June 30, 1925. 1,544,312

M. L. GRAY

ELASTIC BORDER BAND AND RUFFLE AND METHOD OF PRODUCING SAME

Filed Feb. 21, 1923 3 Sheets-Sheet 1

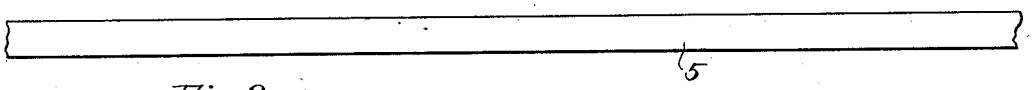


Fig. 2.

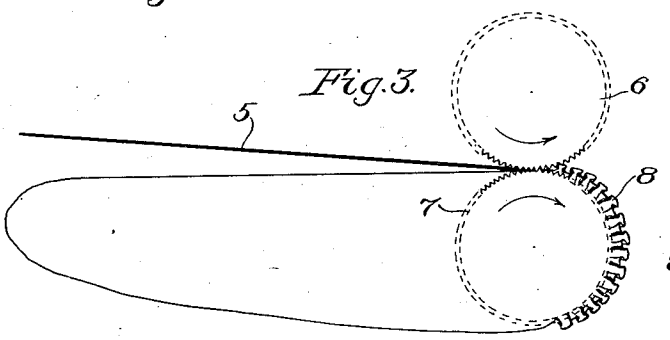


Fig. 3.

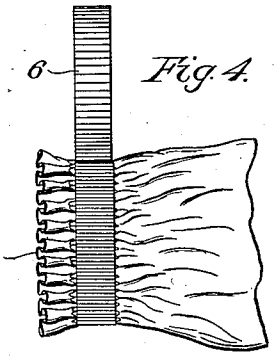


Fig. 4.

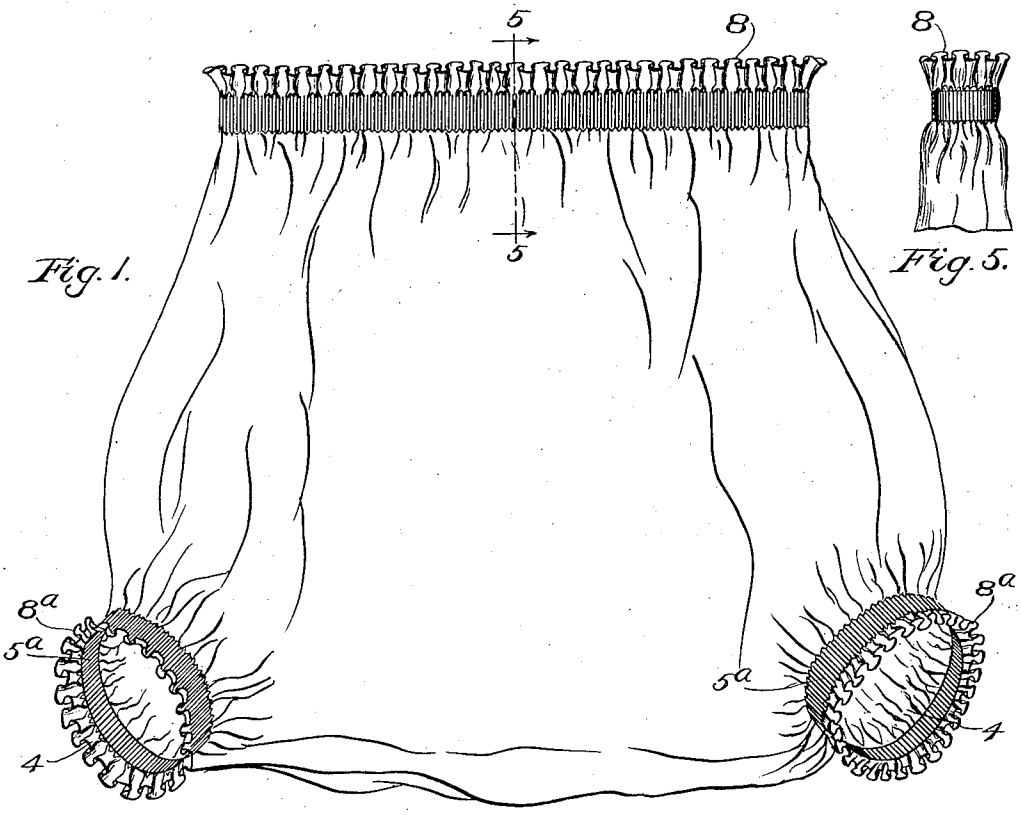


Fig. 1.

Fig. 5.

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ELASTIC BORDER BAND AND RUFFLE AND METHOD OF PRODUCING SAME

Filed Feb. 21, 1923 3 Sheets-Sheet 2

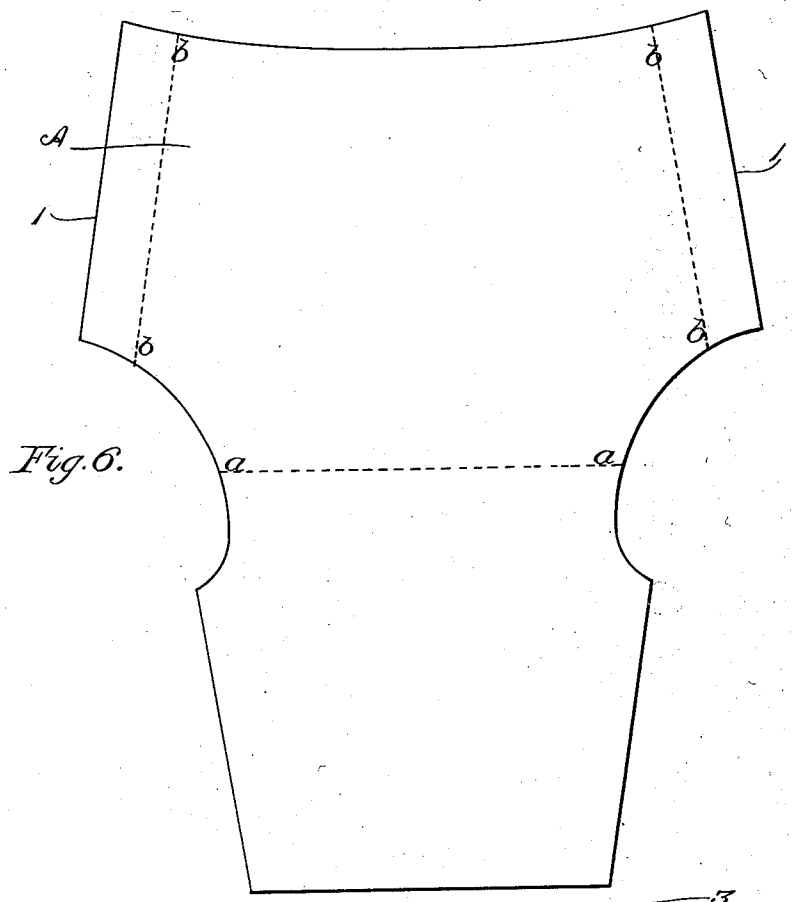


Fig. 6.

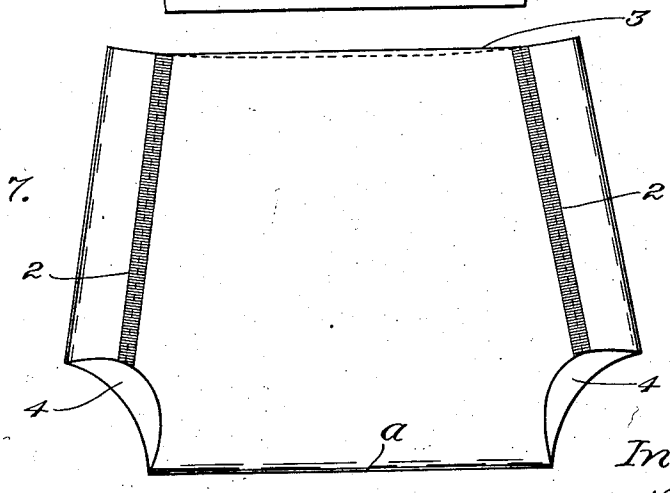


Fig. 7.

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ELASTIC BORDER BAND AND RUFFLE AND METHOD OF PRODUCING SAME

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Fig. 8.

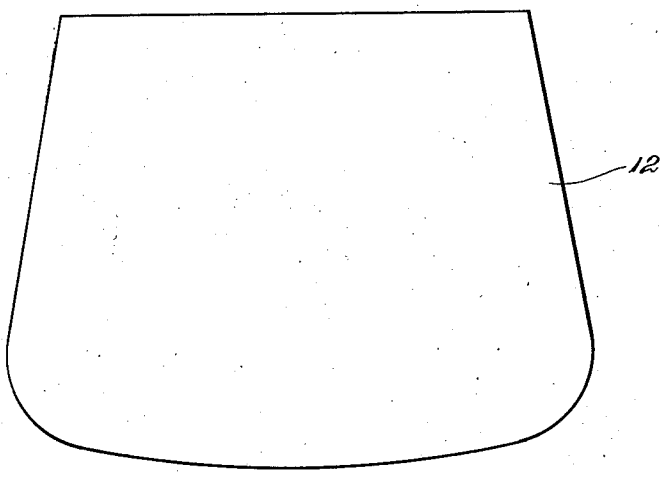


Fig. 9.

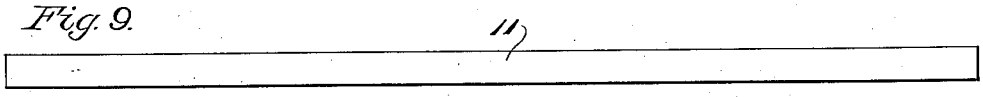


Fig. 10.

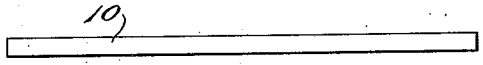


Fig. 11.

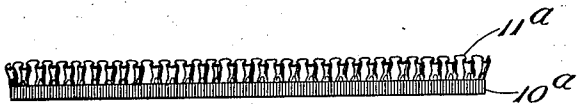
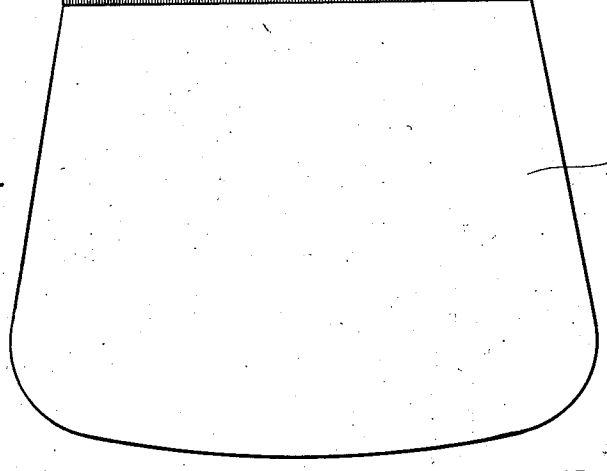




Fig. 12.



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Patented June 30, 1925. 1,544,312

UNITED STATES PATENT OFFICE.

MATTHEW L. GRAY, OF CANTON, MASSACHUSETTS, ASSIGNOR TO PLYMOUTH RUBBER COMPANY, INC., OF CANTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

ELASTIC BORDER BAND AND RUFFLE AND METHOD OF PRODUCING SAME.

Application filed February 21, 1923. Serial No. 620,494.

To all whom it may concern:

Be it known that I, MATTHEW L. GRAY, a citizen of the United States, residing at Canton, county of Norfolk, State of Massachusetts, have invented a certain new and useful Improvement in Elastic Border Bands and Ruffles and Methods of Producing Same, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to a new and useful improvement in combined elastic border band and ruffle for garments or other articles, and method of producing the same. The invention has especial reference to india rubber garments, in which it is desired to provide an elastic binding for the several openings for the legs, arms, wrist or waist; also to such articles, for instance, as aprons, in which it is desired to provide the article with a ruffle on the lower edge.

In the manufacture of babies' rubber pants, for instance, it is important to have the waist and leg openings fit snugly when the garment is on the child, and to have an elastic band or binding around the opening, so that the garment can easily be put on and off, yet have a snug fit when it is on without the use of strings or other fastenings.

As heretofore made, such garments have been formed with an inelastic band around the waist, or around the cuff of the leg opening, in such manner as to leave a runway for an elastic cord, then the rubber is cured, then after the curing an elastic cord is inserted in this opening and the ends of the cord fastened together under tension, so that the contraction of the cord after the ends are fastened together will pucker up the cuff or waist opening. Sometimes the sewed ends of the cord break apart, or the cord breaks in the middle, or it loses its elasticity. In such cases in the careless handling of the garment, in putting on or off, if the two opposite sides of the opening are pulled in opposite directions, as though to stretch it, the elasticity being already gone, the result will be to tear the garment, as the rubber will tear easily where there is no give to it.

It is also desirable for ornamental purposes to have frilled or ruffled borders around the openings. In the case of aprons or other like articles, it is desirable to have a frilled border.

One object of the present invention is to produce an elastic binder for the several openings of the garment or for the edge of an apron, or other article, which shall be integral with the article itself. Another object of the invention is to so construct the garment, or other article, that in the manufacture of the article the frill will be produced by the contraction of the elastic band during the manufacture.

The invention will be fully understood from the following description when taken in connection with the accompanying drawings, and the novel features thereof will be pointed out and clearly defined in the claims at the close of this specification.

In the drawings, Figures 1 to 7 represent the invention as embodied in a pair of rubber baby pants in the process of making the same.

In the drawings:

Fig. 1 is a perspective view of a garment embodying the invention.

Fig. 2 is a plan view of a strip of uncured rubber, such as used to form an elastic band.

Fig. 3 is an end elevation showing a pair of crimping rolls with the strip and the garment passing through the rolls to crimp the strip, the action of the rolls serving also to cause the strip to adhere to the garment.

Fig. 4 is a side elevation of the parts shown in Fig. 3.

Fig. 5 is a sectional view on the line 5—5 of Fig. 1.

Fig. 6 is a plan view of a sheet of india rubber sheeting cut in the form of a pattern intended for making a pair of rubber pants.

Fig. 7 is a view showing the sheet doubled upon itself and folded at the sides to the form of the garment, before the rubber strip is incorporated in the body portion around the waist and leg openings, the side seams also being closed.

Fig. 8 is a view of a rubber apron to which a ruffle is to be applied.

Fig. 9 is a view of a strip of uncured rubber which is to form a part of the ruffle.

Fig. 10 is a view of a strip of partially cured rubber of less width and less length than the strip shown in Fig. 9.

Fig. 11 is a view showing the narrower, shorter strip and the wider, longer strip se-

cured together after the shorter strip has been stretched and crimped onto the wider strip.

Fig. 12 shows the ruffled combined strips attached to the border of the apron.

Referring now to the drawings, there is represented at A a piece of rubber sheeting blanked out to the form of a pattern for a single piece garment, embodying the invention, in the form of babies' rubber pants. The rubber sheeting at this stage is in its uncured state. The blank is then folded over transversely, as shown by the dotted line *a*—*a*, and the extended side portions 1—1 of the upper part of the blank are folded over along the lines *b*—*b* to meet the side edges of the narrower, lower portion of the blank which has been folded over, and they are seamed together by strips 2 of uncured rubber. The details of this are not necessary to explain as they do not constitute a part of the present invention.

The garment, as thus far formed, has a waist opening 3 at the top and two leg openings 4—4 at the opposite lower corners. It is now desirable to draw in or contract the waist opening and the two leg openings and to make them elastic, so that all of the openings may readily be stretched open wider to permit the garment to be put onto the child and to contract and close snugly around the waist and legs after the garment is put on. It is also desirable for ornamental purposes to provide a ruffle at the edges of the several openings.

The method of treating each one of the several openings is the same. For convenience of description we shall consider the waist opening. This is done by taking a strip of rubber 5, which has first been partially cured, say for about fifteen minutes, sufficient to give it a degree of resiliency, then stretching it and holding it under tension in engagement with the waist band a little below the edge of the opening and running the combined garment and strip between crimping rolls 6—7, as shown in Figures 3 and 4 while the strip is still under tension. Preferably, the strip 5 is of heavier gauge than the body of the article so as to produce greater tensile strength.

As is well known, the pressure of the crimping rolls on the partially cured strip 5, pressing it against the uncured rubber of the waist band, will cause the strip to strongly adhere to the waist band. As fast as it is passed out through the rolls the tension may be released on that portion and the contraction of the strip 5, when the tension is released, will cause the puckering up or ruffling of the waist band portion of the garment forming the ruffles, as indicated at 8.

It is preferable to have the strip 5 secured to the inner face of the waist band, and for that reason it is more convenient in applying the strip to turn the garment inside out while the said strip is being applied in running it through the crimping rolls. After the strip has been crimped on, the garment can be turned back again right side out.

The garment is still in its uncured state and the strip in its only partially cured state, but sufficiently cured to furnish the necessary elasticity. After the strip has been crimped to the waist band, the two leg openings 4 will be similarly treated, producing the ruffles 8^a and elastic band 5^a.

The whole garment will then be treated to the full curing process and is ready for use.

The strip 5 thus gives to the border of the opening the desired elasticity while the body of the garment is relatively inelastic, and yet the elastic strip is practically integral with the body of the garment.

In applying the invention to an apron to produce a frill on the edge, as illustrated in Figures 8 to 12, a narrow strip 10, say one-half inch wide, of partially cured rubber, is applied to a wider strip 11, say one inch wide, of uncured rubber, so that a portion of the wide strip will be covered by the narrow strip of partially cured rubber and a portion of the uncured strip will be exposed. The partially cured strip is held at this time under tension, and while the partially cured strip is held superimposed upon the uncured strip the two are run through crimping rolls. This causes the partially cured strip to adhere to the uncured strip and will crimp both strips. As fast as it passes through the crimping rolls the contraction of the partially cured strip will frill the wider uncured strip, as shown in Figure 11, forming the ruffles 11^a in the strip 11, the strip 10 being crimped as shown at 10^a.

The portion of the frilled strip, to which the half cured strip is attached, is then applied to the border of an apron 12 and again run through crimping rolls, which will cause the ruffled strip to adhere to the apron which is still in its raw state. The apron with the attached ruffle will then be put through the curing process, which will make the apron and the ruffled member integral for all intents and purposes.

It will be seen that by the process described, the elastic strip, by being partially cured before it is applied to the article which has not been cured at all and then goes through the curing process with the article itself, is subjected to the curing process a longer total period than the article itself. This hardens the strip and gives it greater durability.

In addition to the advantages already set forth in a garment constructed in accordance with the invention, there is a great

saving in material, especially in the material of the strip. Under the old method the strip has to be of the same length as the circumference of the waist band or pant leg opening before the waist band or leg opening is contracted. By my process the strip has to be only of the length of the waist band when it is under tension and its normal length need be only the length required to go around the contracted waist band or pant leg opening, say about one-fourth of the length. There is, therefore, a saving in material of about three-fourths.

There is also the saving of the cost of the elastic cord and the saving of the time required in threading the elastic cord.

As already stated, there is greater strength to the elastic band made in accordance with my invention, because of the danger in the old way of the cord breaking apart where the two ends are sewed together, which is sometimes done carelessly.

What I claim is:—

1. The method of forming a sheet rubber article with an elastic band consisting of applying a strip of partially cured rubber under tension to the rubber body of the article while the said body is in an uncured state and not under tension, applying pressure to the uncured body of the article and the superimposed strip while the strip is under tension to cause the strip and body to adhere together, then relieving the pressure and tension then fully curing the combined body portion and strip.

2. The method of forming an elastic band around an opening in a rubber garment consisting of applying to the rubber body portion around the edge of the opening while the said body is in an uncured state and substantially inelastic and not under tension, a strip of rubber under tension which has already been partially cured sufficiently to render it elastic, pressing together the uncured body and the said strip while the strip is still under tension to cause the strip and uncured body portion to adhere together, then relieving the pressure and tension then fully curing the combined strip and body portion.

3. The method of forming a sheet rubber article with an elastic band consisting of crimping a strip of partially cured rubber while elastic and under tension to the body portion of said article while the rubber body portion of said article is in its uncured state and substantially inelastic and not under tension to cause the strip and article to adhere together, then relieving the pressure and tension then curing the combined body and strip.

4. An article having a body portion of sheet rubber having a ruffled edge and an expansible elastic band of rubber overlying said ruffled edge portion and integral therewith, the band being cured to a greater degree than said ruffled edge of the body portion.

In testimony whereof I affix my signature.

MATTHEW L. GRAY.