

May 29, 1934.

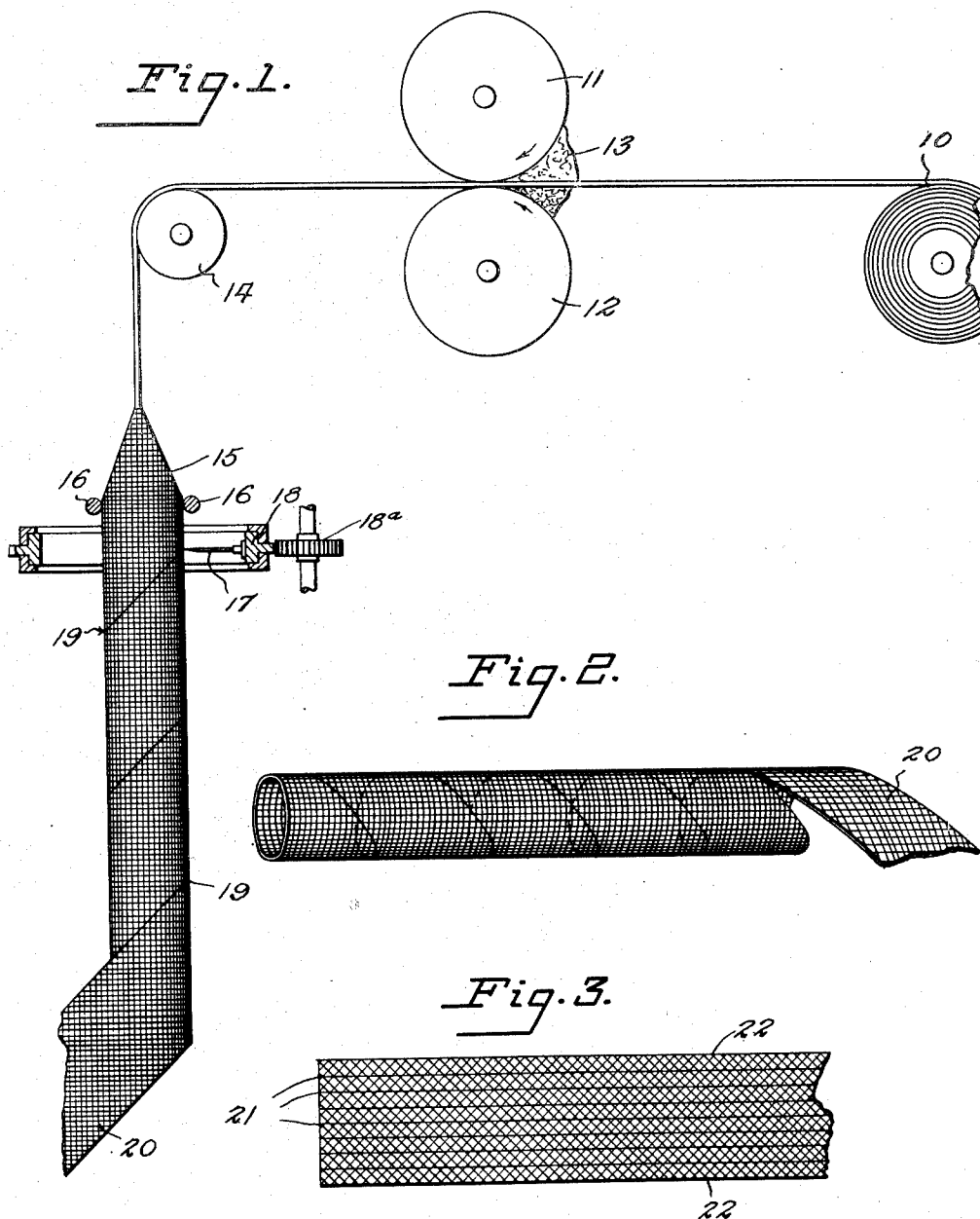
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1,960,997

METHOD AND APPARATUS FOR MAKING WELTS

Filed Jan. 12, 1933

2 Sheets-Sheet 1



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May 29, 1934.

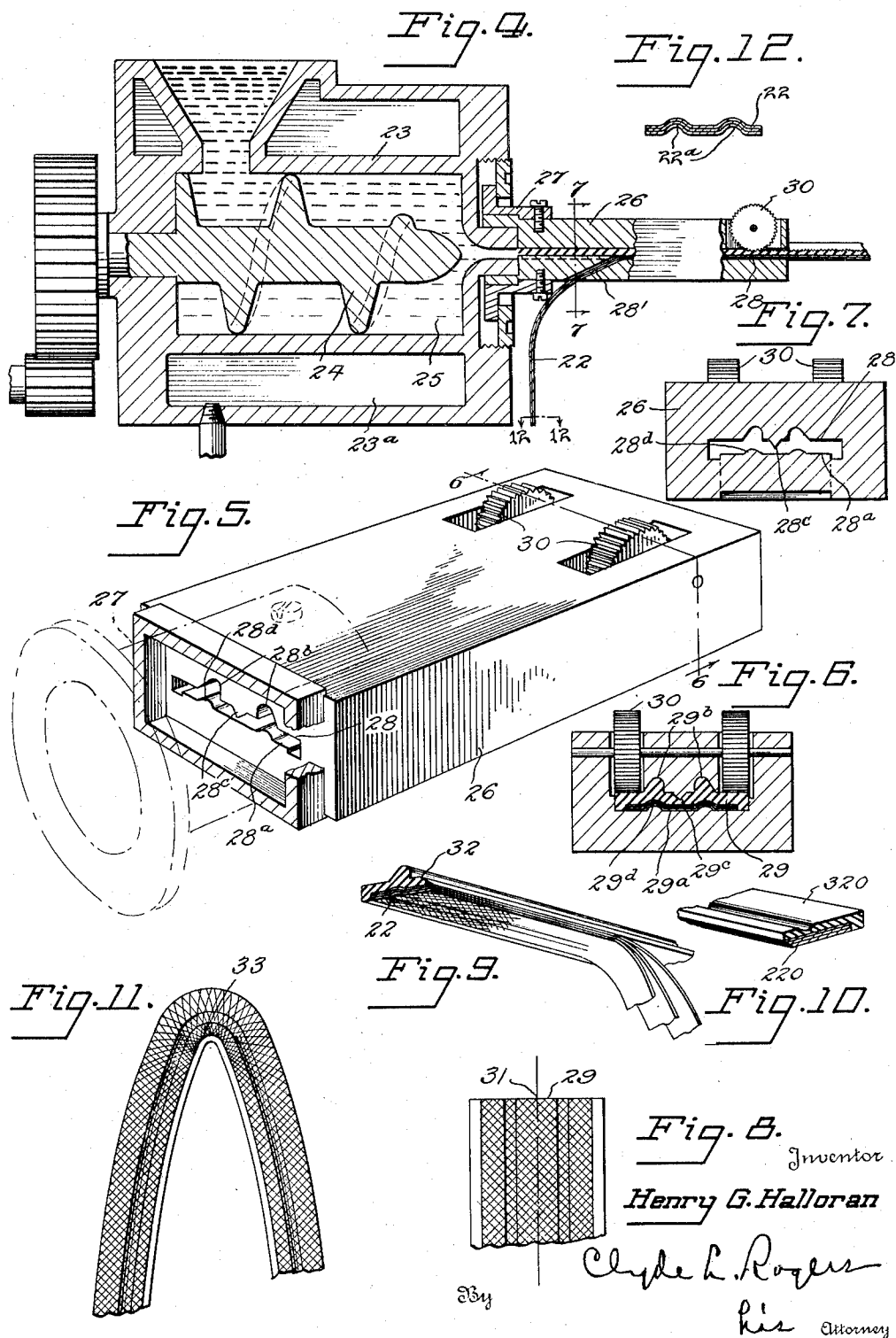
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UNITED STATES PATENT OFFICE

1,960,997

METHOD AND APPARATUS FOR MAKING
WELTS

Henry G. Halloran, Milton, Mass.

Application January 12, 1933, Serial No. 651,393

6 Claims. (Cl. 18—13)

This invention relates to welting adapted to be employed in the welt system of shoe manufacture and for other uses. A principal object of the invention is to provide a welt comprising a strength giving element built up of a series of superposed layers of textile material, preferably united and incorporated with a body of molded plastic such as rubber composition. In accordance with my invention the layers of reinforcing textile material are produced with the threads thereof extending diagonally or on a bias to the length thereof, this being for the purpose of promoting the edgewise flexibility of the material so that it will bend more readily around the contour of the shoe and also so as to prevent raveling out and loose threads along the edge of the material. The invention also has to do with a novel method of producing the improved welting. The foregoing and other objects and advantages of the invention will more fully appear from the following detailed description, and the distinctive features of novelty will be pointed out in the appended claims.

Referring to the drawings:

Fig. 1 is a diagrammatic elevation, partially in section showing a preferred method of producing the bias cut textile strips which constitute the reinforcing element of the welt.

Fig. 2 is a partial perspective showing further the production of the bias strip.

Fig. 3 is a fragmentary elevation showing a further step in the production of the bias strip.

Fig. 4 is a central lengthwise vertical section of a machine adapted for producing the molded welt of the invention.

Fig. 5 is a detailed perspective showing the molding die of the machine on a larger scale.

Fig. 6 is a transverse section on line 6—6 of Fig. 5.

Fig. 7 is a transverse section on line 7—7 of Fig. 4 but on a larger scale.

Fig. 8 is a fragmentary elevation showing a portion of the double strip as produced by the machine of Fig. 4.

Fig. 9 is a fragmentary perspective showing a portion of one form of welt.

Fig. 10 is a similar fragmentary perspective showing another form of welt embodying the invention.

Fig. 11 is a fragmentary elevation illustrating the capability of the textile reinforce to flex around the abrupt curve at the toe of the shoe, and

Fig. 12 is an enlarged sectional detail taken on line 12—12 of Fig. 4.

The textile fabric from which the reinforcing strips are to be formed is produced in a tubular weave 10 of a dimension corresponding to a considerable number of the widthwise dimension used in the welt. This tubular weave may be drawn from a suitable roll through a cement coating station comprising coacting rolls 11, 12, with a mass of the cement coating material 13, indicated in feeding relation so that the cement is applied and pressed into the textile as it passes therethrough. Thence, the material is directed around a guide roll and on to a cylindrical form 15 by which it is expanded to its full dimension. The material may be fed continuously over this form by suitably driven rolls 16 which engage the material frictionally. A knife 17 is mounted on a rotating ring 18 for revolution around the material on the form 15 and engages the material so as to slit it along the spiral 19 as it is moved endwise on the form. The ring 18 for this purpose may be equipped with gear teeth which may be engaged by a driving pinion 18a, the foregoing typifying any suitable means for producing a continuous strip of textile with bias threads. The strip 20 so produced is of a width corresponding to the width of a considerable number, illustratively shown as 8 of the double welt strip portions to be later referred to. A requisite number of these strips 20 are superposed and pressed firmly together so that they are securely united by the cement content thereof. They are then severed along the lines 21 to produce the reinforcing elements 22 of the welt.

It is within the contemplation of the invention to employ these built up welt elements 22 as the complete welt if desired, and for this purpose they may be suitably grooved and beveled to produce the requisite welt cross section, it being noted that such grooving and beveling may be performed without raveling out or loosening of the threads, on account of the described bias cut. In a more comprehensive embodiment of the invention however the textile strips 22 are embedded in, and serve as the reinforcing element of a welt comprising a body of molded plastic, preferably rubber composition; when so used, the strips 22 may be pre-formed with a longitudinal indentation or groove 22a. To produce such a composite welt in continuous lengths various means may be employed but preferably and as herein shown I employ for this purpose an extruding machine indicated generally at 23 and employing a spiral screw feeding member 24 operating in a chamber 25. A suitable extruding die 26 is secured at the discharge end of this machine by means of a

flanged sleeve 27 or the like. This die has a passage 28 therethrough communicating with the discharge passage 25a from the chamber 25. The passage 28 is of a dimension to mold and form a double width of welt as the molded plastic material is forced therethrough. A passage 28' of a dimension to guide a strip 22 of the reinforcing textile of a width sufficient for two welts leads diagonally into the passage 28 at a point a small distance outward from the receiving end thereof. The bottom of the passage 28 back of this passage 28' may be formed with a slightly elevated platform 28a to afford clearance in the molded cross section of the material to receive the textile strip 22 as it is drawn into the passage 28 and embedded in the molded plastic.

Thus the double welt strip indicated at 29 has the textile reinforcing strip 29a closely embedded in, and flush with the bottom of the welt, the textile strip being of a width so that it terminates some little short of the outer sides of the welts, thus leaving a smooth finished edge of molded plastic at the outer side of each welt. The passage 28 is formed with spaced apart grooves 28b extending longitudinally thereof and defining beads 29b extending from the tops of the two welts adjacent the inner sides thereof. The passage 28 is also provided with a V-shaped projection 28c extending into the top thereof and defining a valley at the locality of the severance line of the two welts, this providing beveled edges 29c at the inner sides of the respective welts as is usual. The passage 28 is still further provided with spaced apart beads 28d extending upward from the bottom thereof and defining thread grooves 29d in the bottoms of the welts such as commonly provided.

It may now be understood that in use the textile strip 22 of a double welt width is first threaded through the diagonal passage 28' into the passage 28. The moldable plastic is supplied to the chamber 25 suitably conditioned by heat so that it is capable of being pressed through the die 26 by the action of the screw 24. As the plastic is forced through the passage 28 past the point where the textile strip 22 extends therein to it will draw said strip along with it continuously and at the same time cause the embedding of the strip securely in the plastic as will be readily understood. In case it is desired to produce spaced apart indentations in the outer upper surface of the welt, commonly known as "fudge stitching," this may be accomplished by mounting suitable indenting rolls 30 in position to engage this portion of the welts while they are held against displacement. For this purpose I show said rolls 30 illustratively as mounted in the outer portion of the die 26, though they may be separately mounted. The molded welt stock thus produced is of course soft and more or less unstable as it comes from the machine and it may be subjected to a usual vulcanizing process, the rubber composition or like molded plastic having incorporated therein the usual ingredients adapting it for such treatment. The double welt strip produced as described is severed along the line 31 producing finished welt strips 32 of the character indicated in Fig. 9. The invention also contemplates the production of other forms of welt strips such as a flat strip 320 as seen in Fig. 10, such strip having a textile reinforce 220 of the character already described embedded therein and being suitably grooved and beveled according to usual practice.

I attach special importance to the bias cut of the textile reinforce in that it greatly facilitates

the bending of the welt in sharp curves around pointed toes and the like as indicated at 33, the bias cut threads permitting a relative yield and spread allowing such edgewise bending to a degree that would be quite impossible with a textile having threads running straight lengthwise. The bias cut is therefore valuable and important both in permitting edgewise flexing of the welt and in preventing unraveling and fraying of the textile threads. By the described process I am enabled to produce welt strips in endless lengths, the described system of producing the bias cut textile permitting indefinite lengths thereof, and the extruding machine of course being capable of producing the molded strip continuously so long as molded plastic is supplied thereto.

As heretofore stated, the welt of the invention may be embodied in different forms, of which those shown in Figs. 9 and 10 are merely illustrative. I consider the form shown in Fig. 9 to be particularly desirable, since it not only presents a smooth finish exterior of molded plastic, with the textile reinforce entirely concealed when in the shoe, but the bead 29b presents a pleasing and finished effect as it lies closely in the juncture of the welt and upper. I am aware that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and I therefore desire the present embodiment to be considered in all respects as illustrative and not restrictive, reference being had to the appended claims rather than to the foregoing description to indicate the scope of the invention.

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

1. The herein described process which consists in premoulding a textile reinforcing strip with a thread groove, feeding said strip through a die adapted to produce the required welt cross section, continuously forcing moldable plastic through said die to cause the reinforcing strip to be embedded therein, and supporting such strip at the locality of the thread groove therein in a manner to preserve such groove and to produce a welt of the required cross section.

2. The herein described method which consists of pre-molding a textile reinforcing strip with a thread groove, uniting moldable plastic with said strip under pressure to produce a welt of the required cross section, and supporting the strip at the locality of the thread groove in a manner to preserve such groove against the action of such pressure.

3. The herein described method which comprises forcing moldable plastic through a die to produce the cross section required for a welt but with a rebated portion adapted to receive a reinforcing strip with a pre-formed thread groove, and feeding a textile reinforcing strip pre-molded with a thread groove into such die and into the rebated portion of the plastic to unite with such plastic under pressure.

4. Welt making apparatus comprising an extruding die, and means for supplying moldable plastic thereto under pressure, said die having provision for guiding a reinforcing strip into an intermediate portion thereof, the passage in said die back of said reinforcing strip defining the cross section required for a welt with a rebated portion to receive such reinforcing strip.

5. Welt making apparatus comprising an extruding die, and means for supplying moldable plastic thereto under pressure, said die having provision for guiding a reinforcing strip into an

intermediate portion thereof, the passage in said die back of said reinforcing strip defining the cross section required for a welt with a rebated portion to receive such reinforcing strip, and the die in its forward portion having provision for supporting the strip so as to preserve a thread groove therein. 80

6. The method of making welts which comprises preforming with a thread groove a continu-

ous bias cut textile reinforcing strip of less width than that of the welt to be produced, continuously forcing moldable plastic through a die adapted to produce a welt having a thread groove, and feeding such strip through the die in a manner to cause the same to be embedded in the base of the welt produced without altering its thread groove.

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