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2,316,102

LACING EQUIPMENT

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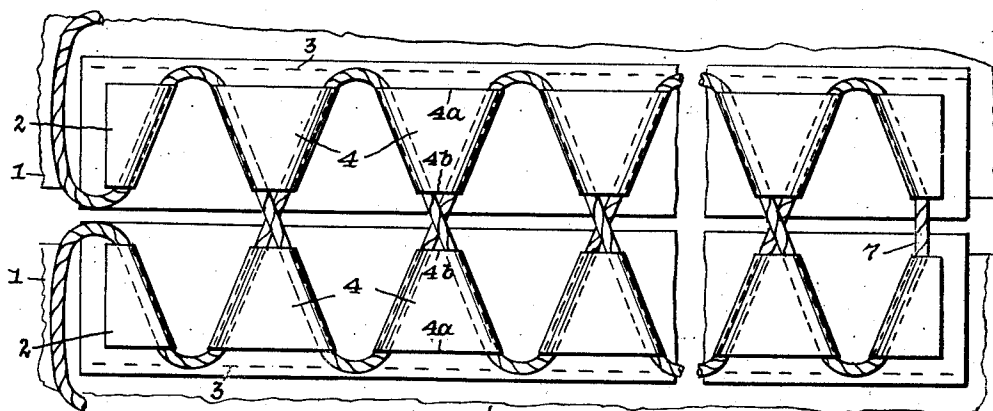


Fig. 1.

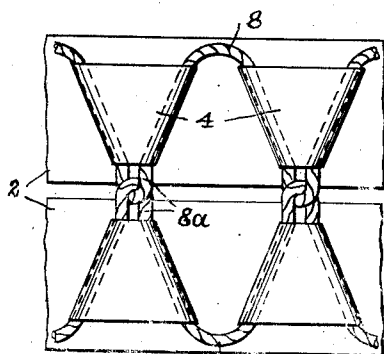


Fig. 2.

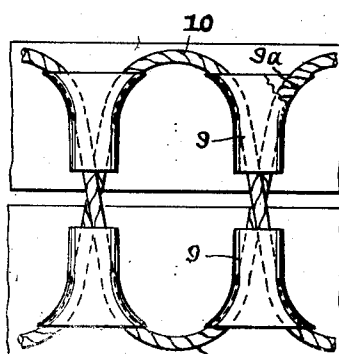


Fig. 3.

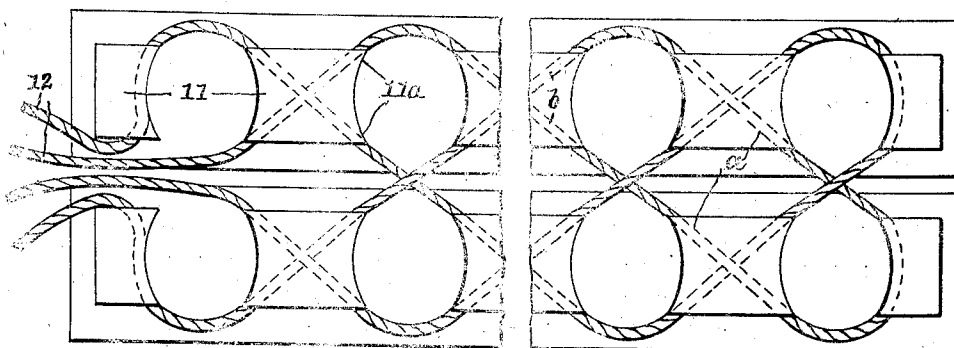


Fig. 4.

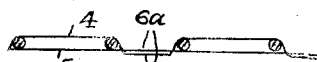


Fig. 5.

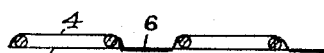


Fig. 5.

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LACING EQUIPMENT

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19 Claims. (Cl. 24-140)

This invention relates to the art of connecting together opposed marginal parts of sheet material, as those of a garment. According to my invention each of the two marginal parts is provided with a series of loops extending as a series lengthwise thereof, and through the loops of the two such series flexible lacing means is reeved (by which I mean flexible strand portions) whereby to draw said marginal parts more or less closely together. In so far as the loops are concerned my invention is preferably characterized in one or more of the following ways:

By the loops being formed as portions of tapes or bands to be stitched or otherwise attached to the material and in that sense then constituting the marginal parts thereof to be joined.

By the loops existing with their opposed free edges extending lengthwise of the series of loops.

By each loop existing as one of two superposed plies, so that the other ply will serve as a backing for the lacing means and thus assume its abrading action and ease its pressure on the wearer.

By each loop existing formed interiorly divergent or flaring toward at least one edge, as the one the more remote from the other series of loops when their said free edges extend lengthwise of the series of loops.

By each loop existing as a bulging portion of the corresponding marginal part.

In the drawing:

Fig. 1 shows my invention in one form thereof, in plan and partly broken away;

Figs. 2 and 3 show in plan fragments of two other forms, a portion in Fig. 3 appearing broken away;

Fig. 4 shows another form in plan and partly broken away; and

Figs. 5 and 6 are edgewise views of alternative ways of forming the loops.

Describing each example as such:

In Fig. 1 let 1—1 be portions of sheet material whose marginal parts to be joined are tapes 2—2 stitched thereto, say each along the line 3. These tapes may be of woven material and each is formed with a longitudinal series of loops 4. The free edges 4a—4b of the loops extend lengthwise of the series in this example. The loops are here divergent or tapering in form, with their outer free edges 4a the longer. Each region occupied by a loop preferably also is occupied by a backing portion 5 (Figs. 5 and 6) behind and of the same area as the loop. The loops are here of such dimension crosswise of the corresponding tape as to reach short of what is to be the latter's longitudinal edges. In the weaving the part of the

tape between any two of the mentioned regions is maintained single-ply, as at 6 in Fig. 5, or it may be two-ply, as at 6a in Fig. 6. But within each of such regions and to form any loop 4 and mentioned backing portion 5 it is developed two-ply, these two plies being detached from each other throughout the corresponding said region. The loops of the two tapes are equal in number and alike in form and all spaced at equal intervals. Thus each of the aforesaid marginal parts may be regarded as having each of the alternate ones of aligned sheet portions thereof that exist as a series which extends lengthwise of such part including two superposed plies which together form a loop and connect sheet portions of said part which next adjoin the loop at opposite sides thereof, the latter sheet portions being in the present example sheet portions actually in said series.

The lacing means in this example consists of a single strand 7 which may be regarded as having had its ends first passed from the inner and toward the outer margins of the tapes respectively through their extreme right-hand loops; then passed back through the next two loops, crossing each other; and so on until all the loops are penetrated. On completion of this operation, when either portion of the strand extending from one end to the other of the series of loops is subjected to strain the two tapes will be drawn together, from which it will be incidentally obvious that such portions need not necessarily be, as in this example, parts of an integral or single strand but as in any event strand portions each adapted when subjected to strain in any way to draw the two tapes together.

In Fig. 2, the tapes 2 and their loops 4 are the same as in Fig. 1 but the lacing means is as follows: Strand portions 8 have bights 8a formed therein at intervals and they have their bights penetrating in succession the loops of the respective tapes, to wit, so that all the bights of either strand portion reach in a direction from the outer toward the inner margin of the corresponding tape; and the bights of one strand portion are intercoupled with the respective bights of the other strand portion between the two series of loops, to wit, by crossing the strand portions.

Of course, even though the loops be tapered some localized strain is imposed by the lacing means on the outer ends of the loops, or the ends of the loops of each series which are the more remote from the other series, and this may in some instances result in the loops being cut or

torn and in distortion of the material as a whole, wherefore my invention contemplates, as shown by Fig. 3, so forming the loops as to disperse the strain. Accordingly, the outer end portions of the loops 9 in that figure are formed to flare as shown, or arcuately, or so that interiorly each side 9a of a loop is deflected from the opposite side in a curve. 10 designates the strand portions, here assumed to be the same as in Fig. 1.

Fig. 4 is present to show another type of lacing means and the form of loops preferably used in connection therewith so as to withstand the localized strain which such means would otherwise impose thereon. Each loop 11 flares arcuately at both ends (or so that at each end each side of the loop is deflected from the opposite side in a curve), as at 11a. The lacing means comprises two separate strand portions 12. Consider either strand portion: It is first passed through the extreme right-hand loop of one tape; then its two ends are passed through the next or second loops, respectively, of the two tapes, as at a; then such ends are passed through the third loop of the other tape, crossing each other, as at b; and these steps are repeated throughout the length of the equipment. The other strand is reeved in the same manner, starting with respect to the other tape. In this form the lacing means crosses the tapes at such an angle in each instance as to make it desirable, in order to avoid straining of or injury to the loops, to form the latter flaring interiorly toward both of their free edges.

In any event, each loop has appreciable area and so forms a sheet portion of the marginal part of which it is an integral segment, thus being well adapted to withstand the strain imposed by and appreciably covering the lacing means.

The ply 4 of any loop is preferably developed with a bulge or fullness as shown by Figs. 5 and 6, leaving the remainder, or "ground," of the material in flat state. Thereby the lacing may be effected with facility.

Of course the lacing means may be reeved through the loops in various ways so long as it is adapted to bring the margins of the material together uniformly.

Having thus fully described my invention, what I claim is:

1. Flexible sheet material having two opposed marginal parts lying in approximately the same plane and to be drawn together, in combination with flexible lacing means for drawing said parts together, each of said parts having each of the alternate ones of alined sheet portions thereof that exist as a series which extends lengthwise of such part including two superposed plies which together form a loop and connect sheet portions of said part which next adjoin the loop at opposite sides thereof, and said lacing means being reeved through successively disposed loops of both said parts and thereby connecting the latter together.

2. The combination set forth in claim 1 char-

acterized by each loop being formed interiorly flaring toward a free edge thereof.

3. The combination set forth in claim 1 characterized by each loop being formed interiorly flaring toward each free edge thereof.

4. Flexible sheet material having two opposed marginal parts lying in approximately the same plane and to be drawn together, in combination with flexible lacing means for drawing said parts together, sheet portions of said parts existing integral therewith and as loops arranged in series extending and having their free edges extending lengthwise of such parts, respectively, and said lacing means being reeved through successively disposed loops of both said parts and thereby connecting the latter together.

5. Flexible sheet material having two opposed marginal parts lying in approximately the same plane and to be drawn together, in combination with flexible lacing means for drawing said parts together, sheet portions of said parts existing as loops arranged in series extending and having their free edges extending lengthwise of said parts and the portions of the loops of each part remote from the other part interiorly flaring, and said lacing means being reeved through successively disposed loops of both said parts and thereby connecting the latter together.

6. Flexible sheet material as set forth in claim 5 characterized by said sheet portions existing integral with said parts.

7. Flexible sheet material having two opposed marginal parts lying in approximately the same plane and to be drawn together, in combination with flexible lacing means for drawing said parts together, integral sheet portions of said parts existing as loops arranged in series extending and having their free edges extending lengthwise of said parts and the portions of the loops of each part remote from and also adjacent the other part interiorly flaring, and said lacing means being reeved through successively disposed loops of both said parts and connecting the latter together.

8. Flexible sheet material having two opposed marginal parts lying in approximately the same plane and to be drawn together, in combination with flexible lacing means for drawing said parts together, each of said parts having each of the alternate ones of alined sheet portions thereof that exist as a series which extends lengthwise of such part including two superposed plies which together form a loop and connect sheet portions in said series which next adjoin the loop at opposite sides thereof, and said lacing means being reeved through successively disposed loops of both said parts and connecting the latter together.

9. The combination set forth in claim 8 characterized by each loop being formed interiorly flaring toward a free edge thereof.

10. The combination set forth in claim 8 characterized by each loop being formed interiorly flaring toward each free edge thereof.

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