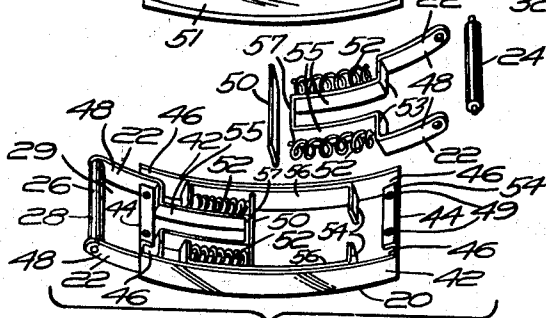
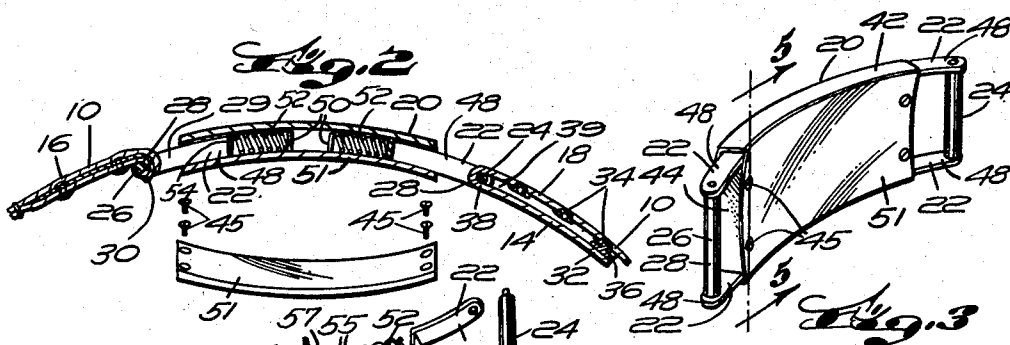
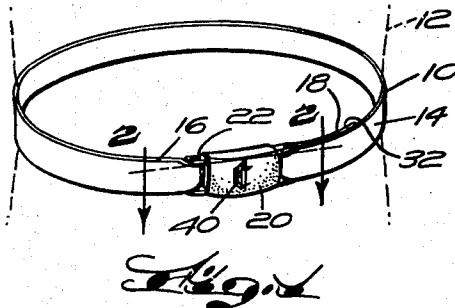
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E. BLISS ET AL

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ADJUSTABLE FLEXIBLE STRAP

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ADJUSTABLE FLEXIBLE STRAP

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3 Claims. (Cl. 2-322)

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Our invention relates to improvements in adjustable straps, of the well-known type having flexible non-extensible strap portions of a length to encircle a limb or body torso or join two article portions together, having a fixed end and an adjustable end. For many years the two strap ends have been attached together by means of a buckle fixedly mounted on one strap end with the upper strap end passing through said buckle usually overlapping the fixed strap and being adjustably secured by said buckle thereto, a standard type of such structure being the usually so-called harness buckle having a tongue pivotally mounted thereon fitting into a selected hole in the adjustable strap end or which may have means to clamp the adjustable strap end thereto at various relative positions of the adjustable end. While these types have been flexible they have not been extensible in any great degree and have caused such a pressure on the body of the wearer as to impair his freedom of movement and often caused the wearer bodily harm.

An object of our invention, therefore, is to provide a totally new type of belt entirely dispensing with the standard type of buckle and substituting for it a strain compensating member having a resiliently extensible portion projecting from one end thereof having means on the end thereof secured to one strap end and means on the opposite end of said connecting member for securing the other strap end thereto, one of said securing means being detachable and one of said strap ends being adjustable in itself entirely independently of the connecting member.

A further object of our invention, therefore, is to overcome this great difficulty with former flexible straps or belts of this description by providing a strap which is expansible for the free movement of the wearer thereof without harm to the wearer as is desirable when the wearer is moving rapidly as when exercising and is particularly desirable as to not exert pressure against the stomach or body of the wearer, after a full meal.

A further object of this construction is that it permits the use, we believe, for the first time, of a flexible metal belt in wearing apparel as it permits the metal belt or strap to be sufficiently expansible for use. While most flexible straps have been made of leather or fabric which have a slight longitudinal expansibility so that they are not quite so hard on the wearer, it is a well-known characteristic of a metal belt that it has no give or expansibility at all and hence has been entirely unsuitable for wearing purposes, except possibly for ornamental purposes.

Our invention, therefore, makes possible the use of a metal belt constructed of flexible chain, mesh, or otherwise, with its novel ornamental colors, effects and possibility of designs.

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A further object of our invention relates to the structure of the strain compensating connecting member which may be adjusted to the desired expansibility in use and which by its own inherent construction may be readily ornamented with a wide variety of different designs.

A further feature of our invention resides in the fact that most objectionable features of buckle straps are eliminated. The relative movement of one strap end over the other is entirely eliminated. The adjustable strap end may be initially set to fit an individual person and the expansibility of the connecting member takes care of any normal variations in weight of the wearer, or should an excess of variation take place the adjustable strap end may be readily adjusted.

A further feature of our invention relates to the fact that we adjust a strap end relative to its own length rather than relative to its relative movement over the other strap end, thus varying the length of an individual strap end, in a metal strap by removing one or more links and in a fabric strap in the specific manner indicated herein.

A further object of our invention is that as there is no movement of one strap end relative to the other strap end or to the compensating member, that the wearing effect of the strap ends bearing against each other or on one strap end in shifting the flexible tongue from one hole to another or to a plurality of different clamping positions is entirely eliminated.

A further object of our invention in certain aspects thereof is to provide a belt which is more quickly detachable and attachable than standard types, as it is merely necessary to fasten a hook on one end of a strap through a hole in the connecting member.

These and such other objects of our invention as may hereinafter appear will be best understood from a description of the accompanying drawings which illustrate embodiments thereof.

In the drawings,

Fig. 1 is a perspective view of our improved strap in use around the torso of a wearer, shown in dotted lines.

Fig. 2 is a longitudinal sectional view taken along the line 2-2 of Fig. 1.

Fig. 3 is a reverse plan view of the improved type of strain compensating connecting member we preferably employ.

Fig. 4 is a disassembled perspective view of the connecting member of our device with one ball portion thereof with its associated parts laid in position in the box-like connecting member.

Fig. 5 is a transverse sectional view taken along the line 5-5 of Fig. 3.

Fig. 6 is a reverse plan view partially broken away of a modified form of our improved connecting member.

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Fig. 7 is a perspective view of our invention employed on a flexible metal strap.

In the drawings, wherein like characters of reference generally indicate like parts throughout, 10 generally indicates an adjustable strap constructed in accordance with our invention. As stated, said adjustable strap is automatically extensible on movements of the object strapped, such as movements of the torso 12 of the wearer shown in dotted lines in Fig. 1 when moving rapidly or exercising, or the wrist 12' of the wearer wearing the bracelet strap shown in Fig. 7.

As stated, our invention comprises a non-extensible flexible strap portion 14 or 14'' of a length to encircle a limb, such as the wrist 12'' shown in Fig. 7 or body torso 12 as shown in Fig. 1 or to join two article portions together, such as the edges of shoes, overshoes or corsets, having a fixed end 16 or 16'' and an adjustable end 18 or 18'' and a strain compensating member 20 or 20'' having a resiliently extensible portion 22 or 22'' projecting from at least one end thereof, having means such as the bail base 24 or 24'' on its end secured to one of said strap ends, namely the adjustable strap end 18 as shown in Fig. 2 and means 26 which may comprise a rod or bail base 28 on the opposite end of said connecting member 20 and the hook 30 or 30'' on the tip of the fixed strap end 16 for securing the other strap end thereto, with one of said securing means being detachable, such as the hook 30 on the strap end 16. Our invention is adapted for use with any type of a flexible strap, such as a leather strap, woven strap, knitted or other textile or other strap, and even may be used as shown in Fig. 7 with the flexible metal strap 14'' shown therein, which comprises a plurality of links 15 suitably joined together so that they may flex relatively to each other. The fixed end 16 may be attached to the compensating member in any suitable manner and the adjustable end may be made adjustable in any suitable manner. Where a flexible metal strap is employed, as in the embodiment shown in Fig. 7, the end of the adjustable end 14'' may be varied by adding or removing individual links 15. In the embodiment shown in Figs. 1 and 2, however, the strap has a tip 32 thereof looped underneath it and is adjustably securable at a plurality of points 34 thereto, in the preferred embodiment shown by having a plurality of separable fastener elements 34 mounted at spaced distances on the lower surface of the strap end 18 adjacent the end thereof and with said tip 32 looped underneath it and having a cooperating separable fastener element 36 on the upper surface thereof selectively attachable within a selected separable fastener element 34 on said end 18 to vary the length of the looped end 38 thereof. As stated, we provide a flexible strap portion having a fixed end and an adjustable end with the adjustment for the overall length of the belt or strap being in the adjustable end 18 of the strap 10 itself.

As stated, our invention includes the provision of a resiliently extensible strain compensating connecting member 20 within the belt or strap, having a resiliently extensible portion 22 projecting from one end of said member 20. We may construct our connecting member with one extensible portion only, but we have shown in the drawings in both the embodiment shown in Figs. 1 to 5 and the embodiment shown in Fig. 6, as including two extensible portions 22, duplicates of the other. If one of these is omitted, it is obvious that means must be provided on the opposite end of the com-

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pensating member 20 to secure the fixed strap end 16 thereto, said means being preferably detachable and for this purpose the rod 28 may be rigidly mounted at a spaced distance from the end of the connecting member 20 to provide the hole 29 for insertion of the hook 30 of the fixed strap end 16 therein for attachment and release of the fixed end 16 to the connecting member 20. In both embodiments shown, our strain compensating connecting member 20 shown in Figs. 1 to 5 and the other embodiment 20' shown in Fig. 6, both comprise a preferably rectangular box-like member 20 and 20' comprising an inverted box 20 which may have its front surface suitably ornamented, if desired, as shown at 40 in Fig. 1, having the inturned rearwardly projecting side walls 42 or 42' and the end walls 44 or 44' having hole means 46 or 46'' therein in both embodiments shown, spaced hole means 46 or 46'' adjacent each side wall thereof, where a plurality of springs are to be employed, and, if desired, with suitable screw holes 49 adapted to receive screws 45 or 45' for clamping the cover or back portion 51 or 51' thereto after the device is assembled. Thus, the box connecting means is provided with spaced hole means 46 in each end thereof and a slidable member 22 having means exterior of said box member comprising a rod 24 or 28 for attachment of each strap end 16 or 18 thereto, in the embodiment shown one rod 24 being adapted to extend through the transverse loop 39 on the adjustable strap end 18 and the other rod 28 being adapted to receive the hook 30 for detachable securement of the fixed strap end 16 thereto. In the embodiment shown, we preferably provide the bail shaped members 22 or 22' as said slidable members, having a respective rod 24 or 28 forming a bail base and the spaced legs 48 or 48' projecting inwardly within said box extending through the holes 46 for this purpose, each leg having a portion 50 or 50' extending transversely of said box. We also provide spring means 52 or 52' interposed between said transversely extending portions 50 or 50' and the fixed box portions 54 or 54', said spring means being yieldable to permit outward movement of said extensible portion 22 or 22' when an outward pull is exerted thereon and resilient to return said slidable portion 22 or 22' to its original position when said pull is ended.

It is obvious that in place of the space or hole 29 formed between the rod 28 and box 20 for receiving the end of the hook 30 on the fixed strap end 16 any suitable means may be provided for detachably securing a strap end to said connecting member, that the adjustable strap end 18 may be adjustable in any manner and may be secured to the slidable member 22 in any other suitable manner than by having a rod or bail base 24 thereof extend through the space 39 provided by the looped end. In the embodiment shown in Figs. 1 to 5, the legs 48 of the bail member project inwardly for a substantial distance parallel to each other, are then bent at right angles centrally and then at right angles inwardly to provide the shoulders 53. The closely spaced inner portions 55 of said legs 48 are joined together by the integral cross piece 57 which is soldered to the plate 50 of substantially the width of the box to form the bases 50 at each end thereof against which the compressible ends of the spring means 52 rest. The opposite ends of the spring means about the inturned transverse box portions 54 which are provided in the embodiment shown in Figs. 1-5 by the legs 54 of the U-shaped plates 56, having their bases soldered to the inner surfaces of the

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side walls 42, so that their legs 54 project transversely across a portion of said box to form shoulders 54 on said box against which the opposite ends of the springs 52 may rest. In the embodiment shown in Fig. 6, the bail legs 48 project through the holes 46' and have their ends intumed transversely as at 50' to provide the transverse portions of said movable portions 22' against which the ends of the springs abut, the abutting portions 54' on the box 20' being portions of the end walls 44' thereof adjacent the holes 46' and the springs 52' may be suitably enclosed at the side of the box by the spaced plates 58 extending longitudinally of said box. Suitable screw holes 49 are provided in the box 20 at any desired portion thereof, in the embodiment shown being provided in the end walls thereof to receive the screws 45 for attaching the cover or back wall 51 of the box thereto in either embodiment.

It is apparent, however, that our improved connecting member may be constructed of any desired shape provided it has one or two slidable members 22 with a portion 24 or 28 exterior of said box 20 for attachment of a strap end thereto and a portion to abut an end of the spring means 52 with its other end abutting the fixed portion 54 of said box.

The strap is first adjusted to the desired length by varying the position of the separable fastener element 36 in one of the spaced cooperating separable fastener elements 34, the belt is attached around the object to be covered and the fixed free strap end 16 is detachably secured to the opposite end of the connecting member 20 in the embodiment shown by inserting the hook 30 over the transverse rod or bail 28 projecting from the opposite end of the connecting member. It is thus obvious that no matter what position the wearer of the strap assumes in use or what rapid panting or other movements the wearer's body goes through, that the connecting member expands sufficiently in use to compensate for these movements, the springs 52 yielding for this purpose, the springs 52 causing the parts of the connecting member to resume their original positions when the strain is released.

It is apparent that the fixed strap end 16 may be readily unhooked when it is no longer desired to keep the strap attached.

It is apparent, therefore, that we have provided a novel type of adjustable strap automatically extensible on movements of the object strapped with the advantages described above.

It is understood that our invention is not limited to the specific embodiments shown and that various deviations thereof may be made without departing from the spirit and scope of the appended claims.

What we claim is:

1. An adjustable strap automatically extensible on movement of the object strapped, comprising a non-extensible flexible strap of a length to substantially encircle a limb or a body torso or to join two article portions together, having a rigid end portion having the tip thereof looped under said end portion to provide a hook and an adjustable end comprising a flexible end portion looped rear-

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wardly to provide a flexible loop, cooperating fastening elements secured to adjacent faces of said strap and looped end whereby the length of the loop may be adjusted, a strain compensating connecting member, bails attached to each end of said strain compensating member on the underside thereof for receiving said respective hook and loop, one of said bails being resiliently connected to said strain compensating member.

2. An adjustable strap automatically extensible on movement of the object strapped, comprising a non-extensible flexible strap of a length to substantially encircle a limb or a body torso or to join two article portions together, having a rigid end portion having the tip thereof looped under said end portion to provide a hook and an adjustable end comprising a flexible end portion looped rearwardly to provide a flexible loop, cooperating fastening elements secured to adjacent faces of said strap and looped end whereby the length of the loop may be adjusted, a strain compensating connecting member, a bail attached to each end of said strain compensating member on the underside thereof for receiving said respective hook and loop, both of said bails being resiliently connected to said strain compensating member.

3. An adjustable strap automatically extensible on movement of the object strapped, comprising a non-extensible flexible strap of a length to substantially encircle a limb or a body torso or to join two article portions together, having a rigid end portion having the tip thereof looped under said end portion to provide a hook and an adjustable end comprising a flexible end portion looped rearwardly to provide a flexible loop, cooperating fastening elements secured to adjacent faces of said strap and looped end whereby the length of the loop may be adjusted, a strain compensating connecting member, a bail attached to one end of said strain compensating member on the underside thereof for receiving a respective one end of said strap, said bail being resiliently connected to said strain compensating member, said strain compensating member having transverse slot means adjacent the opposite end thereof for receiving said other end of said strap.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,423,218	Hurst	July 18, 1922
1,435,307	Jones	Nov. 14, 1922
1,779,798	Beck	Oct. 28, 1930
1,894,653	Wirth	Jan. 17, 1933
2,160,368	Monesson	May 30, 1939

FOREIGN PATENTS

Number	Country	Date
493,865	Great Britain	Mar. 13, 1930
301,331	Great Britain	Nov. 7, 1929
729,769	France	May 2, 1932