June 27, 1939. C. T. WALTER 2,163,926

MEANS FOR APPLYING METAL FERRULES TO FIBER CONTAINERS

Original Filed May 29, 1936 3 Sheets-Sheet 1

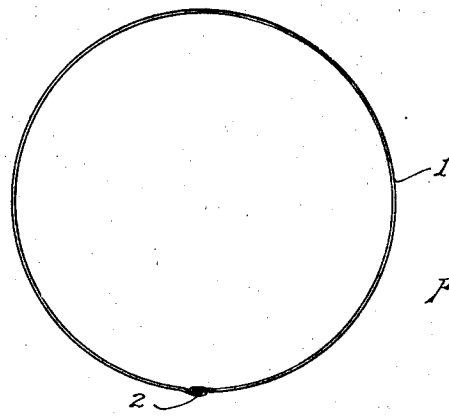


Fig. 1

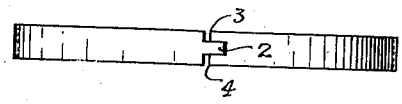


Fig. 2

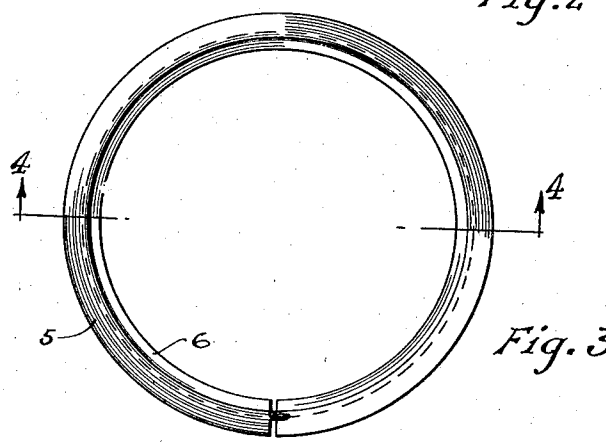


Fig. 3

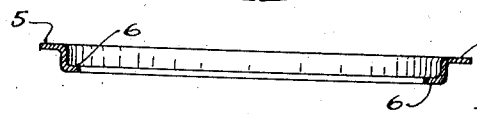


Fig. 4

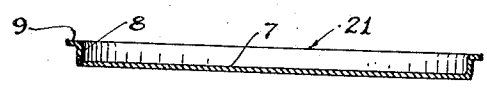


Fig. 5

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MEANS FOR APPLYING METAL FERRULES TO FIBER CONTAINERS

Original Filed May 29, 1936 3 Sheets-Sheet 2

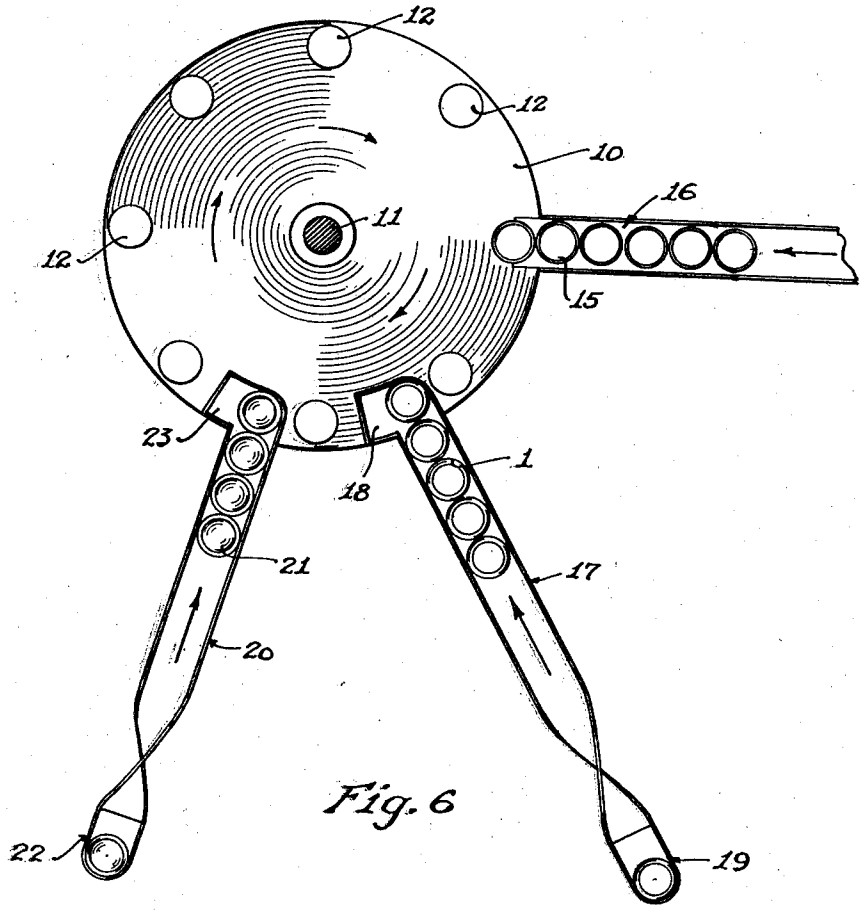


Fig. 6

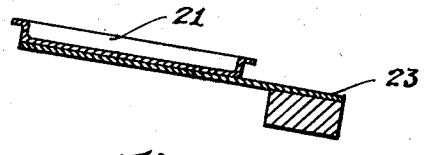


Fig. 7

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MEANS FOR APPLYING METAL FERRULES TO FIBER CONTAINERS

Original Filed May 29, 1936 3 Sheets-Sheet 3

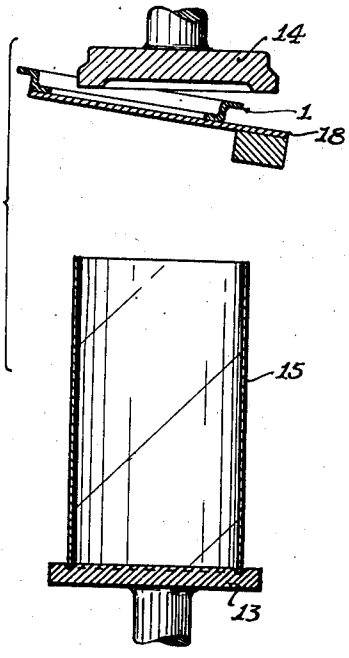


Fig. 8

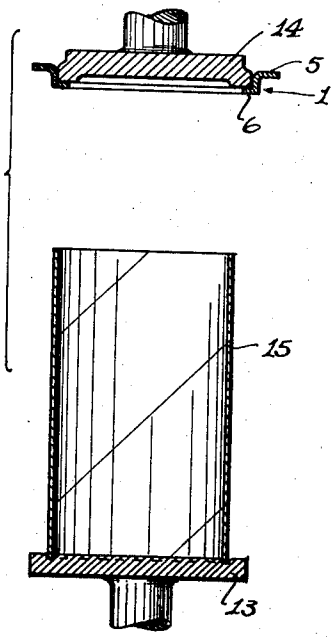


Fig. 9

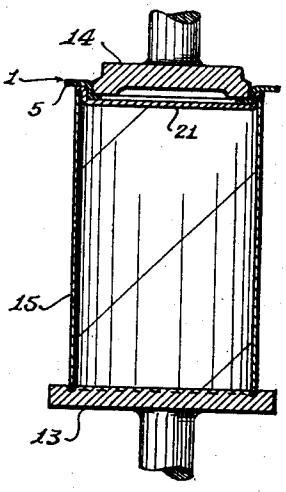


Fig. 10

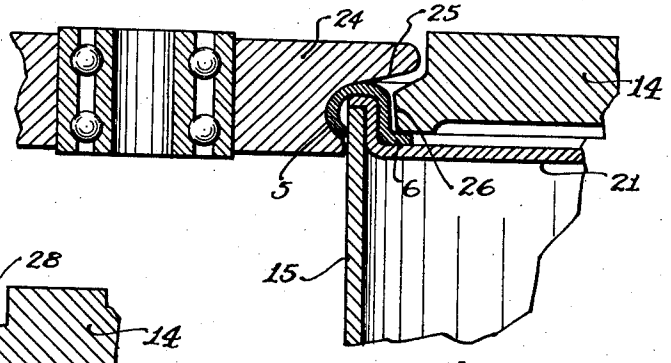


Fig. 11

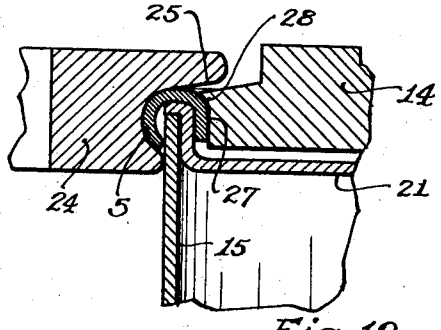


Fig. 12

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UNITED STATES PATENT OFFICE

2,163,926

MEANS FOR APPLYING METAL FERRULES TO FIBER CONTAINERS

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Original application May 29, 1936, Serial No. 82,433. Divided and this application February 23, 1937, Serial No. 127,256

1 Claim. (Cl. 153—1)

This invention relates to means for applying metal ferrules to fiber containers.

This application is a division of my copending application Serial No. 82,433, filed May 29, 1936, entitled Paper can.

One of the objects of the invention is to provide an improved means for applying metal ferrules to fiber containers.

Other objects of the invention will be apparent from the description and claim which follow.

In the drawings similar reference characters in the several figures designate similar parts.

Figure 1 is a plan view of a metallic strip formed into a circle.

Figure 2 is a side view of the metallic strip shown in Figure 1.

Figure 3 is a plan view of the metallic strip shown in the previous figures after it has been flanged.

Figure 4 is a sectional view on line 4—4 of Figure 3.

Figure 5 is a sectional view of a cupped fiber disc.

Figure 6 is a diagrammatic plan view of a machine arrangement for automatically assembling paper cans.

Figure 7 is a sectional view showing a cupped disc in the position in which it is fed to an open can body.

Figure 8 is a view, partly in section, showing the feeding of a metallic ring to the station of the assembling machine.

Figure 9 is a side view, partly in section, showing a ring in position on a chuck above a can body.

Figure 10 is a side view, partly in section, showing a cupped disc in a metallic ring in position with respect to the can body preparatory to seaming.

Figure 11 is a sectional view of a seaming chuck employed in seaming a container employing the ferrule involved in this invention.

Figure 12 is a sectional view of a modified type of seaming chuck employed in applying a modified form of ferrule omitting the inner peripheral flange.

The ferrule employed in the present invention is prepared from a narrow strip of tin plate formed into a circle with the ends joined together to form a substantial ring as shown in Figures 1 and 2.

It will be noted that the ends of the ferrule 1 are joined by lock seam 2 which embraces only the central portion of the ring. Within the area of the lock seam there are four layers of metal and to facilitate flanging the lock seam terminates somewhat short of the edges 3 and 4. The ferrule 1 is first bent as shown in Figures 3 and 4 to form outwardly extending flange 5 and inwardly extending flange 6. The area embraced by lock seam 2 is not flanged. Outwardly turned flange 5 provides metal for crimping over the can body. Inwardly turned flange 6 provides depth control for the metallic ferrule with respect to the seaming chuck and forms a flat guide surface to permit adjacent covers to rest and slide upon each other in the cover feeding mechanism.

Figure 5 illustrates a cupped fiber disc having a flat disc portion 7, upwardly extending walls 8, and flange 9.

The manner of automatically assembling paper cans is shown in Figure 6 in which framework or turret 10 rotates about shaft 11 in the direction of the arrows. Turret 10 carries a number of can seaming stations 12. Each station comprises a lower rotatably mounted can body supporting table 13 and a rotatably mounted seaming chuck 14 as is more particularly shown in Figures 8, 9 and 10.

Tubular fiber can bodies 15 are delivered to the machine by conveyor 16 so that as each station 12 passes the conveyor input it picks up an open can body 15. Adjacent to the can body feed conveyor 16 and positioned above it is a ferrule feeding conveyor 17 arranged with respect to the seaming chucks 14 as shown in Figure 8. The conveyor 17 and shuttle 18 are of the conventional type. As each station passes ring shuttle 18, seaming chuck 14 picks up a metallic ring 1 as shown in Figure 8 in which ring 1 is shown resting on shuttle 18 in a sloping position with respect to the plane of motion of chuck 14. The shuttle 18 is flexible so as to permit ring 1 to be readily withdrawn by chuck 14. Ring 1 is shown in position on chuck 14 in Figure 9. Adjacent to conveyor 17 is a second feeding conveyor 20 which serves to deliver cupped fiber discs 21 to the seaming chuck. Conveyor 20 is also equipped with an automatic feeding device at 22. Both feeding devices 19 and 22 feed their respective objects from a stack arranged with the objects stacked in piles with the flanges of each pile in contact.

Conveyor 20 is equipped with shuttle 23. The arrangement of conveyors and sloping shuttles shown in Figure 6 is conventional. As each seaming station moves from conveyor 17 to conveyor 20, seaming chuck 14 carries with it a metallic ring 1. At shuttle 23 each station picks up a cupped paper disc 21 as indicated in Figure 7. The seaming chuck now holds a metallic ring

1 under which is placed a cupped disc 21. These two objects are now in a position to be placed into the can body preparatory to seaming, which operation is illustrated in Figure 11, at which station the outer flange 5 is crimped over the outer edge of the can body.

Figure 11 shows a seaming chuck having a seaming roll 24 of typical cross section. Seaming roll 24 has a conical surface 25 which extends to a point closer the center of rotation of can body 15 than edge 26 of the seaming chuck 14. Extended conical surface 25 engages the straight surface of outward flange 5 before it is crimped to cause it to positively assume a concave curvature downwardly. It will be clear, therefore, that the thickness of surface 26 can not be substantially relatively greater than shown in Figure 11. Therefore, in order to control the depth at which chuck 14 can enter ring 1 and at the same time exert a downward pressure between ring 1 and can body 15, inwardly turned flange 6 must be provided. If inward flange 6 were not provided and the metallic ring 1 were the type shown in Figure 12, chuck 14 would not exert the necessary pressure between the can cover and can body. If it is desired to eliminate flange 6 from the metallic ring and employ a ring of the type shown in Figure 12, seaming chuck 14 may be modified to accommodate the conditions as shown in Figure 12 where working surface 27 is provided with an outwardly tapered upper extremity 28 designed to engage the correspondingly curved surface of ring 1 in such a manner as to exert a downward force between the can cover and the can body and yet at the same time clear the conical extension 25 of the seaming chuck.

I claim:

In a can seaming device for applying a cupped fibrous end to a fibrous tubular body by means of a metallic ferrule, the ferrule comprising a vertical wall adapted to fit within the cupped fibrous end and a flanged wall bent outwardly from the vertical wall, the flanged wall being adapted to extend above the end edges of the cupped end and tubular body and beyond the outer wall of the tubular body to provide a portion adapted for crimping to the outer wall of the tubular body, the edge joining the vertical wall with the flanged wall providing a curved outer surface, the combination of a seaming chuck adapted to engage the inner surface of the vertical wall and provided with an outwardly curved upper peripheral surface designed to engage the curved edge joining the vertical wall with the flanged wall and to press the ferrule and fibrous end within the end of the tubular body, and a seaming roll rotatably mounted in operative relation with the seaming chuck provided with an extended conical surface adjacent its upper peripheral edge, the conical surface being operable to engage the portion of the flanged wall extended beyond the tubular body to cause it to assume a concave curvature downwardly before crimping to the outer wall of the tubular body and simultaneously to engage the portion of the flanged wall extended above the end edges of the cupped end and tubular body to prevent upper bowing of the last-mentioned portion of the flanged wall during the crimping operation.

CHARLES T. WALTER.