

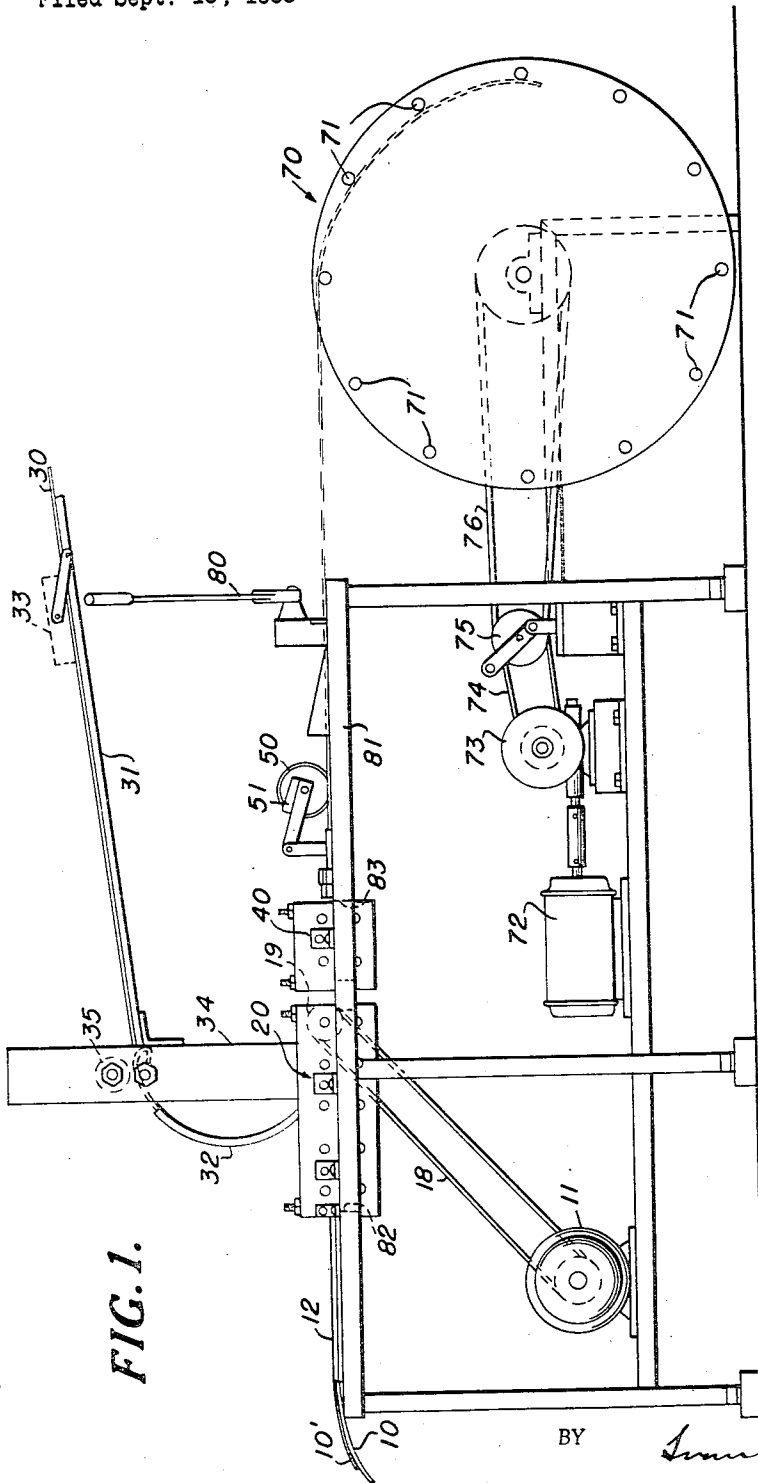
Jan. 15, 1957

M. GOLDSMITH
COILED PRODUCT

2,777,573

Filed Sept. 13, 1955

2 Sheets-Sheet 1



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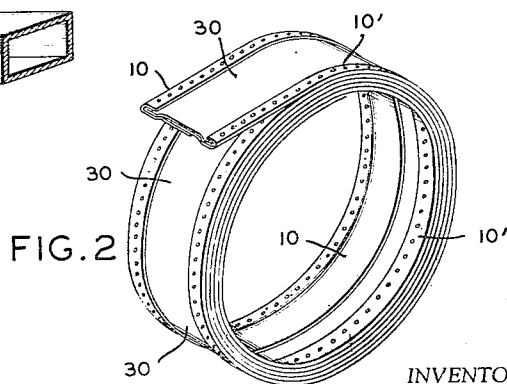
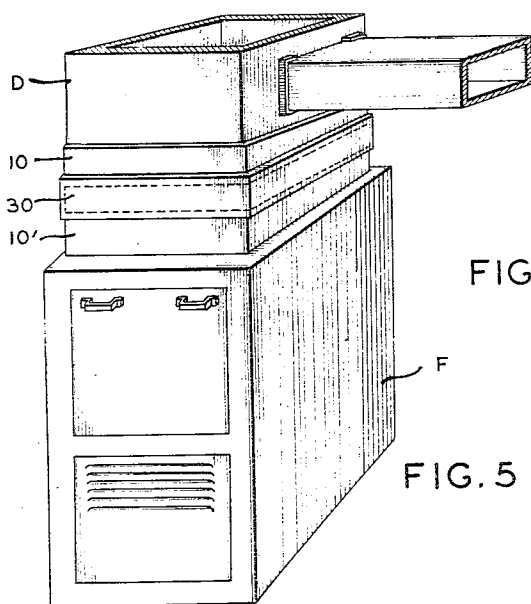
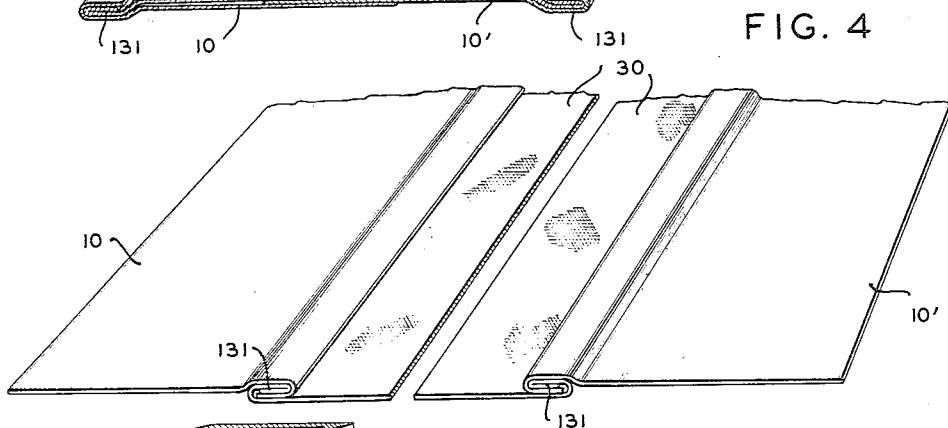
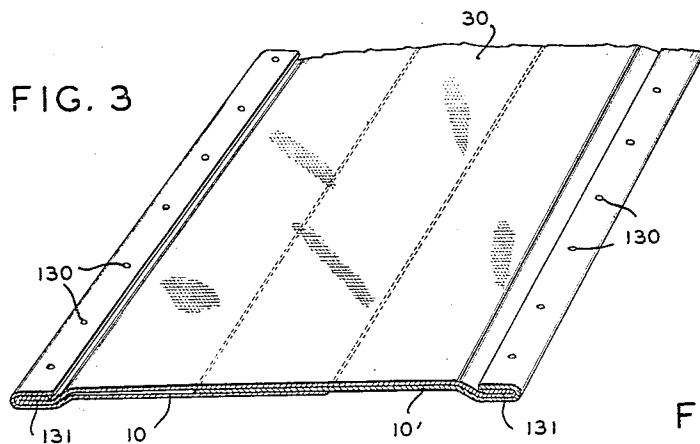
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2,777,573

COILED PRODUCT

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Original application January 4, 1954, Serial No. 402,096. Divided and this application September 13, 1955, Serial No. 537,203

2 Claims. (Cl. 206—59)

The present application is a division of application Serial No. 402,096 filed January 4, 1954.

The present invention relates to the production of a coil of material, the material comprising two elongated strips of metal, an edge portion of each of which are folded into secure engagement with the opposite side edges of a single elongated strip of fabric.

The invention more particularly is directed to a coil of a length of folded flexible connector stock material in which the length of stock material which is coiled comprises two elongated metal strips and an elongated strip of fabric secured therebetween. Each of the metal strips has one of its side marginal portions fixedly secured along the length thereof to an opposite side marginal portion of the elongated strip of fabric. This securement is achieved by bending the marginal portions of the metal strips into clamping engagement with the marginal portions of the strip of fabric. The other side marginal portions of the metal strips overlap. These secured together strips which form the length of stock material are coiled to form a coil in which the metal strips overlap each other and the strip of fabric circumferentially in the coil. The securement of the metal strips to the fabric strip to form the length of stock material is effected at the same time that this stock material is coiled. Accordingly, the strip of fabric is unwrinkled throughout its length in the coil.

Other and further objects of the invention will become apparent from the following description of the invention taken in conjunction with the accompanying drawings in which:

Figure 1 is a side elevational view illustrating the production of a coil in accordance with the invention.

Figure 2 is a perspective view showing the coil produced in Figure 1;

Figure 3 is a fragmentary perspective view of the stock material after the same has been formed and immediately prior to coiling;

Figure 4 is a fragmentary perspective view of the stock material after a section of the same has been withdrawn from the coil and severed therefrom and the metal strips unfolded preparatory to use; and

Figure 5 is a fragmentary perspective view of the product in use forming a flexible connection between a furnace and the ductwork used to convey the heated air away from the furnace.

Referring to Figure 1 of the drawing, two strips of metal 10, 10' are continuously withdrawn from a supply coil (not shown) and pulled into and through two juxtaposed laterally spaced parallel series of forming rolls indicated generally at 20. The metal strips 10 and 10' are pulled into the forming rolls 20 through a metal guide 12. The forming rolls are driven by means of motor 11, belt 18 and pulley 19. A strip of fabric 30 is fed from a supply (not shown) and slid along an overhead chute 31 to a fabric guide 32 supported by up-rights 34. A weight 33, secured to the chute 31, as shown, is placed upon the fabric 30 and serves, together

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with the friction of the fabric against the chute itself, to provide suitable tension to the fabric supplied. The fabric 30 passes under idler roll 35 which presses the fabric 30 against the surface of the fabric guide 32, thus additionally reducing the danger of having the fabric wrinkle.

The two strips of metal 10, 10', together with the superimposed fabric 30 emerge from the forming rolls 20 and are permanently secured together by pressure crimping rolls indicated generally at 40. The resulting product advances beneath roller 50, contact of the product serving to rotate roller 50 to actuate a counting device 51 to indicate the length of product produced by operation of the machine.

The product as continuously produced is fastened to a coiling reel indicated generally at 70 by leading the secured superimposed strips of metal and fabric over one of the bars 71 and under the next succeeding bar to thereby hold the advancing product by virtue of the natural resiliency of the metal strips.

The coiling reel 70 is driven by motor 72, power from the motor being transferred to the coiling reel by means of a reduction gear 73, belt 74, variable speed reducing device 75 and belt 76. The belt 76 is connected to a section of the variable speed reducing device 75 having a diameter of proper size to cause the bars 71 on the coiling reel 70 to advance at the same, or slightly greater, linear velocity than the product which emerges from the machine. If a slightly greater velocity is employed, slippage of belts 74 and 76 would occur and provide a constant torque to coiling reel 70 which reduces the tendency of the metal strip 10 and 10' to slip.

After the desired length of product has been produced and coiled on coiling reel 70, the product is severed by cutting device 80, and slid off the bars 71 on the coiling reel 70 and packaged as a coil.

In operation, the motor 11 drives the forming rolls 20 at a rate sufficient to produce 20 feet of product per minute. Accordingly, motor 72 is operated at 1,750 R. P. M., a reduction gear ratio of 80 to 1 is employed and the variable speed reducing device is set to produce a 3 to 1 reduction in belt velocity to thereby provide bars 71, which move in a circle of 30 inch diameter, with a velocity which coincides with the rate of travel of the material produced.

Motors 11 and 72 are preferably supplied with electric current from a common circuit so that both may be actuated and stopped simultaneously with a common switch. If desired, the counting device 51 may be connected with an electrical relay which breaks the electric circuit to the motors 11 and 72 so that the machine may be automatically stopped when the desired length of product has been produced.

As is evident from Figure 1, the juxtaposed laterally spaced parallel series of forming rolls 20, pressure crimping rolls 40, counting device 51 and cutting device 80 are all mounted upon table 81. The table 81, as can be seen in Figure 1 has apertures 82 and 83 to receive the forming rolls 20 and the pressure crimping rolls 40, respectively.

A more complete description of the manner in which the length of flexible connector stock material is continuously produced will be found in my previously referred to application Serial No. 402,096.

The secured together stock material in coil form is illustrated in Figure 2 and the stock material which is coiled is clearly shown in Figure 3. As will be apparent, the two strips of metal 10 and 10' overlap each other in the stock material of Figure 3 and in the coil of Figure 2. The fabric 30 is preferably provided with a sewn marginal bead 130 and the clamping securement of the metal strips 10 and 10' to the fabric 30 is preferably enhanced by

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crimping the portions of the metal strips which are bent over upon the fabric at a plurality of spaced points along the length thereof, the points of crimping being designated 131. In use, a suitable length of the product is severed from a coil of the same and opened into the form shown in Figure 4. The metal strips are then bent into the shape of the ducts to which they are to be attached and secured thereto in any suitable manner.

A typical utilization of the product is illustrated in Figure 5 where it forms a flexible connection between a furnace F and the ductwork D which leads the heated air produced by the furnace to wherever the heated air is desired. The flexible connection prevents transmission of vibration from the blower in the furnace to the ductwork and, accordingly, acts to substantially reduce noise. Further, use of the flexible connection eases the problem of exactly fitting the ductwork to the furnace, since any error is compensated for by the flexibility of the fabric 30.

The term "fabric" as employed herein is intended to include any flexible, yieldable sheet material, as for example, canvas, woven asbestos webbing or listing tape, sheets of rubber and synthetic resinous materials such as "neoprene" vinyl polymers and copolymers and woven and unwoven fabrics coated with rubber or synthetic resinous materials. Some of these flexible yieldable sheet materials cannot be satisfactorily sewn, in which case, a thickened margin may be employed in place of a sewn marginal bead.

I claim:

1. A coil of a length of folded flexible connector stock 30

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material, said length comprising two elongated metal strips and an elongated strip of fabric secured therebetween, each of said metal strips having one of its side marginal portions fixedly secured along the length thereof to an opposite side marginal portion of said elongated strip of fabric by bending the marginal portions of said metal strips into clamping engagement with the marginal portions of said strip of fabric, the other side marginal portions of the metal strips being in overlapping relation, said secured together strips forming said length being coiled to form said coil wherein the marginal portions of said metal strips remote from said secured marginal portions overlap each other and the strip of fabric circumferentially in said coil, and the said strip of fabric being substantially unwrinkled throughout its length in said coil.

2. A coil as recited in claim 1 in which the bent portions of said metal strips are crimped at a plurality of spaced points along the length thereof and said coil has an internal diameter of about 30 inches.

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