Jan. 20, 1959 E. T. LORIG 2,869,866

SELF-CENTERING ROLL

Filed Dec. 27, 1955

FIG. 1.

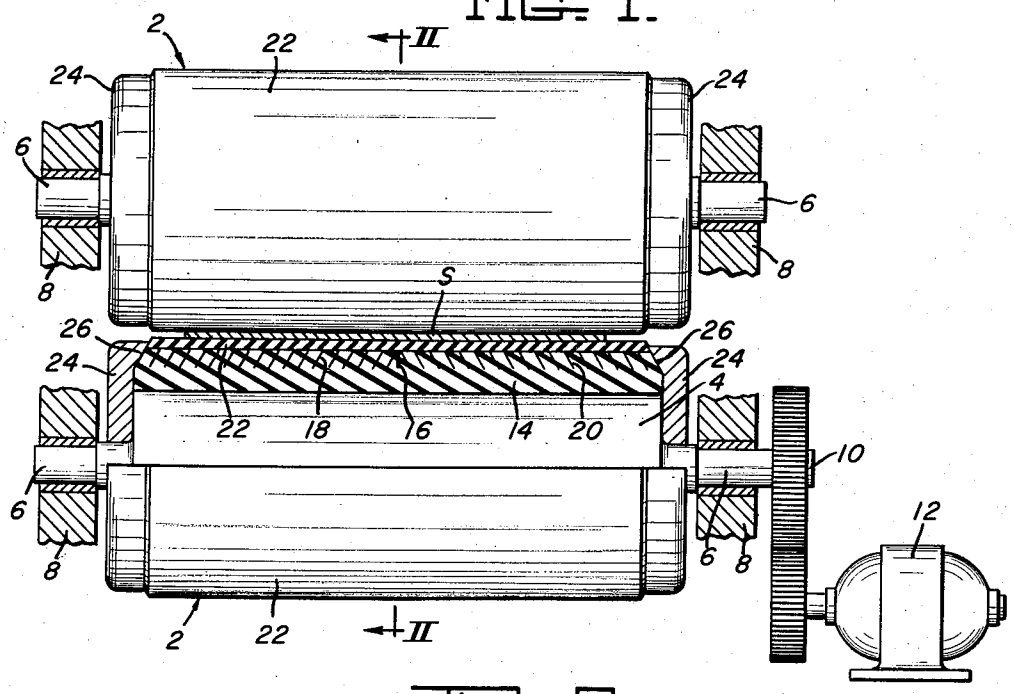
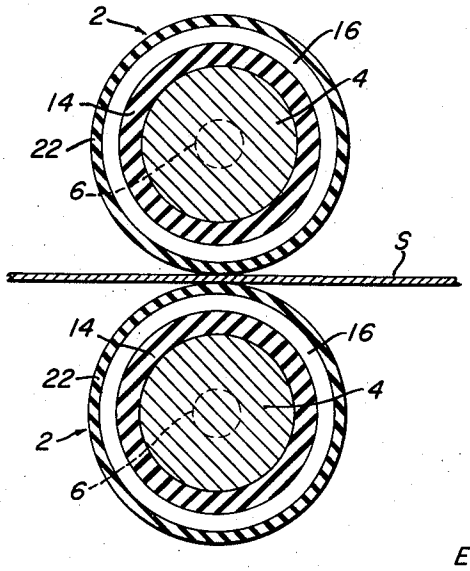


FIG. 2.



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2,869,866

SELF-CENTERING ROLL

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3 Claims. (Cl. 271—2.6)

This invention relates to a self-centering roll and more particularly to such a roll having a smooth outer surface made of flexible material. When strip material passes over ordinary rolls, the strip instead of remaining centered on the roll tends to reciprocate from side to side. Various types of rolls have been developed to prevent or limit such reciprocation. One type of roll for this purpose is shown in my prior Patent No. 2,592,581, dated April 15, 1952. In the roll shown therein slots are arranged on the periphery of the roll and when used with highly polished material, especially strip with soft coatings thereon, there is danger that the surface of the material will be slightly marked by the slots in the roll surface.

It is therefore an object of my invention to provide a self-centering and aligning roll having a continuous or smooth outer surface.

Another object is to provide such a roll which is particularly suited for operation as a pinch roll.

These and other objects will be more apparent after referring to the following specification and attached drawings, in which:

Figure 1 is a view, partly in section, showing the roll of my invention as used in a pinch roll arrangement; and

Figure 2 is a view taken on the line II—II of Figure 1.

Referring more particularly to the drawings, reference numeral **2** indicates the self-centering and aligning roll of my invention. Each of the rolls **2** has a metallic core **4** supported by shaft portions **6**. The shaft portions **6** are supported in spaced bearings **8**. When used in a pinch roll arrangement as shown, one of the rolls is preferably provided with a shaft extension **10** which is connected to be driven from a motor **12**. A covering **14** of rubber or the like is secured to the core **4**. The generally cylindrical outer surface of the covering **14** is provided with a radial slot **16** in a transverse central plane and slots **18** and **20** on each side thereof extending inwardly toward the roll axis away from the transverse central slot **16**. The slots **16**, **18** and **20** may be of substantial width as shown in my aforementioned patent or may be simply formed by slitting the rubber as shown in my copending application, Serial No. 380,646, filed September 17, 1953, now Patent No. 2,772,879, dated December 4, 1956. The core **4** and covering **14** form a body portion. Surrounding the covering **14** in close engagement therewith is a thin flexible cylindrical sleeve **22**. The sleeve **22** is preferably about one-quarter inch thick and of softer material than the material of covering **14**. The sleeve **22** may

be made of any low modulus material such as rubber, leather, cloth, fabric, or the like which can move readily under load. A confining web **24** having a diameter slightly less than the diameter of sleeve **22** is attached to the core **4** at each end thereof. The outer portions of webs **24** are preferably arranged at an angle **26** extending outwardly and inwardly toward the transverse center of the roll, as shown. In the pinch roll arrangement shown one of the rolls may be an ordinary rubber covered cylindrical roll. If strip S passing between the rolls **2** has liquid on its surface, any excess thereof will be squeezed therefrom by the rolls. As the strip S passes between a pair of rolls or over a single roll **2**, forces are exerted thereon tending to keep the strip centered and aligned. Wear of the roll all takes place on the sleeve **22** and when the sleeve **22** wears to such an extent that the roll will not operate satisfactorily it is only necessary to replace it by a new sleeve **22**. Thus, it is only necessary to keep relatively cheap sleeves rather than expensive rolls in stock.

While one embodiment of my invention has been shown and described it will be apparent that other adaptations and modifications may be made without departing from the scope of the following claims.

I claim:

1. A roll for automatically centering and aligning a moving object comprising a generally cylindrical body portion having a plurality of flexible projections on its outer periphery arranged on both sides of a transverse central plane, said projections being inclined radially toward the axis of the roll away from the said transverse central plane, and a thin flexible generally imperforate sleeve surrounding said body portion in close engagement therewith.

2. A roll for automatically centering and aligning a moving object comprising a generally cylindrical body portion, said body portion including a generally cylindrical rubber covering mounted on a metallic core, said rubber covering having a radial slit in its outer periphery in a transverse central plane and a plurality of inclined slits on each side of said radial slit, said inclined slits extending toward the axis of the roll away from the said transverse central plane, a thin flexible sleeve surrounding said body portion in close engagement therewith, and a web attached to each end of the core in close engagement with the rubber covering and flexible sleeve, said webs having a diameter slightly less than the outside diameter of said flexible sleeve.

3. A roll for automatically centering and aligning a moving object comprising a generally cylindrical body portion, said body portion having a radial slit in its outer periphery in a transverse central plane and a plurality of inclined slits on each side of said radial slit, said inclined slits extending toward the axis of the roll away from the said transverse central plane, and a thin flexible sleeve surrounding said body portion in close engagement therewith, said sleeve being made from a material softer than the material of the cylindrical body portion.

References Cited in the file of this patent

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