

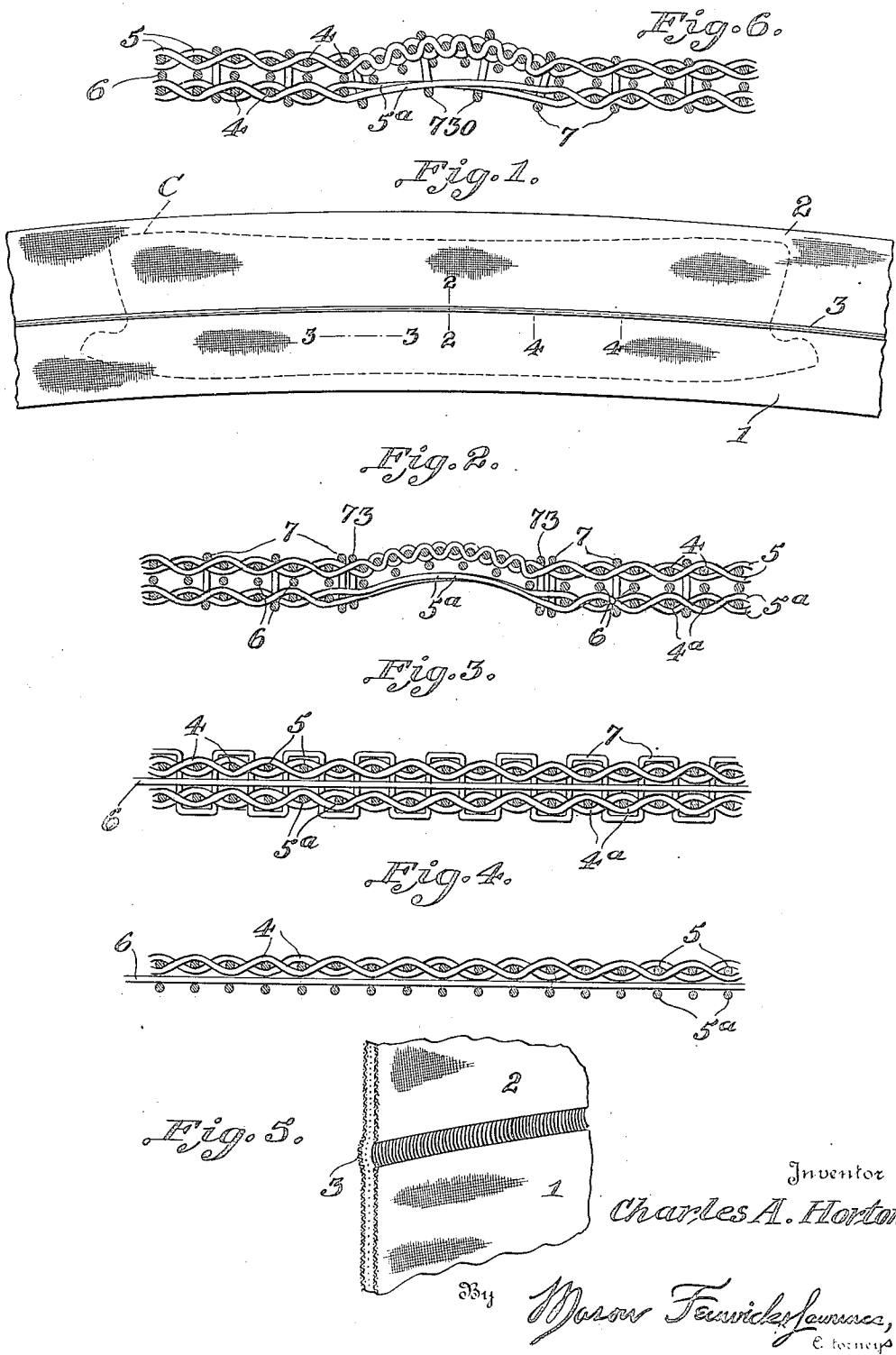
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C. A. HORTON

WEBBING FABRIC

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WEBBING FABRIC.

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To all whom it may concern:

Be it known that I, CHARLES A. HORTON, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Webbing Fabrics; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable other skilled in the art to which it appertains to make and use the same.

This invention relates to woven fabrics and to collars or like folded and foldable articles composed of them, said fabrics having panels connected by a relatively narrow zone along which the panels may be more readily folded than elsewhere. It more particularly appertains to multiply fabrics (and products comprising them) such as may be most conveniently woven in a narrow ware or webbing loom, and in which the warp yarns or threads are curved in the plane of the fabric parallel with each other, the picks of weft or filling stretching radially or normal to the warp threads at their points of intersection with the latter, said fabric having a narrow fold zone curved parallel with the warp threads.

Fabrics of the kind thus generally described are well known and are suitable material from which one piece folded collars or the like can be cut. Collars made from fabric of this type have the advantage of retaining their shape unstarched, are free from seams and double thicknesses at the folded edge, and do not wrinkle after the manner of those collars that are made of several thicknesses of cloth, stitched together, in order to provide sufficient body to enable the collar to maintain its form while being worn.

Heavy fabrics, interwoven or otherwise, having the warp yarns running in parallel lines curved in the plane of the fabric when flattened out, and methods of weaving them have been known for many years. It has also been long known that turnover or fold collars of one integral piece may be cut from multiply fabric; and in patent to Morgan 1,254,340, patented January 22, 1918, and others of recent date, it has been proposed to make collars in one piece from multiply interwoven fabric having a warp curved in the plane of the fabric and having a curved flexible fold line produced by

omitting certain of the warp threads and reducing their number at the fold line or otherwise weakening the fabric at the fold line.

The objects of my invention are to produce one piece woven collars or the like from multiply interwoven woven fabric composed of two panels woven flat or substantially in the same plane and connected by a fold zone having substantially equal strength and at least equal wear resisting qualities with the remainder of the fabric; to produce a fabric for collars or the like of multiply weave comprising two panels woven in substantially the same plane connected by a fold zone the back ply of which is devoid of warp threads and the face ply of which has double the number of warp threads found elsewhere in the fabric in the same width; to provide a fabric of the kind described with a fold zone convexed transversely so as to produce a definite crimp or fold set in the fold zone rendering the fabric more easily foldable along said zone, and, in general, to produce a fabric and products therefrom having a fold zone either straight or curved of superior wear resisting quality, but enabling the fabric to be more easily foldable along the fold zone than elsewhere.

And the invention consists in a multiply fabric and foldable one piece woven collars and the like made therefrom comprising two panels woven in substantially the same plane each panel having a face ply and a back ply bound together by binder threads, said panels being connected by a fold zone along which the fabric folds more easily than elsewhere, the face ply of the fold zone having a greater number of warp threads within a given width than the panels, and the back ply being devoid of warp threads.

By this construction greater wearing qualities are imparted to the face ply or the convex fold line of a collar or other folded article made from the fabric, the fabric more readily folds upon the fold zone and has a strength at the fold zone at least equal to that of the rest of the fabric.

In the accompanying drawings in which like reference characters designate like parts throughout the several views:

Figure 1 illustrates diagrammatically a

fragment of webbing made in accordance with this invention and having the outline of a turn over collar shown in dotted lines;

Figure 2 is a diagrammatic section taken transversely of the fold zone on the line 2—2 of Figure 1;

Figure 3 is a diagrammatic section taken longitudinally of the warp in one of the panels on the line 3—3 of Figure 1;

Figure 4 is a diagrammatic longitudinal section parallel with the warp of the fold zone;

Figure 5 is a perspective of a fragment looking at the back thereof, and

Figure 6 is a diagrammatic section across the fold zone of a modification.

The fabric shown consists of multiply interwoven webbing having a face ply, back ply and interposed stuffing, bound together by binder threads and composed of two panels united by a transversely convexed or crimped fold zone the convexity being produced by crowding the longitudinal threads in the face ply during the weaving operation, the longitudinal threads that would normally be in the back ply of the fold zone having been transferred to the face ply. It is understood that the fabric illustrated is exemplary, merely, and that the back ply may be woven of different material than the face ply and with a different number of threads to the inch.

In the drawings 1 indicates what is here termed the inner panel of the webbing, 2 the outer panel and 3 the fold zone.

The panels are of like weave and are composed of a face ply and back ply of plain weave with stuffer threads between, all stitched or bound together by binder threads. The face warp threads of the panels are designated 4, the back warp threads 4^a, the face weft or filling 5, the back weft or filling 5^a, the stuffer warp 6, and the binder threads 7.

In the fabric illustrated in Figure 2 the fold zone 3 contains double the number of warp threads to the inch in the face ply as compared with the face or back warp threads in the panels. It contains the same number of stuffer warp threads 6 to the inch as the panels; but the back ply is devoid of warp threads, they having been transferred to and woven in the face ply. There are thus in the fold zone exactly the same number of warp threads as are to be found in the same width of panel. In the fabric shown in Figure 2 the binder threads that would normally come within the intermediate portion of the fold zone have been shifted to the borders thereof, thus bringing two binders 7 and 7^a together at the edges of the fold zone, more clearly demarking the fold zone and rendering the fabric more susceptible of being folded with the panels back to back along the fold zone.

By this construction it will be apparent that the fabric may be folded readily along the fold zone and that collars or like folded or foldable articles made therefrom will present an exterior fold edge more resistant to wear than the other portions of the fabric because of the closeness of the weave, and of substantially equal strength with the remainder of the fabric owing to the fact that it contains the same number of warp threads per inch. As shown, assuming that there are about eighty warp threads to the inch in the face ply of the fabric, the width of the fold zone would be about one thirteenth of an inch and in it there would be eighteen warp threads which is the same number that occurs in a space of equal width in the panels.

In the modification illustrated in Figure 6, the binder threads in the fold zone are spaced as in the panels, the two binders tending to draw the filling 5^a toward the convexed face ply. In this form the total number of threads to the inch in the fold zone is the same as in the panels, the difference being that the warp threads that would be in the back if the weave of the panels were continued in the fold zone have been transferred to the face, thus making the face more resistant to wear by reason of the greater closeness of the weave and at least equal in strength to the rest of the fabric and more readily foldable along the fold zone than elsewhere.

Turn over or folded collars may be cut from fabric or webbing of the described construction so that the fold line of the collar will follow along the fold zone of the fabric. Collars made from this fabric have superior wearing qualities at the folded edge where the wear is necessarily greatest and, owing to the curvature of the fabric and fold line, one piece collars made from this fabric will properly conform to the neck of the wearer like the ordinary starched collar having the curved fold line and, being without seams adjacent the fold, may be comfortably worn.

These fabrics may be woven on known narrow ware or webbing looms using the usual number of harnesses. In order to produce a curved webbing the warp threads should be fed progressively faster from the concave selvage edge of panel 1 to the convex selvage edge of panel 2; and the warp threads may be fed progressively faster, as described, by the use of roughened, conical tension rolls which engage the webbing between the breast beam and the cloth beam or cloth roll of the loom, those portions of the webbing that are gripped between the larger diameters of the tension rolls being fed faster than those portions that are gripped between the smaller diameters.

A rod or small roll either tapered or dis-

posed at an angle corresponding to the taper of the tension rolls, should be fixed to the breast beam to guide the webbing of the tension rolls. The progressive difference of feed of the warp yarns from concave edge to convex edge of the fabric may be permitted by providing a larger number of warp beams than are required in weaving straight fabrics. In weaving straight webbing of the kind described three warp beams are necessary since the face and back warp, the stuffer warp and the binders are of different lengths in the woven material and require to be delivered from the warp beams at different speeds. By providing four sets of three each,—twelve beams in all,—sufficient allowance for variations of speed delivery of the warp yarns necessary to produce the curvature may be afforded. Although, theoretically it might be deemed desirable to have a larger number of warp beams, as each successive warp thread, from concave to convex edge, travels slightly faster, in practice it is found that the proper graduations of speed may be afforded by twelve warp beams, the stretch of the yarns being sufficient to compensate; and to this end it will be understood that the beams should be so disposed as to provide a long run of warp between the cloth and the warp beams.

Having described my invention what I claim and desire to secure by Letters Patent is:

1. A multiply interwoven fabric comprising panels connected by an intermediate fold zone along which the fabric is more easily foldable than elsewhere, the back ply of the fold zone being devoid of longitudinal threads and the longitudinal threads in the face ply thereof being closer together than the longitudinal threads in the panels.

2. A multiply interwoven fabric comprising panels connected together by an intermediate fold zone along which the fabric is more easily foldable than elsewhere, the back ply of the fold zone being devoid of longitudinal threads and the face ply thereof having twice as many longitudinal threads to the inch as the face ply of the panel.

3. A multiply interwoven fabric comprising panels connected by an intermediate fold zone, the back ply of the fold zone being devoid of longitudinal threads and the longitudinal threads of the face ply thereof being crowded together in such manner as to cause the fold zone to bulge transversely from the face of the fabric.

4. A multiply interwoven fabric comprising panels connected by an intermediate fold zone transversely convexed in the weave, the back ply of the fold zone being devoid of back longitudinal threads and the face ply having the face longitudinal threads lying closer together than in the panels.

5. A multiply interwoven fabric comprising panels connected by an intermediate fold zone transversely convexed in the weave, the back ply thereof of the fold zone being devoid of back longitudinal threads and the face ply having twice as many longitudinal threads to the inch as the face ply of the panels.

6. A multiply interwoven fabric comprising panels connected by an intermediate fold zone, said fabric comprising a face ply, a back ply and interposed stuffer threads, the back ply of the fold zone being devoid of back longitudinal threads and the face ply having the longitudinal threads crowded together in such manner as to cause the face ply of the fold zone to bulge transversely from the face of the fabric, and longitudinal stuffer threads in the fold zone between the face ply and the transverse threads of the back ply.

7. A multiply interwoven fabric comprising panels connected by an intermediate fold zone, the face ply of the fold zone having the longitudinal threads crowded together in such manner as to cause it to bulge transversely from the face of the fabric and the back ply following the general contour of the bulge, and spaced apart longitudinal binder threads binding the back ply to the face ply.

8. A multiply interwoven fabric comprising panels connected by an intermediate fold zone transversely convexed in the weave, the back ply of said fold zone being devoid of longitudinal threads, the face ply thereof having twice the number of longitudinal threads to the inch as the face ply of the panels, and spaced apart binder threads binding the transverse threads of the back ply to the face ply.

9. A multiply interwoven fabric having a face and a back ply and intermediate stuffer threads, said fabric comprising panels connected by an intermediate fold zone transversely convexed in the weave, the back ply of the fold zone being devoid of longitudinal threads, said fold zone having twice the number of face longitudinal threads to the inch as the face ply of the panels, and an equal number of stuffer threads, and spaced apart binder threads binding the transverse threads of the back ply and stuffer threads to the convexed face ply.

10. A multiply interwoven fabric comprising two panels, the warp threads of which extend in lines curved in the plane of the fabric, and a connecting curvilinear fold zone, along which the fabric folds more easily than elsewhere, the back ply of the fold zone being devoid of back warp threads, and the face ply thereof having twice as many warp threads to the inch as the face ply of the panels.

11. A foldable cloth article consisting of panels and an intermediate fold zone, all woven as one integral multiply fabric, the back ply of the fold zone being devoid of longitudinal threads and the longitudinal threads of the face ply thereof being crowded together in such manner as to cause it to bulge transversely from the face of the fabric when in flattened condition and impart to the article a tendency to fold along said fold zone.

12. A foldable cloth article consisting of an inner curvilinear panel constituting a neck band, an outer curvilinear panel and an intermediate curvilinear fold zone, all woven with curvilinear warp as one integral multiply fabric, the back ply of the fold zone being devoid of warp threads, and the warp threads of the face ply thereof being crowded together in such manner as to cause it to bulge transversely from the face of the fabric, and impart to the collar a tendency to fold along said fold zone.

13. A foldable cloth article consisting of

panels, and an intermediate unweakened fold zone, all woven as one integral multiply fabric, the back ply of the fold zone being devoid of longitudinal threads and the longitudinal threads of the face ply thereof being crowded together in such manner as to cause it to bulge transversely and impart to the article a tendency to fold along said fold zone, the total number of warp threads in the fold zone being as great as in an equal width of panel.

14. A foldable cloth article consisting of panels and an intermediate fold zone, all woven as one integral multiply fabric, the face ply of the fold zone having the longitudinal threads crowded together in such manner as to cause it to bulge transversely from the face of the fabric and the back ply following the general contour of the bulge, and spaced apart longitudinal binder threads binding the back ply to the face ply.

In testimony whereof I affix my signature.

CHARLES A HORTON