

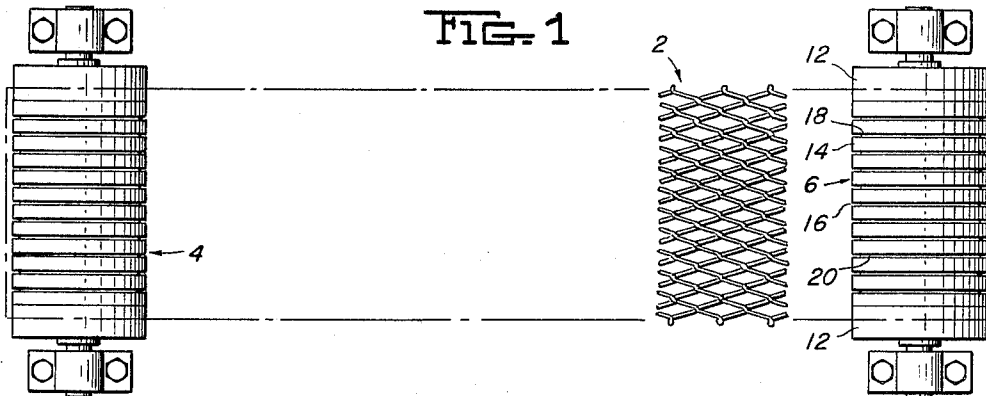
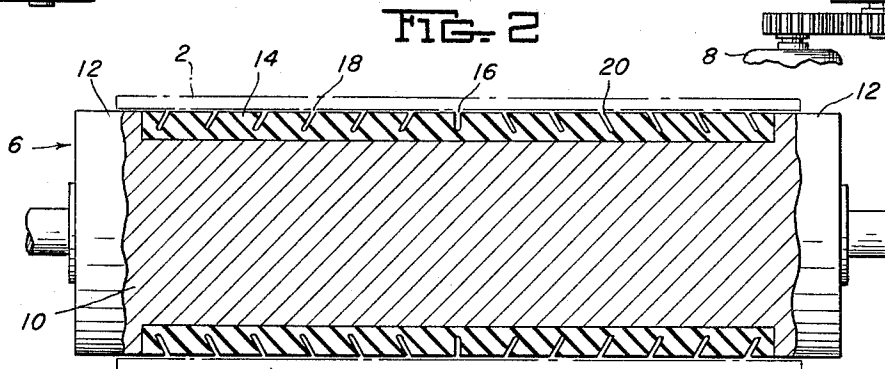
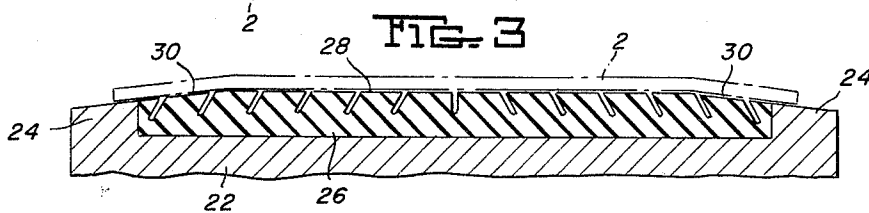
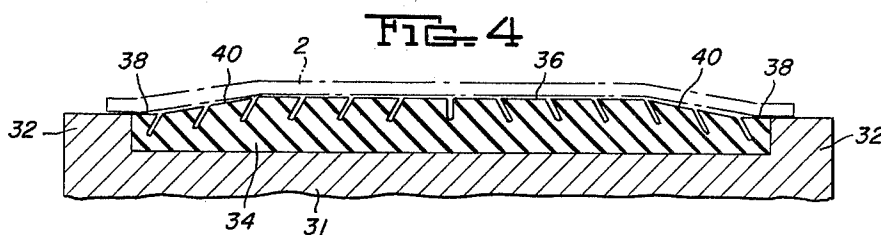
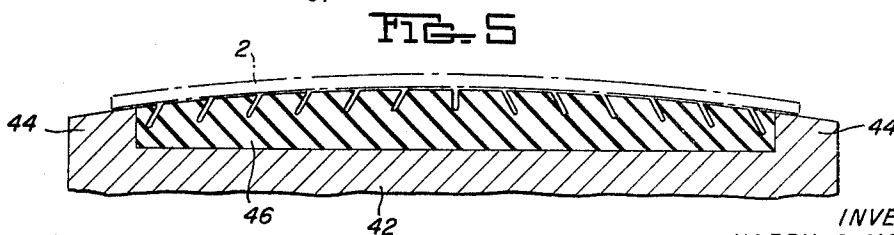
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3,288,338

APPARATUS FOR AUTOMATICALLY CENTERING ELONGATED OBJECTS

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APPARATUS FOR AUTOMATICALLY CENTERING ELONGATED OBJECTS

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This invention relates to apparatus for automatically centering elongated objects and particularly for centering endless woven metal belts. Woven metal belts are difficult to center and it has been proposed to use self-centering rolls such as shown in Lorig Patent No. 2,592,581, dated April 15, 1952 to keep the belt centered. While these rolls perform the centering function satisfactorily the rolls are rubber covered and the life of the roll is relatively short. I have found that this short life of the roll is caused by the rough or raw edges of the belt.

It is therefore an object of my invention to provide apparatus for automatically centering elongated objects having raw edges wherein rubber covered centering rolls are provided with a wear surface for the edge of the object without destroying the centering action of the roll.

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

FIGURE 1 is a plan view of an endless woven metal belt supported on head and tail self-centering rolls;

FIGURE 2 is a view, partly in section, showing a roll of my invention;

FIGURE 3 is a view showing a second roll of my invention;

FIGURE 4 is a view, similar to FIGURE 3, showing a third embodiment of my invention; and

FIGURE 5 is a view, similar to FIGURE 3, showing a fourth embodiment of my invention.

Referring more particularly to FIGURES 1 and 2 of the drawings, reference numeral 2 indicates an endless woven metal belt which may be of any standard construction. The belt 2 passes around spaced apart automatic centering rolls 4 and 6 with the roll 6 being driven by a motor 8. Since the rolls 4 and 6 have the same construction only one roll will be described in detail.

According to my invention the roll 6 has a metal shell 10 including end flanges 12. While the roll shell is shown solid it will be understood that it may be hollow. Extending between the end flanges 12 and surrounding the metal shell 10 is a rubber covering 14 having a central radial slot 16 therein and slots 18 and 20 on each side of a slot 16. The slots 18 and 20 extend from the roll surface inwardly toward the axis of the roll away from the transverse center thereof. The distance between the flanges 12 is less than the width of the belt 2 and preferably is between 2½ and 3 inches less than the width of the belt. It is preferred that the outer diameter of the flanges 12 and the rubber covering 14 be uniform over the full width of the belt.

In the embodiment shown in FIGURE 3 roll shell 22 is provided with spaced apart flanges 24 which differ from the flanges 12 in that the outer surface thereof is arranged on a taper with the diameter increasing from the end of the roll inwardly toward the transverse center. Rubber covering 26 is slotted in the same manner as rubber covering 14, but instead of having a uniform diameter the covering 26 has a central flat portion 28 of maximum diameter and tapered side portions 30. The taper of the side portion 30 is the same as the taper of the outside surface of the flanges 24.

The roll shown in FIGURE 4 has a metal shell 31, spaced apart flanges 32 which have cylindrical outer surfaces, and a rubber covering 34 having a cylindrical cen-

ter portion 36, and flat end portions 38 which are connected to center portion 36 by tapered portions 40. The diameter of the flanges 32 is the same as the diameter of flat portion 38 and the slotting of the covering 34 is the same as in the other embodiments.

In the embodiment of FIGURE 5 a metal shell 42 has spaced apart flanges 44 with a rubber covering 46 therebetween. In this embodiment the outer surface of flanges 44 and rubber covering 46 form a continuous crown. The slotting of the rubber covering 46 is the same as in the other embodiments.

It will be seen that in each of the rolls the rubber covering is of less length than the width of the belt 2 and that the outer contour of the flanges conforms to the outer contour of the rubber covering adjacent thereto so that there is a smooth transition between the metal and the rubber. In other words the diameter of the flange adjacent the rubber covering is the same as the diameter of the rubber covering adjacent thereto and the angle of the face of the flange with respect to the axis of the roll is the same as the angle of the surface of the rubber covering with respect to the axis of the roll. It will be understood that the rolls shown may be used in handling other elongated objects such as strip having raw edges and that other resilient or rubber like material may be substituted for the rubber covering.

While several embodiments of my invention have 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 an elongated metal object passing thereover which comprises a metal shell, a radial flange at each end of said shell for supporting the edges of the object, the distance between said flanges being less than the width of the object passing thereover, and a rubber like covering extending between said flanges, said covering having a central radial slot therein and spaced apart slots on each side of said radial slot extending inwardly toward the axis of the roll away from the transverse center thereof, the diameter of each flange adjacent said covering being the same as the diameter of the covering adjacent thereto and the face of the flange and the surface of the rubber covering adjacent thereto being arranged at the same angle to the axis of the roll.

2. A roll according to claim 1 in which the outer surface of the roll is cylindrical.

3. A roll according to claim 1 in which the outer surface of the covering has a central flat portion of maximum diameter and tapered side portions, and the outer faces of the flanges are tapered to a minimum diameter at the ends of the roll.

4. A roll according to claim 1 in which the outer surface of the covering has a central flat portion of maximum diameter, a flat portion of minimum diameter at each end of the covering and tapered intermediate portions connecting the central and end portions, and the outer faces of the flanges are cylindrical.

5. A roll according to claim 1 in which the outer surface of the roll is crowned.

6. An assembly comprising an endless woven metal belt, and a pair of rolls around which the belt passes, at least one of said rolls being a self-centering roll including a metal shell, a radial flange at each end of said shell, the distance between said flanges being less than the width of said belt, and a rubber like covering extending between said flanges, said covering having a central radial slot therein and spaced part slots on each side of said radial slot extending inwardly toward the axis of the roll away from the transverse center thereof, the diameter of each flange adjacent said covering being the same as the diame-

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ter of the covering adjacent thereto and the face of the flange and the surface of the rubber covering adjacent thereto being arranged at the same angle to the axis of the roll.

7. An assembly according to claim 6 in which the outer surface of said self-centering roll is cylindrical. 5

8. An assembly according to claim 6 in which the said covering has a central flat portion of maximum diameter and tapered side portions, and the outer faces of the flanges are tapered to a minimum diameter at the end of the roll. 10

9. An assembly according to claim 6 in which the said covering has a central flat portion of maximum diameter, a flat portion of minimum diameter at each end of the covering and tapered intermediate portions connecting the central and end portions, and the outer faces of the flanges are cylindrical. 15

10. An assembly according to claim 6 in which the outer surface of said self-centering roll is crowned.

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References Cited by the Examiner

UNITED STATES PATENTS

2,582,280	1/1952	Robertson	226—190 X
2,721,739	10/1955	Mursch	226—192
3,077,293	2/1963	Watkins	226—191 X

FOREIGN PATENTS

581,525	8/1959	Canada.
755,839	8/1956	Great Britain.

OTHER REFERENCES

United States Steel: The Application --- of --- Self Centering Rolls, USS Publication No. ADVL-230-53, printed in U.S.A., FIG. 7 of p. 12.

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