J. L. MORGAN.

COLLAR.

APPLICATION FILED MAY 22, 1917.

1,254,339.

Patented Jan. 22, 1918.

3 SHEETS—SHEET 1.

Fig. 1.

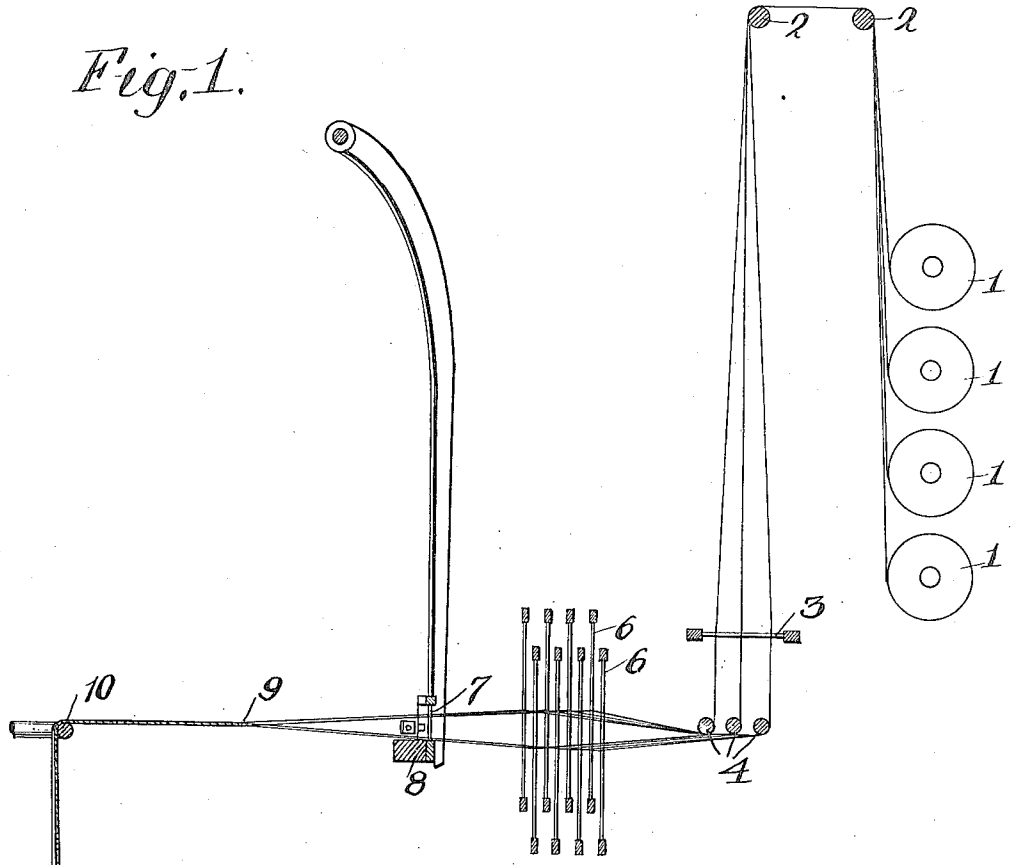


Fig. 2.

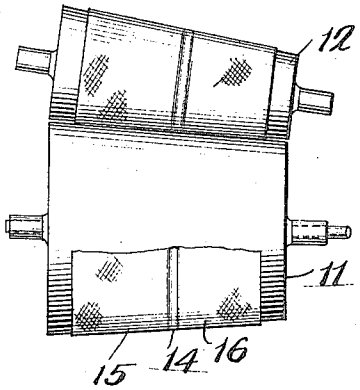
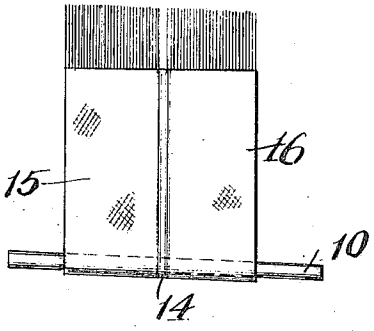


Fig. 3.



Inventor

John Lawrence Morgan

By his Attorneys

Dennis Davis Warren & Edmonds

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3 SHEETS—SHEET 2.

Fig. 4

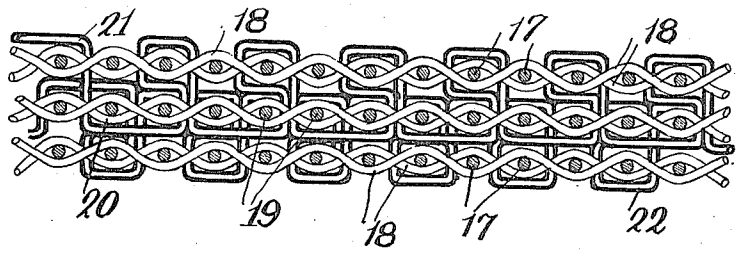


Fig. 5

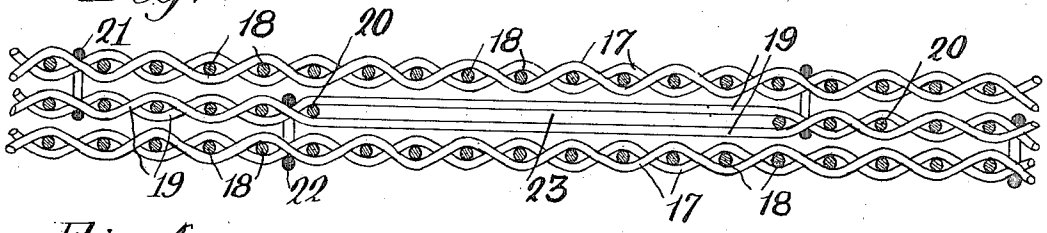


Fig. 6.

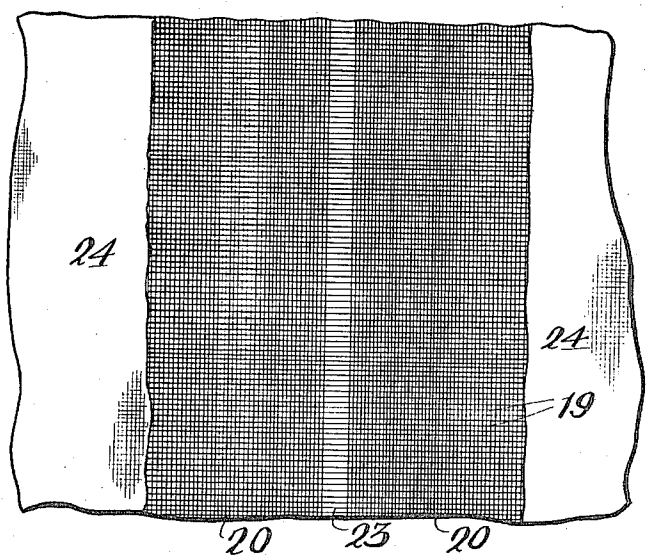
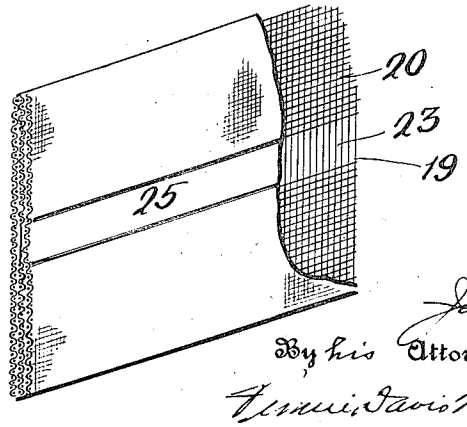


Fig. 7



Inventor

John Lawrence Morgan

By his Attorneys

Fennemore, Davis, Marvin & Edmonds

J. L. MORGAN.

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3 SHEETS—SHEET 3.

Fig. 8.

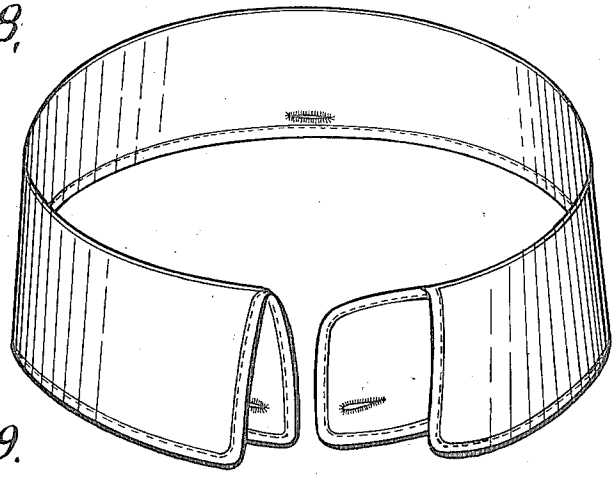


Fig. 9.

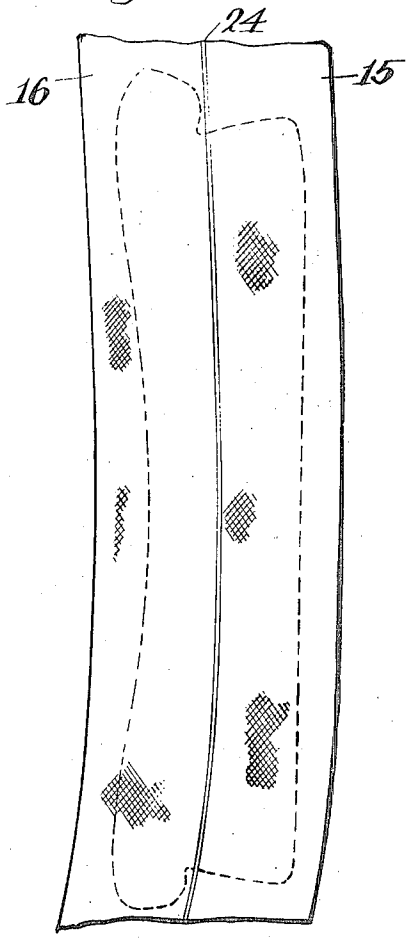


Fig. 10.

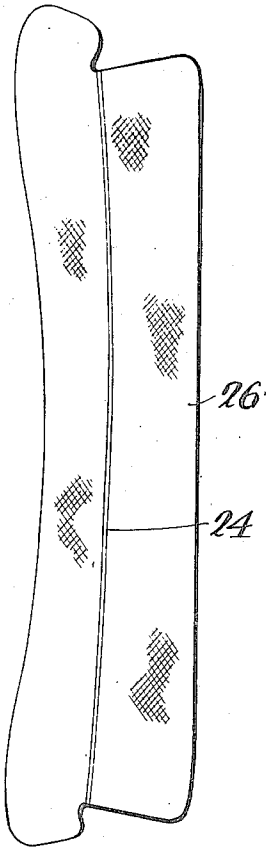
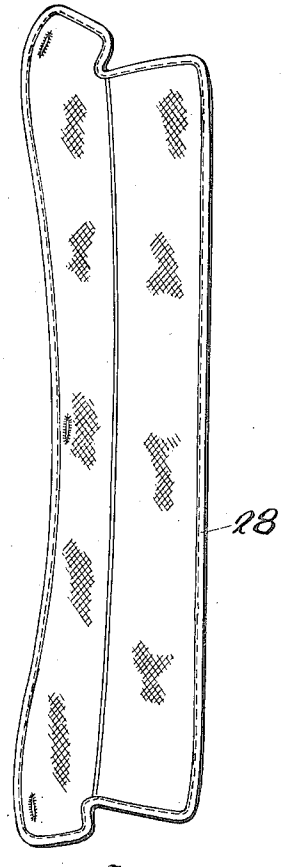


Fig. 11



Inventor

John Laurence Morgan

By his Attorneys

Kenyon Davis Marvin & Edmonds

UNITED STATES PATENT OFFICE.

JOHN LAWRENCE MORGAN, OF EVERETT, MASSACHUSETTS, ASSIGNOR TO JOHN MANNING VAN HEUSEN, OF BOSTON, MASSACHUSETTS.

COLLAR.

1,254,339. Specification of Letters Patent. Patented Jan. 22, 1918.

Application filed May 22, 1917. Serial No. 170,224.

To all whom it may concern:

Be it known that I, JOHN LAWRENCE MORGAN, a citizen of the United States, residing at #34 Evelyn road, Everett, in the county of Middlesex, State of Massachusetts, have invented certain new and useful Improvements in Collars; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in folding collars, and more particularly to folding collars of multiply fabric woven in a single piece and provided with a weakened or fold portion, the fabric being so woven that the outer portion of the collar will be longer than the inner portion.

The invention will be described more in detail in connection with the accompanying drawings which illustrate, more or less diagrammatically, the collar and the collar fabric, and the method and apparatus for weaving the fabric. In the accompanying drawings—

Figure 1 is a diagrammatic representation of certain of the working parts of the loom suitable for the manufacture of the collar fabric.

Fig. 2 is a face view of the tapered tension rolls of Fig. 1.

Fig. 3 is a plan view of a piece of the fabric passing over the angular or skewed guide rod.

Fig. 4 is an enlarged diagrammatic cross section of the fabric taken on a line parallel to the warp thread, that is, a section lengthwise of the fabric.

Fig. 5 is a similar enlarged diagrammatic cross section taken at right angles to that of Fig. 4, that is, a section taken parallel to the weft thread of the fabric.

Fig. 6 is a face view of the fabric having a portion broken away to expose certain of the warp and weft threads.

Fig. 7 is a diagrammatic representation in perspective of a piece of the fabric.

Fig. 8 shows in perspective a collar embodying the invention.

Fig. 9 shows a portion of the fabric with the collar blank indicated thereon in dotted lines.

Fig. 10 shows the collar blank from the fabric, and

Fig. 11 shows the blank bound and in its finished state ready to be folded.

In describing the invention more in detail in connection with the accompanying drawings and with the embodiment or embodiments of the invention illustrated thereon, it will be understood that the drawings as well as the description are intended to be illustrative of the invention and that variations and modifications can be made in the embodiment illustrated and described without departing from the spirit and scope of the invention.

Referring more particularly to Figs. 1 to 3, wherein the production of the collar fabric is illustrated, it will be seen that the warp and binder threads are carried in rolls 1—1 and from there pass over the guide rods 2 and then through the spacing frame 3 and around the guide rods 4 and through the frame 6—6. Each warp and binder thread, after passing through the thread supporting loop of the frame 6, passes through the reed 7 supported on the beam 8 and operating in a manner which will be readily understood. The cloth is completely formed at the point 9 and thence passes over the skewed or angular guide rod 10 and between the tapered tension rolls 11 and 12 to the take-up roll 13.

The tapered tension rolls are shown in Fig. 2 and are of such proportions that the fabric produced will have a predetermined greater length on one side than on the other. This lengthening of the fabric on one side, as compared to the other, is accomplished by the tapered rolls, by pulling and thereby feeding the warp threads through the frames in proportion to the circumference of the tapered rolls at the point where a given warp thread passes over the rolls in the fabric. It will thus be noted that while the tension rolls operate on the completed cloth, the effect of the operation is upon the warp threads before the weft threads have been put in to form the fabric, and hence this action is upon the fabric at the time of its formation.

The fabric thus produced and utilized in the manufacture of the novel collar of the present invention is a multiply fabric; and the particular fabric illustrated is a three-ply fabric. This three-ply fabric consists of an upper and a lower fabric of the ordinary weave and a middle filling fabric which may or may not be of the same character as the surface fabric. The three fabrics, or the three plies of the three-ply fabric, are held together by suitable binder threads.

The construction of the fabric, according

to the preferred embodiment of the invention, is illustrated somewhat diagrammatically in Figs. 4 to 7 inclusive.

Referring first to Fig. 4 it will be seen that the weft threads 17—17 of the upper and lower fabrics or plies are woven with the warp threads 18—18, while the weft threads 19—19 of the middle fabric are woven with the warp threads 20—20. The upper and middle fabrics are shown as held together by binder threads 21 while the middle and lower fabrics are shown as held together by binder threads 22. The fabric thus produced is a closely bound three-ply fabric of firm texture.

The section of Fig. 5 is taken at right angles to that of Fig. 4 and shows the warp threads 17—17 of the upper and lower fabrics woven with the weft threads 18—18 and the warp threads 20 of the middle fabric woven with the weft threads 19—19. The binder threads 21, 22 for binding the upper and lower fabrics to the middle fabric are also illustrated in Fig. 5.

In order to provide for a weakened or fold portion where the folding of the collar takes place, the fabric may be weakened at this portion as by the omission of certain of the warp threads of one or more of the plies of the fabric. In the structure shown in Fig. 5, eight of warp threads 20 of the middle ply or fabric are omitted, and the warp threads 19—19 are carried straight across without weaving. As the result of this construction, there is produced a weakened or fold portion extending lengthwise of the fabric. So also, where the threads are omitted from the central layer or ply of the fabric, the outer plies present an uninterrupted and finished appearance.

In Fig. 6 the fabric is shown with portions broken away to expose the warp threads 20 and the space 23 where the warp threads have been omitted and where the weft threads are carried across without weaving. The weakened or fold portion 25 is further indicated in Fig. 7 as a well defined line or space along which the folding of the collar takes place.

The fabric may be produced of different widths and with variations in its constructions and proportions, as will be readily understood. The fabric may, for example, have a width of about five and one-half inches, and be divided by the weakened or fold portion 14 into a panel 15 about three inches wide and a panel or portion 16 slightly less than two and one-half inches wide, as indicated in Fig. 3.

It will also be evident that the panel 15 can be made of a predetermined greater length than the panel 16, this regulation being effected by the contour or taper of the tension rolls. The fabric may, for example be about 16½% longer at the outer edge of the longer panel than at the inner edge of the shorter panel. For example, if the right hand warp thread of the fabric illustrated in Fig. 2 travels at the rate of 36 inches in a given period of time, the left hand warp thread may travel about 42½ inches in the same time interval; while any intermediate warp thread will travel a proportional distance, according to its position in the fabric.

The fabric may for example be produced having three hundred and fifty-two warp threads to the inch and two hundred weft threads to the inch, in which case there would be eighty-eight warp threads in each of the three plies or fabrics forming the face, the back, and the middle fabric, and eighty-eight binder threads divided between the two upper and the two lower plies of the fabric. The upper and lower binder threads are evenly distributed over the surface of the fabric, particular attention being paid to having a binder thread come at each edge of the space 23 (where certain of the warp threads are omitted in order to produce the weakened or fold portion).

In producing the collar from the finished fabric, the collar blank 26 may be stamped from the fabric as indicated in Fig. 9, and the blank thus produced, as shown in Fig. 10, may be then provided with a binding 28 to finish the edge of the collar. After addition of button holes the finished collar will be produced. This collar, before folding, will be flat as indicated in Fig. 11. The folding of the collar will take place along the weakened or fold portion produced in the fabric as above described.

It will be noted that the fabric as a whole has a "twist" in it and that the outer panel is woven longer than the inner panel. The fabric will thus partake of a curvilinear and the weakened or fold portion will likewise be curvilinear. The collar made from the fabric will similarly have a curvilinear fold portion as clearly indicated at 24 in Figs. 9 to 11. When the flat collar with this curvilinear set is folded, as indicated in Fig. 8, it will naturally assume a permanent curvilinear shape or set and will fold smoothly along the fold or weakened portion. Moreover, since the outer panel or folding portion of the collar is longer than the inner portion, the tendency of the outer portion to bind upon the inner portion will be avoided. By giving to the outer portion the proper increase in length, as compared to the inner portion, ample space can be provided to permit a neck-tie to pass freely between the inner neck-band portion of the collar and the outer turn-down portion.

Where the fabric as a whole is woven under the same tension, and where the outer turn-down portion is woven of a greater length than the inner portion, the collar will retain its form and its permanent curvilinear

set after laundrying. Moreover, by constructing the collar of fabric produced in the manner described, the collar will be flat when unfolded, and can be readily laundried without added precautions, while the collar will nevertheless assume the desired curvilinear shape when again folded.

It will be further noted that there are the same number of weft threads on each side of the weakened or fold portion, even though the fabric is longer on one side of this fold than on the other. It follows that there will be a greater number of weft threads per inch in the inner or neck-band portion of the collar than in the outer or turn-down portion. So also, since the warp threads are drawn or fed faster in the longer portion of the fabric, there will be a greater length of the warp threads in the longer or outer portion of the fabric or collar than in a corresponding portion of the inner or neck-band portion of the fabric or collar.

It will be understood that the weakened or fold portion of the collar can be obtained otherwise than by omitting certain of the warp threads from the intermediate layer of the fabric, as for example, by omitting threads from one of the outer layers, or from both one of the outer and from the intermediate layers. This weakening of additional layers may be desirable where a further weakening is desired to obtain the weakened or fold portion, as where more than three fabrics are woven together.

The different layers or plies of the fabric may be made of different material and this may in particular be desirable where a finer or more expensive material is desired in the outer ply than is necessary in the other plies of the fabric.

It will thus be understood that the collars may be made of different materials, or different combinations of materials; and also that the fabrics may be woven of different degrees of fineness. So also the collars may be made of various shapes and proportions, as will be readily understood.

I claim:—

1. A folding collar, made up of an inner panel and an outer panel woven in one piece under the same tension and having an intermediate edge-fold portion, the outer panel being longer than the inner so that the collar will take on a curvilinear set when folded, substantially as described.

2. A folding collar, made up of an inner panel and an outer panel of multiply fabric woven in one piece under the same tension and having an intermediate edge-fold portion, the outer panel being longer than the inner so that the collar will take on a curvilinear set when folded, substantially as described.

3. A folding collar, made up of an inner panel and an outer panel woven in one piece under the same tension and having an intermediate weakened edge-fold portion, the outer panel being longer than the inner so that the collar will take on a curvilinear set when folded, substantially as described.

4. A folding collar, made up of an inner panel and an outer panel of multiply fabric woven in one piece under the same tension and having an intermediate weakened edge-fold portion, the outer panel being longer than the inner so that the collar will take on a curvilinear set when folded, substantially as described.

5. A folding collar made up of an inner panel and an outer panel woven in one piece and having an intermediate edge-fold portion, the outer panel being woven with an inherent curvilinear set; substantially as described.

6. A folding collar made up of an inner panel and an outer panel woven in one piece and having an intermediate edge-fold portion, both the inner and outer panels being woven with an inherent curvilinear set; substantially as described.

7. A folding collar, made up of an inner panel and an outer panel woven in one piece and having an intermediate edge-fold portion, the outer panel being woven longer than the inner and being longer at its outer edge than at its inner edge; substantially as described.

8. A folding collar, made up of an inner panel and an outer panel of multiply fabric woven in one piece and having an intermediate weakened edge-fold portion, the outer panel being woven longer than the inner and being longer at its outer edge than at its inner edge; substantially as described.

9. A folding collar, made up of an inner panel and an outer panel of multiply fabric woven in one piece and having an intermediate edge-fold portion, the fabric being woven progressively longer from the free inner edge of the inner panel to the free outer edge of the outer panel; substantially as described.

10. A folding collar, made up of an inner panel and an outer panel of multiply fabric woven in one piece and having an intermediate weakened edge-fold portion, the fabric being woven progressively longer from the free inner edge of the inner panel to the free outer edge of the outer panel; substantially as described.

In testimony whereof I affix my signature.

JOHN LAWRENCE MORGAN.