

(No Model.)

C. VORWERK.  
WOVEN SKIRT WAISTBAND.

No. 383,842.

Patented May 29, 1888.

FIG. 1.

FIG. 2.

FIG. 3.

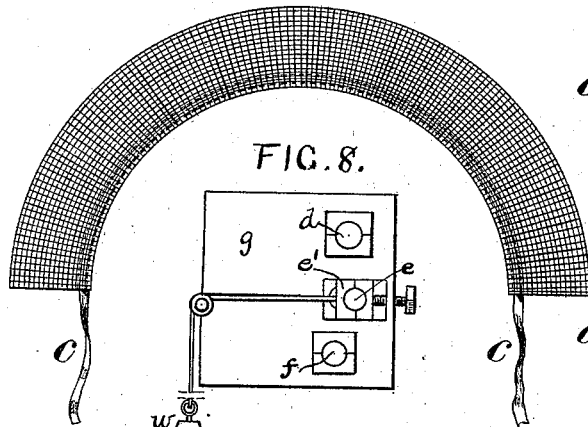


FIG. 4.

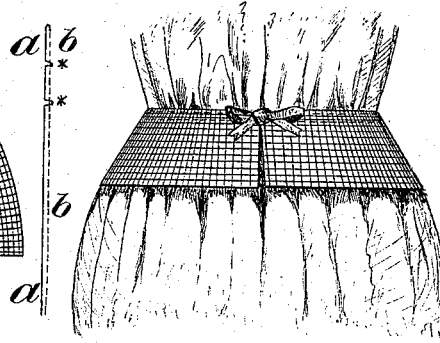


FIG. 5.

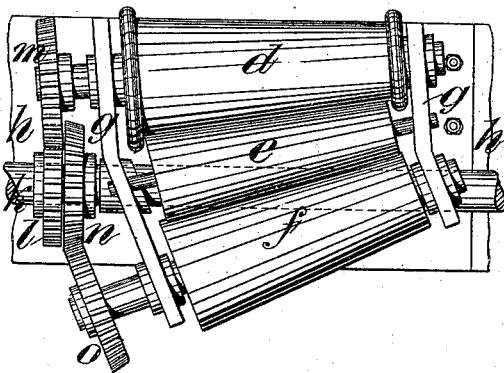


FIG. 6.

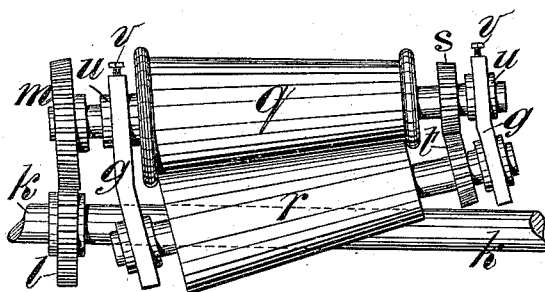
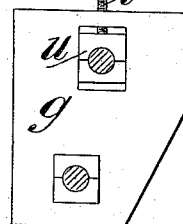


FIG. 7.



Witnesses  
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Inventor.  
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By his Attorneys  
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# UNITED STATES PATENT OFFICE.

CARL VORWERK, OF BARMEN, PRUSSIA, GERMANY, ASSIGNOR TO ADOLPH VORWERK, OF SAME PLACE.

## WOVEN SKIRT-WAISTBAND.

SPECIFICATION forming part of Letters Patent No. 383,842, dated May 29, 1888.

Application filed October 25, 1887. Serial No. 253,300. (No specimens.) Patented in Germany October 12, 1879, No. 9,733, and in England May 12, 1880, No. 1,938.

*To all whom it may concern:*

Be it known that I, CARL VORWERK, a subject of the Emperor of Germany, residing at Barmen, in the Kingdom of Prussia, Empire of Germany, have invented certain Improvements in Woven Skirt-Waistbands, (for which the firm of Vorwerk & Sohn, of which I was then senior partner, obtained a patent in Germany, No. 9,733, dated October 12, 1879, and in Great Britain, No. 1,938, dated May 12, 1880, as a communication from me to Edward K. Dutton,) of which the following is a specification.

My invention relates more particularly to the waistbands with which such articles of dress as skirts or petticoats are provided. Previously to this invention the said waistbands have been cut out of ordinary woven material to the required curved form. According to the present invention the web from which waistbands are cut is woven in such a manner as that one selvage is longer than the other, so that it has a curved form, and each waistband is woven with its lining connected in weaving by one edge with the outer material, and also at one or more points in the width of the material, the space between the united selvages and the first line of intermediate connection serving for a running tape, when such is required. The weaving is effected in a ribbon-loom, or in a similar or suitable loom. Waistbands made from the improved material are stronger, neater, and more durable than ordinary bands, and are produced with an economy of material. In the weaving of the improved material conically-formed taking-up rollers are employed. In the arrangement adopted when carrying the invention into effect three conical rollers are used—namely, two outer rollers and an intermediate roller of smaller diameter; but the taking up may be effected by using two conical rollers.

In order that the invention may be fully understood, I have attached herunto a sheet of drawings, to which reference will be made hereinafter.

In the accompanying sheet of drawings, Figures 1 and 2 indicate the form in which the improved waistbands are produced, and Fig. 3 represents such a band in position upon the

wearer. Fig. 4 is an elevation from the inside; and Fig. 5 an end view, partly in section, of the taking-up apparatus having three conical rollers employed in the weaving of the waistbands. Fig. 6 is an elevation of an apparatus in which two conical rollers are employed. Fig. 7 is a view of the bearings for the rollers shown in Fig. 6, and Fig. 8 is a view of the bearings of the rollers shown in Fig. 4.

The waistband is woven with two sets of warps, one set being composed of yarns suitable to form the face of the band and the other set being suitable to form a lining-cloth.

In Fig. 2, which is a sectional view of the band, *a* represents the outer cloth, and *b* the lining-cloth. In the weaving certain of the picks are woven into both cloths, so as to connect them together, as seen at \*\*, and the two cloths are also firmly woven together at one selvage. A running tape can be drawn into the space between the connected selvages and the line of connection \*, or into the other indicated space, or into any other space formed in the same manner. Such a tape is represented by *c* in Fig. 1. The waistband might, however, be secured to the person by a buckle or by buttons or attached ends. Owing to the curved form of the band, it sits well upon the waist of the wearer, and as the weft-threads are radials of the curve they lie in the direction of the strain when the band is in use, and are therefore better capable of sustaining the weight of the skirt without alteration of form in the band.

In Figs 4 and 5, *d*, *e*, and *f* are three conically-shaped rollers having axles which are mounted in a suitably-formed bracket, *g*, which is secured to the breast-beam *h* of the loom. The rollers *d* and *f* are taking-up rollers, and they revolve in fixed bearings; but the bearings *e*, Fig. 8, of the intermediate roller, *e*, are fitted to slide or are slotted so that the said roller can be moved into the space between the other rollers and pressed against them, the said space being a little less than sufficient to permit of the intermediate roller passing through. The under roller, *f*, is made slightly larger in diameter or is caused to revolve somewhat more quickly than the upper roller,

*d*, so as to put a certain strain upon the web as it passes through the apparatus, and by this means the intermediate roller, *e*, is drawn by the web into contact with the two other rollers.

At the beginning of the operation a weight or spring, such as at *w*, Fig. 8, may be employed to press the roller *e* inward; but after the web has been sufficiently advanced to pass over all the rollers such weight or spring may be dispensed with. The taking-up rollers receive motion from a shaft, *k*, which may be the ordinary shaft which actuates the taking-up motion in a loom constructed to weave a number of narrow webs—such, for example, as a ribbon-loom. Upon the said shaft is fixed a spur-wheel, *l*, which gears with a spur-wheel, *m*, which is fixed upon the axle of the roller *d*. These wheels by preference are made of such a bevel form as will suit the inclination of the axle of the roller with respect to the axis of the said shaft. Upon the said shaft *k* is also fixed a second bevel-wheel *n*, which gears with a wheel, *o*, which is fixed upon the axle of the roller *f*, these wheels being beveled to suit the inclination of the axes of the said rollers. The shaft *k* is actuated by any ordinary or suitable means to impart the requisite "taking-up" movements to the rollers *d* and *f*. The last-named rollers are or may be covered with sand or emery, or be otherwise roughened; but the intermediate roller may be smooth. The woven material passes between the rollers in the direction indicated by the dotted line *p*, Fig. 5, being nipped between the taking-up rollers and the intermediate roller, whereby a regular taking-up action is insured. It will be readily understood that owing to the conical formation of the rollers the cloth is taken up to an increasing extent from one selvage to the other, whereby the web is produced in a curved form, as indicated in Fig. 1. To enable the cloth to be so taken up, it is necessary to let off the warp in differing degrees. Theoretically each warp end should be separately let off from a bobbin; but an approximate result is obtained by dividing the warp into eight different portions,

or into any other suitable number of portions, each portion being wound on a separate bobbin or beam.

Fig. 6 is a view, similar to Fig. 4, of a taking-up motion, wherein two conical rollers, *q* and *r*, are used, instead of the three rollers hereinbefore described. The roller *q* is driven from the shaft *k* from the spur-wheel *l*, which gears with the spur-wheel *m* on the axle of the roller *q*. At the opposite end of the axle of the roller *q* is a spur-wheel, *s*, which gears with another similar wheel, *t*, on the axle of the roller *r*. The two rollers therefore are geared to revolve together, and by making the roller *r* slightly larger than the roller *q*, or by making the gear-wheel *t* slightly smaller than the wheel *s*, the roller *r* can be rotated with a greater circumferential speed than the roller *q*, so as to draw the web forward and keep it stretched upon the roller *q*. In order to maintain the requisite nipping-pressure between the rollers, the roller *q* is carried in adjustable bearings *u* in the bracket *g*, as seen at Fig. 7, which can be pressed down by the screws *v*, so as to press the rollers closely together. The surface of one or of both of the rollers may be roughened, so as to increase the frictional contact.

I claim as my invention—

1. The herein-described curved waistband, consisting of an outer web and an inner lining secured to each other, and each having one selvage longer than the other, and its wefts extending across the band radially.

2. The herein-described curved waistband, consisting of an outer web and an inner lining secured to each other at one edge, and by binding-picks within the edge, each web having one selvage longer than the other and its wefts running across the band radially.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CARL VORWERK.

Witnesses:

ERNST THÜNGEN,  
GEO. KOCH.