March 19, 1963 R. J. KOVATCH 3,081,495

PRINTING ROLL

Filed Dec. 16, 1959

Fig. 1

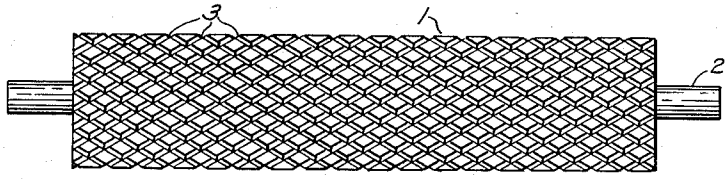


Fig. 2

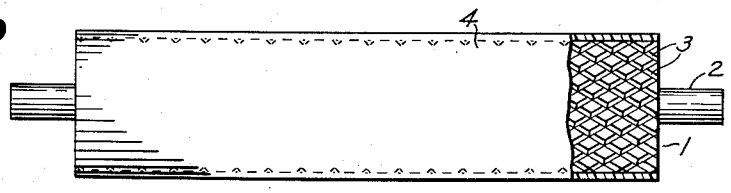


Fig. 3

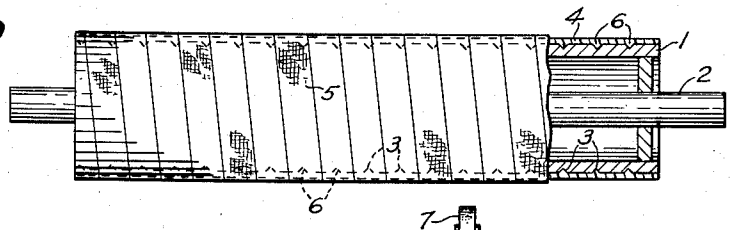


Fig. 4

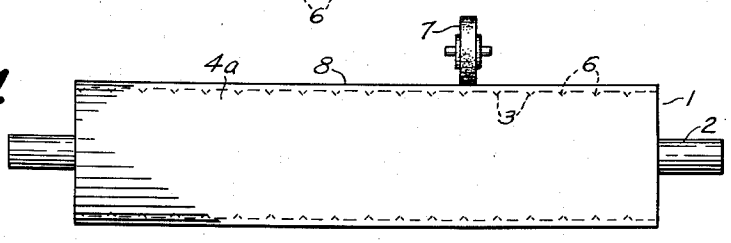


Fig. 5

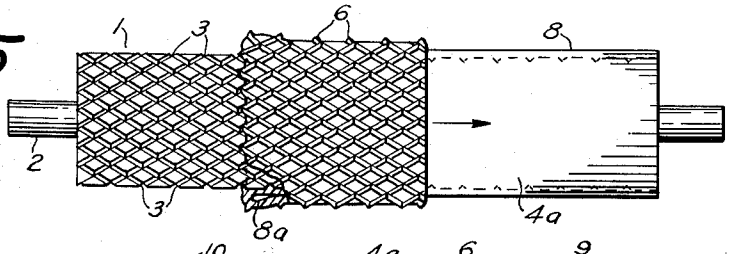
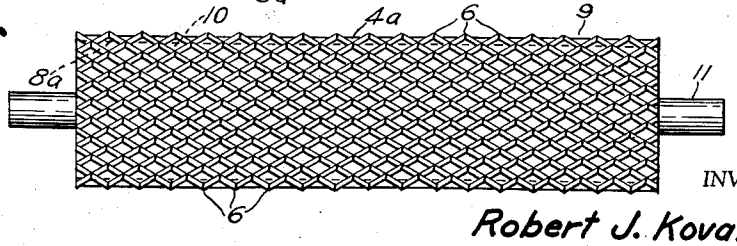


Fig. 6



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PRINTING ROLL

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4 Claims. (Cl. 18—47.5)

This invention relates to printing rolls and more particularly to an improved method of making a tubular printing roll sleeve of neoprene or the like material.

Differentially coated sheets or strip, that is, sheets or strip having a heavier coating on one side than on the other, usually are marked prior to shipment with an identifying symbol which designates the light or heavy plated side of such sheets. In the case of electrolytic tin plate, it is desirable to imprint a continuous unbroken marking on one side of the sheet or strip for the purpose of easily recognizing either side during later fabrication or use of the sheets by the customer.

Previous methods of printing on metal sheets have not produced as satisfactory a marking as was required. As an example of one method, several sheets of brass-backed rubber matting with the desired pattern outstanding on the surface of the mat were attached to the external surface of the steel roll with flat-head machine screws. This method had faults as the match line broke the continuous pattern. Also, complete adhesion of the brass-backed matting to the steel roll by means of machine screws was not obtainable. The brass backing buckled continually causing an uneven roll surface which could not be corrected by grinding.

My method is an improvement in making these rolls since the faults mentioned are eliminated.

In this invention I have illustrated a roll for the printing of diamond-shaped marks although other patterns could also be used.

It is therefore an object of this invention to provide a printing roll which will imprint a continuous unbroken pattern on processed sheet or strip.

Another object of this invention is to provide a printing roll sleeve which will adhere tightly to the roll and not buckle at high speeds.

A further object is to make a printing roll with a seamless rubber sleeve which will print and wear more evenly.

A still further object is to provide a printing roll of improved marking qualities.

These and further objects will be apparent from the following description, reference being had to the accompanying drawing in which:

FIG. 1 is a view of the die sleeve roll with the negative imprint grooves machined into the roll.

FIG. 2 is a view showing a sheet of soft or uncured neoprene wrapped around said roll.

FIG. 3 shown partially in section, is a view of the roll with canvas belting wrapped around the neoprene.

FIG. 4 illustrates the grinding operation after vulcanizing of the sleeve and removal of the canvas belting.

FIG. 5 is a view showing the neoprene sleeve being stripped from the roll and being turned inside out at the same time.

FIG. 6 shows the die sleeve secured to a roll which is used as the printing roll.

Referring now in more detail to the drawing, there is illustrated a die sleeve roll **1** which is supported by a shaft **2** during machining of the grooves **3** that will serve as a matrix for the finished neoprene die sleeve. A sheet of soft unvulcanized neoprene **4** is now wrapped around the roll resulting in a sleeve which is slightly larger in diameter than the die sleeve roll **1**. Next, canvas belting **5** is tightly wound around the neoprene sleeve as illustrated in FIG. 3. This forces the soft

unvulcanized neoprene into the machined grooves **3** of the die sleeve roll. This assembly is then vulcanized for the required time which forms a molded sleeve **4***a* having the desired pattern markings **6**. After vulcanizing of the sleeve, the canvas belting is removed and the sleeve is ground by grinding apparatus **7** to a uniform wall thickness. The smooth outer surface **8** thus formed becomes the inner surface **8***a* on the assembled printing roll **9**. When the neoprene sleeve **4***a* is stripped from the die roll **1**, it is done manually and at the same time turned inside out as shown in FIG. 5. Finally, the neoprene die sleeve is stretched onto a smooth-surfaced roll **10**, that has a supporting shaft **11**, and is adhesively secured and vulcanized to this roll. The sleeve **4***a* is now lightly ground to true up the printing edges **6** of the printing roll assembly **9**.

The printing roll formed as described, is positioned at the appropriate point in a continuous plating line to provide continuous identification of the heavier or lighter side of the coated metal sheet or strip.

I claim:

1. A method of making a printing roll, comprising the steps of forming negative imprint grooves on a metal roll, covering outer surface of said roll with neoprene or the like material, wrapping a fabric-like material tightly around said neoprene sleeve to force the neoprene into said grooves of the metal roll and form a molded pattern on the inner surface of said sleeve, vulcanizing the neoprene sleeve, removing the fabric-like material, grinding the molded sleeve to a uniform wall thickness, stripping said sleeve off the roll so that the molded pattern becomes the outer surface of the sleeve, and securing the patterned printing sleeve onto a smooth roll by vulcanizing.

2. A method of making a printing roll, comprising the steps of forming imprint grooves on a metal roll, covering the outer cylindrical surface with a layer of neoprene or like material, winding a fabric-like material around the neoprene layer and forcing the neoprene into the grooves, vulcanizing the neoprene sleeve, removing the fabric-like material, grinding the molded sleeve to a uniform wall thickness, stripping said sleeve and simultaneously turning the sleeve inside out so that the grooved printing pattern becomes the outside surface of the printing sleeve, applying an adhesive to the inner surface of the molded sleeve and placing said sleeve over a smooth roll, vulcanizing the sleeve to the smooth roll, and lightly grinding the printing surface of the vulcanized sleeve.

3. A method of making a printing die roll, comprising the steps of making a cylindrical metal die roll with a smooth external surface, forming negative imprint grooves of the desired pattern in said external surface, covering said surface with a sleeve of uncured neoprene or the like, wrapping said sleeve with fabric under sufficient tension to force the uncured neoprene into the grooves, vulcanizing the neoprene sleeve, removing the fabric from the sleeve, grinding the sleeve wall to a uniform thickness, removing the sleeve from the metal die roll and simultaneously turning the sleeve inside out so that the raised printing face becomes the sleeve's external surface, applying a binding cement to the internal surface of the sleeve and to the external surface of a second smooth cylindrical metal roll, securing said sleeve onto the latter metal roll, and lightly grinding the raised printing pattern of the molded sleeve.

4. A method of making a printing roll, comprising the steps of forming a negative imprint on a metal roll, covering the outer surface of said roll with a sleeve of neoprene or the like material, wrapping a fabric-like material tightly around said neoprene sleeve to force the neoprene into intimate contact with said negative imprint and form a molded pattern on the inner surface

of said sleeve, vulcanizing the neoprene sleeve, grinding the outer surface of the molded sleeve to obtain a substantially uniform wall thickness of said sleeve, stripping said sleeve off the roll so that the ground outer surface becomes the inner surface of said sleeve and the molded pattern becomes the outer surface of the sleeve, and securing the sleeve on a smooth roll by vulcanizing the ground surface to the said smooth roll.

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