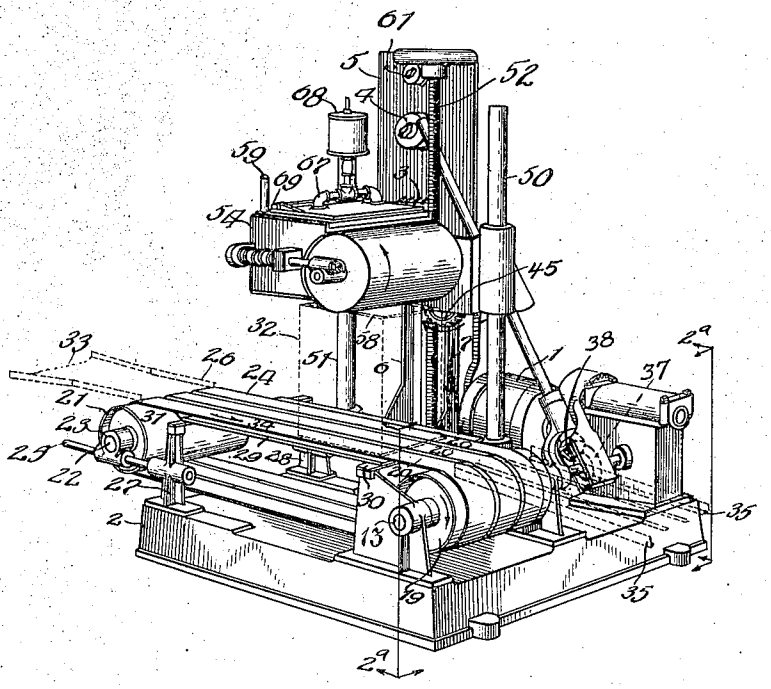
Jan. 2, 1923. 1,440,681

J. M. HOTHERSALL.
FLANGE LINING MACHINE.
ORIGINAL FILED JAN. 5, 1917. 3 SHEETS-SHEET 1

Fig. 1



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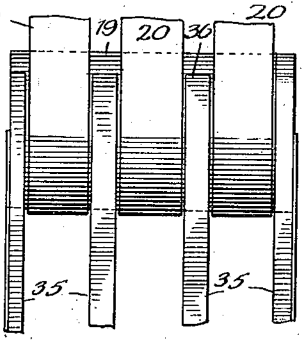
Jan. 2, 1923. 1,440,681

J. M. HOTHERSALL.

FLANGE LINING MACHINE.

ORIGINAL FILED JAN. 5, 1917. 3 SHEETS-SHEET 2

Fig. 7



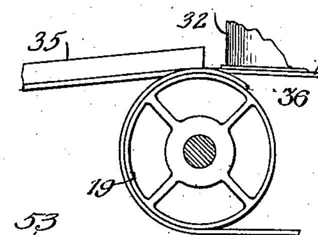
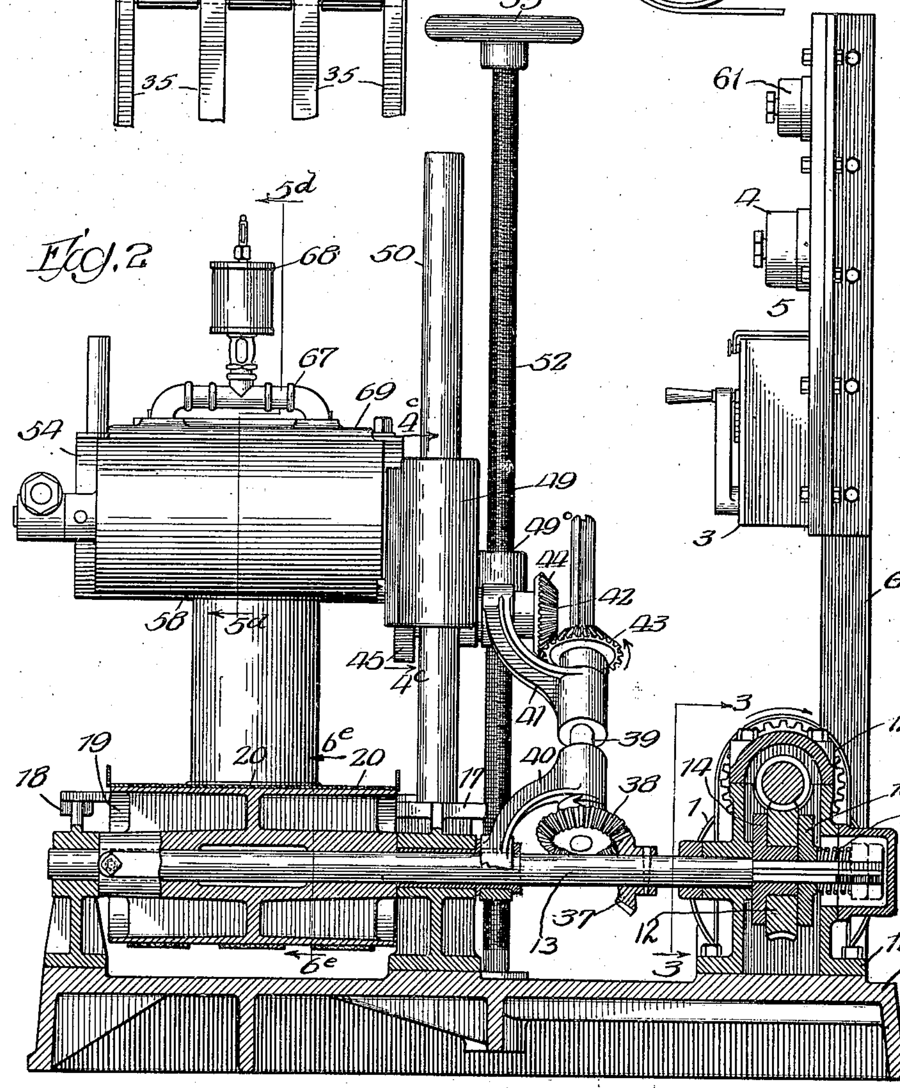


Fig. 6

Fig. 2



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Jan. 2, 1923.

1,440,681

J. M. HOTHERSALL.
FLANGE LINING MACHINE.
ORIGINAL FILED JAN. 5, 1917.

3 SHEETS-SHEET 3

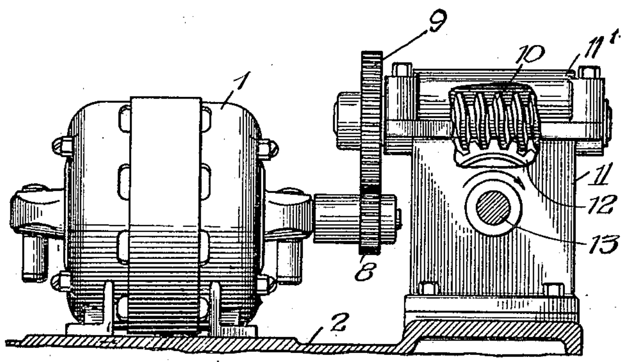

Fig. 3

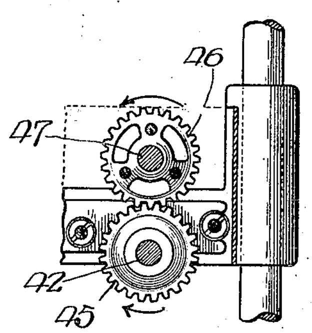

Fig. 4

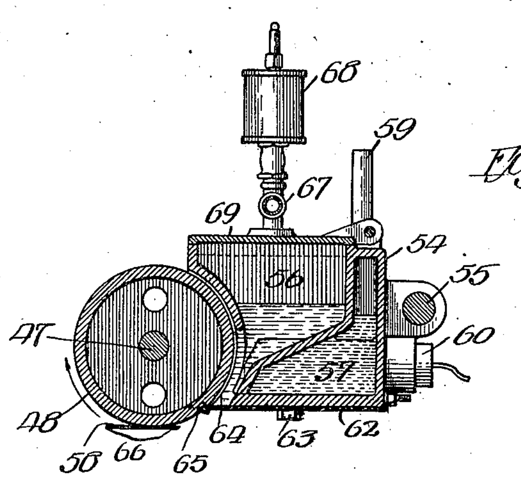

Fig. 5

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BY

ATTORNEYS

Patented Jan. 2, 1923. 1,440,681

UNITED STATES PATENT OFFICE.

JOHN M. HOTHERSALL, OF BROOKLYN, NEW YORK, ASSIGNOR TO AMERICAN CAN COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

FLANGE-LINING MACHINE.

Application filed January 5, 1917, Serial No. 140,667. Renewed June 5, 1922. Serial No. 565,896.

To all whom it may concern:

Be it known that I, JOHN M. HOTHERSALL, a citizen of the United States, residing in Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Flange-Lining Machines, of which the following is a specification.

This invention relates in general to the art of securing flanged can ends to flanged can bodies with an interfolded seam, and has for its object broadly the provision of a method or process for accomplishing this operation to produce an economical and perfectly hermetic seal. The invention also contemplates an improved apparatus for accomplishing this result.

Prior to my invention it has been generally the custom to deposit a flange lining compound on the flange of the can end by moving the flange beneath a nozzle from which the compound is ejected. If the cans to be closed are of other than circular cross-section the application of the compound in this manner has necessitated complicated machinery for, if the nozzle be stationary an irregular movement must be given the flange to cause the complete flange to pass under the nozzle, or if the flange be stationary a like irregular movement must be given the nozzle. Either requires involved or complicated machinery and considerable mechanical changes if different shapes or sizes of can ends are to be lined.

A highly important object of this invention is the provision of an apparatus for applying lining material to one of the flanges to be interfolded, which may be readily adjusted for cans of differing dimensions and of differing shapes.

Another important object of the invention is the provision of a mechanism or apparatus adapted to permit the use of a greatly heavier compound than usual, which is nevertheless provided in a thin film which may be almost immediately formed into the seam.

A still further object of the invention is the development of the art of closing can ends in the manner described, which will be of easy practice or operation and which will cheapen materially the process.

Other objects and advantages of the invention will be apparent as it is better understood from the following description when considered in connection with the accompanying drawing illustrating a preferred embodiment thereof.

On the drawing,

Figure 1 is a perspective view of an apparatus embodying my present invention;

Figure 2 is a section taken upon the lines 2—2 of Fig. 1 and looking in the direction indicated by the arrows *a*, *a*;

Fig. 3 is a section taken substantially on the line 3—3 of Fig. 2;

Fig. 4 is a section taken substantially on the line 4—4 of Fig. 2 and looking in the direction of the arrows *c*;

Fig. 5 is a section taken substantially on the line 5—5 of Fig. 2 and looking in the direction of the arrows *d*;

Fig. 6 is a section taken substantially on the line 6—6 and looking in the direction of the arrows *e* in Fig. 2; and

Fig. 7 is a plan view of so much of the mechanism as is shown in Fig. 6.

Referring to the drawings, reference character 1 indicates an electric motor mounted upon a main base 2 of the apparatus. The motor 1 is controlled by a rheostat 3 and a switch 4, the rheostat 3 and the switch 4 being supported by a plate 5 carried upon suitable upright members 6 and 7, the latter being in turn carried upon the base 2. The motor 1 delivers power through the medium of a number of spur gears 8 and 9 to a worm 10, which worm 10 has a bearing in the worm case 11 and cover 11′, the worm case 11 being also secured upon the base 2. The worm 10 (Fig. 3) acts directly upon a worm wheel 12 which actuates a main driving shaft 13 through a friction transmission, which friction transmission consists of pressure plates 14 and 15 mounted upon and to turn with the shaft 13 and spring 16 acting directly upon the plate 15 to hold the parts in clutching relation.

The driving shaft 13 has a bearing in the worm case 11 at one end and in a bracket 18 at the other and a central bearing in the bracket 17, brackets 17 and 18 being secured upon the base 2.

A pulley 19 is mounted upon the shaft 13 between the brackets 17 and 18 and a three-part belt 20 is trained over this pulley and receives motion from it. The three-part belt is also trained over a pulley 21, which is

a loose pulley, and is mounted in bearings 23 and 24. These bearings are supported by rods 25 extending out from the bearings 27 and 28. On the drawing the arrangement at one side only is completely shown, it being understood that the arrangement at the opposite side is a substantial duplicate. This arrangement permits of the ready adjustment of the tightness of the three-part belt. The members or parts of this belt are spaced apart as indicated in Figs. 1, 2 and 7 for a purpose which will be later described.

Underneath the upper limb of the belt and between the power pulley 19 and the idle pulley 21, a plate 29 is positioned and supported by cross-members 30 and 31, the cross-member 30 being fastened upon the top of the bearing brackets 17 and 18, and the cross-member 31 upon the top of the bearing bracket 27 and 28. The belt in moving onto this support receives can bodies to be treated and the support causes the belt to have a smooth and level operative travel. The cans 32 are delivered on to the belt from a chute or table 33 traveling in the direction of the arrow 34 and they leave the belt on to slats 35 forming a second chute or table.

The belt forms a conveyor for moving the cans beneath a roller numbered 48 on the drawing, which roller, as will be presently described, causes a film or coating of flange lining compound to be applied to the flange 58 of the can body.

This roller receives continuous motion from the shaft 13 and to this end I have provided a bevel gear 37 upon the shaft 13, which gear meshes with a similar bevel gear 38 secured on the lower end of an inclined shaft 39. This shaft is supported in two brackets 40 and 41, the bracket 40 having a bearing upon the shaft 13 itself and forming in turn a bearing for the lower end of the shaft 39. Bracket 41 is movable along the shaft 39 and has a bearing in turn upon a shaft 42 which carries a pinion 44 in mesh with a pinion 43 movable with but slidable upon the shaft 39. The shaft 42 also carries a pinion 45 meshing with a pinion 46 upon the roller shaft 47, the shafts 42 and 47 having bearings in a head 49 mounted to move vertically upon two rods 50 and 51 supported from the base 2. When thus arranged, the head 49 may be moved vertically without destroying or altering the operative connection between the roller shaft 47 and the main driving shaft 13. Vertical movement is given to the head 49 to adjust the apparatus to cans of different height and this is the only adjustment needed to adapt the machine to operate upon cans of different sizes and different shapes. This vertical adjustment is imparted to the head by a screw 52 carrying at its top a hand wheel 53. It will be manifest that the roller receives a continued rotation in synchronism with the movement of the conveyor and that the motion of the two is in the same direction. The roller in its movement travels adjacent the tank 54, which is divided into two compartments,—one 56 for the compound and the other 57 for the heating fluid, as water. This tank is mounted upon the head 49 by a rod 55 and water in the compartment 57 is heated electrically by heating coils 60 controlled from a switch 61 upon the plate 5. The tank is placed closely adjacent the roller 48, the side being curved as shown in Fig. 5. The lower part of this side is cut away at 64 to permit the compound to contact with the roller as it turns. A scraper 62 is fastened at the bottom of the tank and this scraper operates to determine the depth of film or coating applied to the roller as it turns past the opening 64. This opening is advantageously arranged near the line of application of the film to the flange 58 as is indicated in Fig. 5. A drip cup 68 is provided upon the tank and adapted to supply a limited quantity of water to the compartment 56 as the compound dries out by evaporation, and water may be supplied to the compartment 57 through a pipe 59.

In the operation of the apparatus, the cans are carried continously under the roller, which acts as a feeder receiving first a film or coating of compound and then bringing this film or coating into contact with the flange 58 of the cans, depositing from this contact sufficient coating upon the flange to form the desired seam. The can passes between the roller and the conveyor and the relative movement between the two causes the roller to roll over the flange with substantially a pure rolling action which does not permit the flange to scrape the material from the roller.

The chute parts 35 enter between the belt parts 20 and are of substantially the same thickness so that the cans slide easily from the conveyer out of the apparatus.

Since the material is thus mechanically applied as a film and not run from a nozzle, a heavier compound can be used than has heretofore been considered possible. My invention contemplates the provision of a thicker or less fluid compound in a thinner film. This permits the can ends to be immediately applied and the compound, while still plastic, to be forced throughout the seam.

It will be manifest from the foregoing that there is substantially no waste of compound and that the amount applied to each flange can be accurately gauged and controlled so that only the amount actually needed to form the seam is used. The ap-

paratus is simple and devoid of complicated or delicate parts likely to become disarranged.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing any of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. In an apparatus for applying flange lining compound to the flanges of flanged can bodies, the combination of a can-supporting and carrying endless conveyer, a compound-applying roll arranged opposite to said conveyer and having a rolling action on the can flanges as the cans are moved past and against said roll by the conveyer while resting on the same in an erect position, means for supplying lining compound to said roll, and mechanism for actuating said conveyer and turning said roll so that their opposing surfaces move in the same direction.

2. In an apparatus for applying flange lining compound to the flanges of flanged can bodies, the combination of a can-supporting and carrying endless conveyer, a compound-applying roll arranged opposite to said conveyer against which the flanges of the cans are pressed by said conveyer and having a rolling action on the can flanges as the cans are moved past and against said roll by the conveyer while resting on the same in an erect position, means for supplying lining compound to said roll, and mechanism for actuating said conveyer and turning said roll so that their opposing surfaces move in the same direction.

3. In an apparatus for applying flange lining compound to the flanges of flanged can bodies, the combination of a can-supporting and carrying endless conveyer belt, a compound-applying roll arranged opposite to said conveyer against which the flanges of the cans are pressed by said conveyer and having a rolling action on the can flanges as the cans are moved past and against said roll by the conveyer while resting on the same in an erect position, means for supplying lining compound to said roll, and mechanism for actuating said conveyer and turning said roll so that their opposing surfaces move in the same direction.

4. In an apparatus for applying flange lining compound to the flanges of flanged can bodies, the combination of a can-supporting and carrying endless conveyer, a compound-applying roll arranged opposite to said conveyer and having a rolling action on the can flanges as the cans are moved past and against said roll by the conveyer while resting on the same in an erect position, a compound supply tank having an opening in its lower part in which the roll fits for supplying lining compound to said roll, and mechanism for actuating said conveyer and turning said roll so that their opposing surfaces move in the same direction.

5. In an apparatus for applying flange lining compound to the flanges of flanged can bodies, the combination of a can-supporting and carrying endless conveyer, an upwardly extending frame element at one side of the conveyer, a frame adjustable upward and downward on said frame element and extending laterally over the conveyer, a compound supply tank and applying roll carried by said adjustable frame whereby the applying roll is suspended over the conveyer, and mechanism for actuating said conveyer and turning said roll so that their opposing surfaces move in the same direction.

6. In an apparatus for applying flange lining compound to the flanges of flanged can bodies, the combination of a can-supporting and carrying endless conveyer, an upwardly extending frame element at one side of the conveyer, a frame adjustable upward and downward on said frame element and extending laterally over the conveyer, a compound supply tank and applying roll carried by said adjustable frame whereby the applying roll is suspended over the conveyer, and mechanism for actuating said conveyer and turning said roll to apply lining compound to the top surfaces of the can body flanges.

7. In an apparatus for applying flange lining compound to the flanges of flanged can bodies, the combination of a can-supporting and carrying endless conveyer, an upwardly extending frame element at one side of the conveyer, a frame adjustable upward and downward on said frame element and extending laterally over the conveyer, a compound supply tank and applying roll carried by said adjustable frame whereby the applying roll is suspended over the conveyer, and the can body flanges are pressed against the roll by the conveyer, and mechanism for actuating said conveyer and turning said roll so that their opposing surfaces move in the same direction.

8. In an apparatus for applying flange lining compound to the flanges of flanged can bodies, the combination of a can-supporting and carrying endless conveyer, a vertical standard at one side of the conveyer, a frame adjustable vertically on said standard and extending laterally over the conveyer, a compound supply tank and applying roll carried by said adjustable frame whereby the applying roll is suspended over

the conveyer, means for adjusting said frame, and mechanism for actuating said conveyer and turning said roll so that their opposing surfaces move in the same direction.

9. An apparatus for applying flange lining compound to the flanges of flanged can bodies, comprising, a receptacle for containing said compound, a feeder at the side of said receptacle for receiving a film of said compound from said tank and supplying it to the flange of a can body, a conveyer movable under and past said feeder for carrying the cans in an erect position under said conveyer with their top flanges pressed upward against the same, means for driving said roller and said conveyer at appropriate relative speeds, and means for producing at will a relative movement between said roller and conveyer to adapt the apparatus to cans of different height or length.

10. In an apparatus for applying flange lining compound to the flanges of flanged can bodies, comprising, a conveyer for transporting said bodies, pulleys over which said conveyers move, a roller adapted to receive a film or coating of compound, and a connecting rod between said roller and one of said pulleys for imparting rotary movement from one to the other, said connecting rod having bearings supported from the shafts of said pulley and said roller.

11. In an apparatus for applying flange lining compound to the flanges of flanged can bodies, the combination, of a roller for receiving a film or coating of said compound and applying the same to the flanges of flanged can bodies, and a tank for providing said film, said tank being divided into a plurality of compartments, one of which is adapted to receive the compound and another to contain a heating medium for maintaining the compound at desired fluidity and having a fluid containing part extending in proximity to the roller.

12. In an apparatus for applying flange lining compound to the flanges of flanged can bodies, the combination of a roller for receiving a film or coating of said compound and applying the same to the flanges of flanged can bodies, and a tank for providing said film, said tank being divided into a plurality of compartments, one of which is adapted to receive the compound and another having a portion located adjacent the line of application of said fluid and in proximity to the roller, being adapted to contain a fluid heating medium for maintaining the compound at desired fluidity.

13. In an apparatus for applying flange lining compound to the flanges of flanged can bodies, the combination of a supply tank for such compound having an opening in the side thereof, a feed roll operating opposite to said opening, a scraper acting near the bottom of the roll for regulating the film of compound on the roll, a conveyer operating in a path under said roll for carrying cans and applying their flanges upward thereto, and actuating mechanism for said roll and conveyer.

14. In an apparatus for applying flange lining compound to the flanges of flanged can bodies, the combination of a supply tank for such compound having an opening in the side thereof, a feed roll operating opposite to said opening, a scraper acting near the bottom of the roll for regulating the film of compound on the roll, a conveyer operating in a path under said roll for carrying cans and applying their flanges thereto, and actuating mechanism for said roll and conveyer, said tank having a partition forming a compartment for heating means extending to near the lower part of said opening.

15. In an apparatus for applying flange lining compound to the flanges of flanged can bodies, the combination of a supply tank for such compound having an opening in the side thereof, a feed roll operating opposite to said opening, a scraper acting near the bottom of the roll for regulating the film of compound on the roll, a conveyer operating in a path under said roll for carrying cans and applying their flanges thereto, and actuating mechanism for said roll and conveyer, said tank having a compartment for heating means under the body of the compound and near said opening.

16. In an apparatus for applying flange lining compound to the flanges of flanged can bodies, the combination of a supply tank for such compound having an opening in the side thereof, a feed roll operating opposite to said opening, a scraper acting near the bottom of the roll for regulating the film of compound on the roll, a conveyer operating in a path under said roll for carrying cans and pressing their flanges upward against the same, and actuating mechanism for said roll and conveyer, said tank and roll and said conveyer having means for relative adjustment to vary the distance between the conveyer and roll.

Signed in the presence of two subscribing witnesses.

JOHN M. HOTHERSALL.

Witnesses:
W. J. LYNCH,
G. H. CASPER.