Jan. 25, 1927. 1,615,325

W. CAMERON

FALSE WIRING AND SEAMING MECHANISM

Filed May 14, 1925 2 Sheets-Sheet 1

Fig. 1.

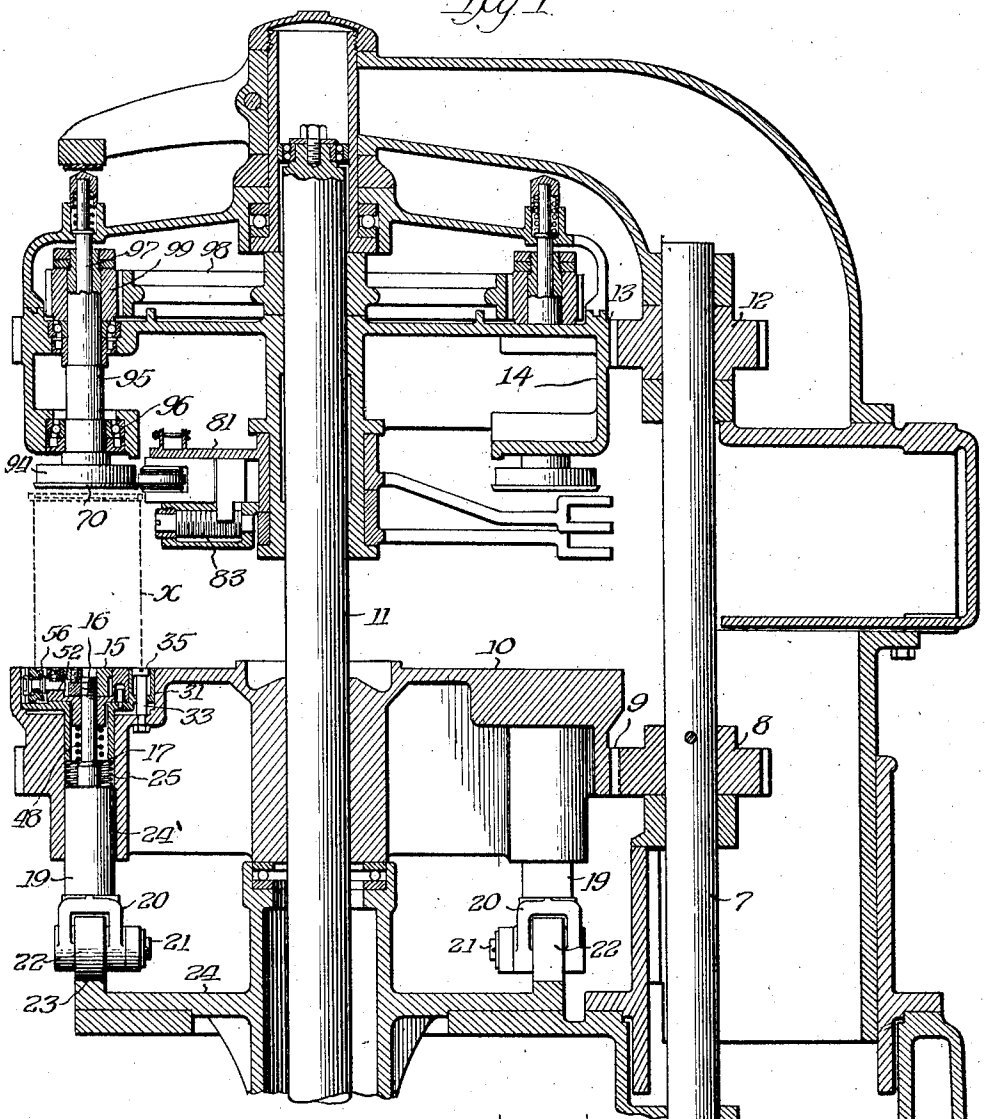
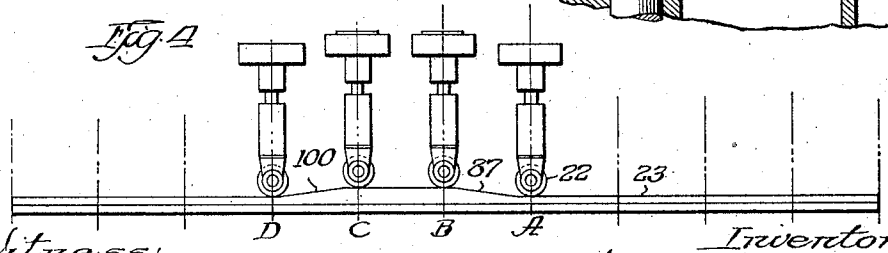


Fig. 4.



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Fig. 2.

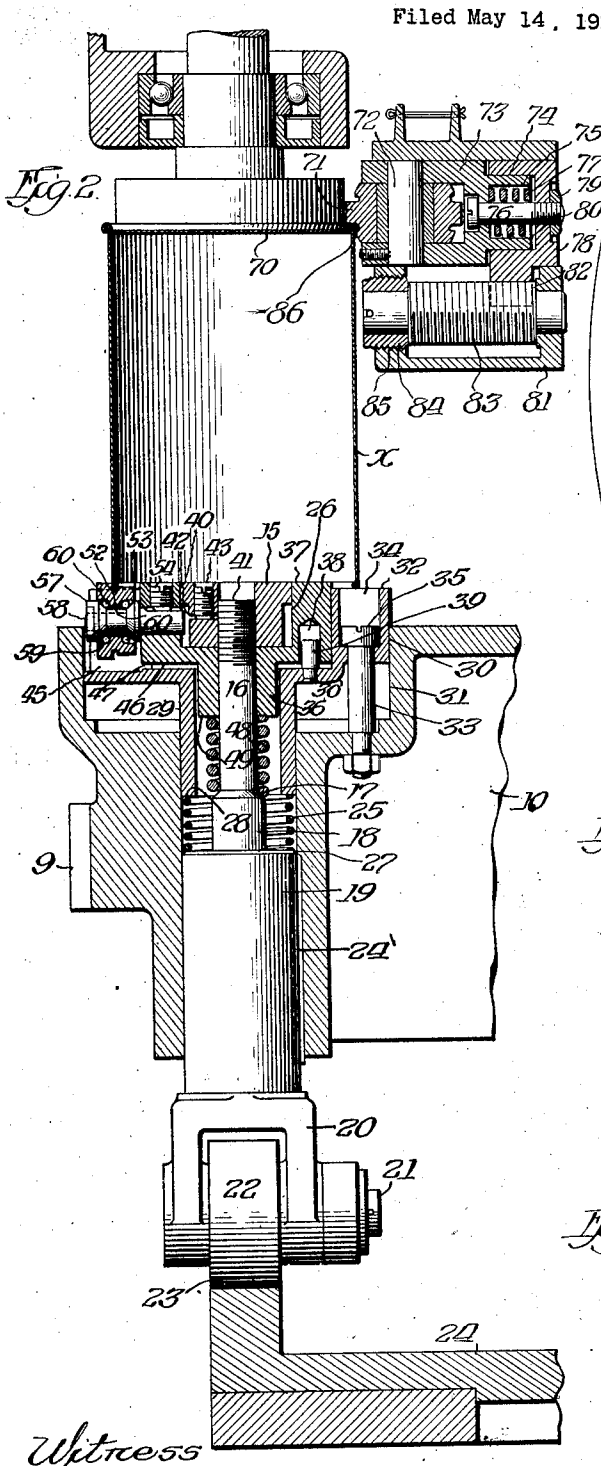


Fig. 3.

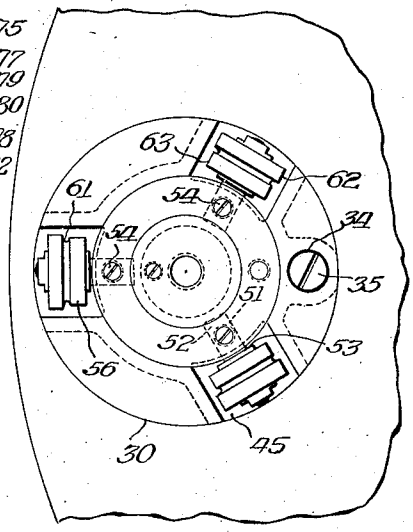


Fig. 5.

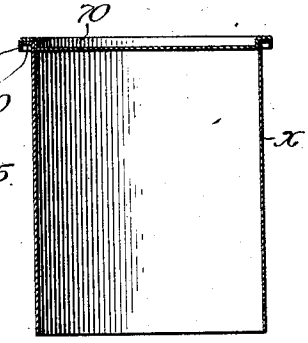
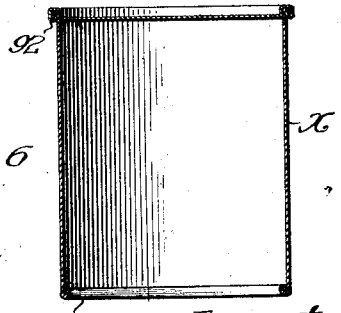


Fig. 6.



Witness

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UNITED STATES PATENT OFFICE.

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FALSE WIRING AND SEAMING MECHANISM.

Application filed May 14, 1925. Serial No. 30,139.

My invention relates to can forming machines and particularly to a mechanism for seaming a cap onto one end of a cylindrical body, and for false wiring the other end of said body during a continuous passage of the body through the machine.

Various forms of individual machines for performing these two operations are well known in the art, but heretofore no single machine has been devised for performing both of these operations during a continuous movement of the blank through the machine.

My improved mechanism is designed primarily for and adapted to be included in a can machine of the form shown in my application for United States Letters Patent, filed March 22, 1923, Serial No. 626,733, under the title of Double seaming machines. However, I do not limit myself to the employment of any particular device or construction for the embodiment of this invention, as the principles thereof may be applied in many different constructions as will be readily apparent from a perusal of the drawings in connection with the specification and claims hereinafter set forth. However, for the purpose of explanation and a better understanding of the mechanism, I shall describe the same in connection with the construction in said application.

A particular feature of the invention herein disclosed is that the machine is capable of quick and accurate adjustment by the interchangeability of a few parts, so that it can be made to accommodate can bodies of various heights and sizes, and on account of its possessing few moving and operating parts, it is extremely accurate and reliable in operation and very durable.

Another feature of the invention is the rapidity with which the two operations are performed in this machine which will recommend it at once to those interested in this art.

Referring to the drawings,

Fig. 1 is a partial vertical sectional view of a machine embodying my invention,

Fig. 2 is a like view showing some of the operating parts in different position,

Fig. 3 is a top plan view of the can body supporting and false wiring mechanism,

Fig. 4 is a developed view of the can body lifting cam mechanism operated thereby.

Fig. 5 is a longitudinal sectional view of the can body and cap before being operated upon, and

Fig. 6 is a like view of the body after being operated upon.

Like symbols of reference herein indicate like parts in each of the figures of the drawing.

Reference numeral 7 indicates a vertical shaft which rotates in a counterclockwise direction through the medium of the mechanisms shown in the aforementoned application, and for the purpose of this description let us assume that this shaft corresponds with the shaft 74 therein shown with all its attendant driving mechanism. The shaft 7 is provided with a spur gear 8 which meshes with the gear face 9 on the lower spider 10 to rotate said spider on the shaft 11.

The shaft 7 is also provided at a point near its upper end with a pinion 12 which meshes with a ring gear 13 on the upper spider 14. This upper spider 14 is also rotatably mounted on the shaft 11 and as the pinions 8 and 12 are of the same size, the lower spider 10 and the upper spider 14 will be caused to rotate in a clockwise direction at a uniform rate of speed.

The lower spider 10 is provided with a plurality of can body supporting and lifting devices 15 spaced equidistant around the said spider and for the purpose of this invention I have shown the spider to have ten of the same, as will readily be seen from the developed diagrammatic view shown in Fig. 4 with each of the said devices thirty-six degrees apart. Each of these can supporting devices is carried upon a post 16 having a tapered shoulder 17 above the enlarged portion 18, while the large bottom 19 of said post 16 is bifurcated to form the arms 20 in which, upon a shaft 21, is mounted a roller or cam follower 22 adapted to travel upon a circular cam 23 surrounding the base 24 of the machine. The portion 19 of each post is slidably mounted in a vertical guide bearing 24 of said spider and a spiral spring 25 interposed between the shoulder 27 and the lower end 28 of the sliding sleeve 29

depending from the table member 30, provides a yieldable connection between the post and table.

The circular perimeter of each table 30 slidably fits in a socket 31 with its upper face 32 normally flush with the upper face of the spider but adapted to be elevated above the plane of the spider as shown in Fig. 2. This upward movement is limited by headed studs 33, the head 35 of which is relatively slidable in the socket 34 formed in the table so that the table is held by the stud against rotation, but may move upwardly until the bottom of the socket abuts against the head 35. Within the table 30 and having a downwardly extending portion 36 extending into the interior of the sleeve 29, is a block 37 which has a countersunk hole 38 therein for the reception of a pin 39 extending upwardly from the table to prevent rotation of the block. Said block is secured in position by a circular nut 40 engaged with the threaded upper portion 41 of the post 16 and fits within the countersunk portion 26 in the center of the member 36. This nut is split at 42 and a set screw 43 projecting into the kerf is adapted to lock said nut against displacement. A spiral spring 48 surrounding the post 16 between the tapered shoulder 17 and the bottom face of the downwardly extending portion 36 of the block 37 normally holds the block in elevated position so as to provide a clearance space 47 between the body of the block and the bottom of the socket 45.

The annular recess in each table in which the block 37 is accommodated is shaped to provide a plurality of, in this instance, three, radial extensions to receive the false wiring rolls 56.

Each block 37 is provided with correspondingly postioned openings 51 for the reception of stub shafts 52 upon which the rolls 56 are mounted. Each shaft is provided with a collar 53 which abuts against the opposed face of the block and each shaft is locked in position by a set screw 54. The outer face 51 of the collar 53 is tapered and between this collar and a similar collar 57 having a tapered face 59 is rotatably mounted a die roll 56. The collar 57 is held in position by a lock screw 58 and the die roll is rotatably carried upon the collars by ball bearings 60.

The die rolls 56 are each formed with a peripheral shaping groove 61 for curling in one edge of the can body while the outer portion 62 of each roll is of greater diameter than the inner portion 63 for a purpose which will be later explained.

In the path of travel of the can cap 70 is mounted a seaming roll 71 which is rotatable on a shaft 72 fixed in the bifurcated block 73 which has an extension 74 provided with a recess 75. The block is secured to its supporting member 78 by a countersunk bolt 76 provided with a nut 79. An expansion spring 77 disposed in the recess 75 urges the seaming roll outwardly into working position, and the lost motion space 80 between the block and the member 78 permits the roll to yield inwardly under excessive pressure, against the force of the spring. The member 78 and the seaming roll are radially adjustable in the member 81 by means of an adjusting screw 83 threadedly engaged with an extension 82 depending from the member 78. One of the bearings 84 for this screw is removably threaded into the member 81 as indicated at 85 to facilitate assembly of the parts.

There may be either one or a plurality of seaming rolls 71 for accomplishing the double seaming of the can cap to the body, and the forming groove will be shaped accordingly. For the purpose of this invention, however, we will consider that the double seaming is done by a single roll such as is shown in Figs. 1 and 2.

The cap and body spinning mechanism which is precisely the same as that shown in my aforementioned application, consists of a series of hollow chuck spindles 95, each carrying at its lower end a cam cap engaging chuck 94, shaped on its lower face to fit the top of the cap. An upward thrust upon the chuck and spindle exerted by upward pressure of the body and cap produced by the action of the cam 23 upon the lifting rolls 22 is absorbed in the anti-friction roller bearings 96 with which each spindle is equipped. This mechanism is operated through the medium of the gear 98 and the pinions 99.

In the operation of a machine embodying my invention, the can caps and bodies are fed into their respective vertically aligned pockets in the spider by any suitable mechanism such, for instance, as that disclosed in my pending application above referred to, each body being disposed upon end supported by one of the supporting mechanisms 15 which is in its lowered position as shown in Fig. 1, and at this instant, let us suppose that the roller or cam follower 22 is at the position indicated by the letter A in Fig. 4. The can cap 70 being positioned above the cylindrical body, the roller or cam follower 22 starts up the inclined face 87 of the cam 23 and such travel will cause the post 16 and the nut 40 to be elevated, while the table 30 will also have a tendency to rise with the said nut because of the action of the spring 25. The bottom edge of the can body being disposed directly over the forming grooves in the rolls 56 will, upon this upward movement of the post 16 and table 30, enter the grooves and be turned or curled in to conform to the shape thereof as the body is rapidly spun or revolved by the

action of the rotating spindle 95. If the shortening of the can body by reason of the false wiring or turning in of the bottom edge of the can body by the rolls is less rapid than the rise of the cam follower 22 on the inclined face 87 of the cam 23, the spring 48 will yield under the pressure exerted upon the block 37 thereby compensating for this difference and at the same time maintaining the pressure of the rolls against the end of the body.

This compression of the spring 48 can only be accomplished to the distance of the space 47 between the bottom 46 of the block and the bottom of the recess in the table 30. This resilient engagement of the roller 56 with the bottom edge of the can body is also enchanced by the spring 25 located between the bottom 28 of the sleeve 29 and the shoulder 27 of the spindle. The upward movement of the tables 30 is limited and rotation thereof is prevented by the headed studs 33 while the rotation of the block 37 is prevented by the pin 39 extending into the recess 38.

During the initial travel of the cam follower 22 up the rise 87 of the cam 23, the body X of the can which has previously been flanged as at 90 in Figure 5, is elevated into the cap 70 which has previously had the downwardly extending flange 91 formed theron, and the body and cap are clamped between the rising table and the spindle chuck 94. The spinning of this chuck causes the cap and body to revolve as a unit at a high speed so that the lower edge of the body resting on the forming rolls is curled or turned inwardly by the roll grooves, thus effecting the false wiring as the cam follower continues up the rise of the cam. At approximately the time that the follower reaches the point B on the cam, the cap is brought into engagement with the seaming roll 71 which seams the cap onto the body as shown at 92 in Fig. 6. Whether one or more rolls 71 are used for forming the double seam 92, the seaming operation will be completed at approximately the point C on the cam and the follower will then ride down the inclined surface 100 to the point D where, through the medium of the mechanism shown in the aforementioned application, the can will be disengaged from the chuck 94 and removed from the machine as therein shown.

It will be obvious that my improved mechanism may be embodied in machines other than that shown in my pending application to which I have referred and I do not limit myself to any such construction, as it will be manifest that the invention is not limited to the details which I have selected for illustrative purposes, but is capable of embodiment in machines differing materially in their construction and mode of operation from that shown and described without departing from the essence of the invention as defined in the following claims.

I claim:

1. In a can forming machine, the combination of a movable support, means for spinning a can body on said support, means engaging one end of said body to form a false wiring, means for seaming a cap onto the other end thereof, and means for actuating said false wiring and seaming means automatically during the movement of said support.

2. In a can forming machine, the combination of a movable support, means for spinning a can body on said support, means engaging one end thereof to form a false wiring, and means for seaming a cap onto the other end thereof, said operations being completed during the continuous movement of said support.

3. In a can forming machine, the combination of a movable support, means for spinning a can body on said support, die rolls engaging one end thereof to form a false wiring, means for seaming a cap onto the other end thereof and means automatically operable by the movement of said support for causing said die rolls to form said false wiring and for causing said last mentioned means to seam said cap.

4. In a can forming machine, the combination of a movable support means for spinning a can body on said support, die rolls stationary as to the spinning movement and adapted to engage one end of said can to form a false wiring, means for double seaming a cap onto the other end thereof, and means automatically operable by the movement of said support for causing said die rolls to form said false wiring and for causing said last mentioned means to double seam said cap.

5. In a can forming machine, the combination of a movable support, means for spinning a can body on said support, means for continuously moving said support means for false wiring one end thereof, means for double seaming a cap onto the other end, and means operable during the movement of said support for causing the actuation of the last two means.

6. In a can forming machine, the combination of means for continuously advancing and simultaneously rotating a can body and a cap, means for false wiring one end of said body and double seaming the cap onto the other end thereof during such continuous travel.

7. In a can forming machine, the combination of false wiring mechanism means for continuously advancing said mechanism and a can body, and means for false wiring one end of said body during such continuous travel.

8. In a can forming machine, the combination of means for continuously advancing a can body and a cap, means for spinning said body during such advance, means engaging the lower edge of said body to false wire the same, means for double seaming the cap onto the upper end of said body and means operable during such continuous travel for actuating the last two means.

9. In a can forming machine, the combination of means for continuously advancing a can body and a cap, means for spinning said body, means for false wiring the lower edge of said body, means for elevating said body against the cap, and means for double seaming said cap onto said body during such continuous travel.

10. In a can forming machine, the combination of means for continuously advancing a can body and a cap, means for spinning said body, die rolls stationary as to the spinning movement of said can, means for pressing said body upward into engagement with said cap and for false wiring the lower edge of said body, and means for double seaming said cap onto said body during such continuous travel.

11. A false wiring mechanism comprising a movable can body support, means for spinning said body on said support, means for elevating said body into a squeezing engagement, and means carried by said support for false wiring the lower edge of said body during said squeezing engagement all of said means being operable during the movement of said support.

12. A false wiring mechanism comprising a movable can body support, means for spinning said body on said support, means for elevating said body into a squeezing engagement, and die rolls carried by said support for false wiring the lower edge of said body during said squeezing engagement all of said means being operable during the movement of said support.

13. A false wiring mechanism comprising a movable can body support, means for spinning said body on said support, means for elevating said body into a squeezing engagement, and die rolls stationary as to the spinning movement of said body and carried by said support for false wiring the lower edge of said body during said squeezing engagement said elevating means being automatically operable by the movement of said support.

14. In a can forming machine, the combination of a continuously traveling can body support, means for rotating a can body upon said support, means for elevating said support, and means carried by the support for false wiring an end of said body during the elevation of the support.

15. In a can forming machine, the combination of a continuously traveling can body support, means for rotating a can body upon said support, means for elevating said support, and yieldable means on said support engaging with and false wiring one end of said body during the elevation of said support.

16. In a can forming machine, the combination of a continuously traveling can body support, means for rotating a can body upon said support, means for elevating said support, and die rolls carried by the support for false wiring an end of said body during the elevation of the support.

17. In a can forming machine, the combination of a continuously traveling can body support, means for rotating a can body upon said support, means for elevating said support, and yieldable die rolls on said support engaging with and false wiring an end of said body during the elevation of said support.

18. In a can forming machine, the combination of a continuously traveling can body support, means for rotating a can body upon said support, means for elevating said support, a die block in said support carrying means for false wiring one end of said body during the elevation of said support, and means for maintaining uniform pressure of said last named means during the false wiring operation.

19. In a can forming machine, the combination of a continuously traveling can body support, means for rotating a can body upon said support, means for elevating said support, means on said support engaging with and false wiring one end of said body during the elevation of said support, and means providing yieldability to said last named means to compensate for the elevation of said body faster than its decrease in height.

20. In a can forming machine, the combination of a continuously traveling can body support, means for rotating a can body upon said support, means for elevating said support, die rolls on said support engaging with and false wiring one end of said body during the elevation of said support, and means providing yieldability to said die rolls to compensate for the elevation of said body faster than its decrease in length.

21. In a can forming machine, the combination of a continuously traveling can body support, means for rotating a can body upon said support, means for elevating said support, a die block on said support having a plurality of die rolls for false wiring one end of said body during the elevation of said support, and means providing yieldability between said die block and said support to compensate for the elevation of said body faster than its decrease in length.

22. In a can forming machine, the combination of a continuously moving member,

can body supports on said member, the upper surfaces of which are normally contiguous to said member, means for rotating a can body on each of said supports, means for successively elevating said supports, means on said supports for engaging with and false wiring one end of said body during the elevation of said supports, and means providing yieldability to said last named means to compensate for the elevation of said body faster than its decrease in length.

23. In a can forming machine, the combination of a continuously moving member, can body supports on said member, the upper surfaces of which are normally contiguous to the upper surface of said member, means for rotating a can body on each of said supports, means for successively elevating said supports, a die block in each support, die rolls in said blocks for false wiring one end of said body during the elevation of said supports, and yieldable means between said die block and said support to compensate for the elevation of said body faster than its decrease in length.

24. In a can forming machine, the combination of a continuously moving member, can body supports on said member the upper surfaces of which are normally contiguous with the upper surface of said member, means for rotating a can body on each of said supports, a cam for successively elevating said supports, a die block in each support, a plurality of die rolls in said blocks for false wiring one end of said body during the elevation of said supports, and yieldable means between said die block and said support to compensate for the elevation of said body faster than its decrease in length.

25. In a can forming machine, the combination of a continuously moving member, can body supports on said member the upper surfaces of which are normally contiguous with the upper surface of said member, means for rotating a can body on each of said supports, a die block in each support, a plurality of die rolls in each support, a cam follower on each of said supports, a cam engaging said followers to successively elevate said supports whereby the die rolls engage one end of said body and false wire same, and means between said die blocks and said supports for permitting a slower elevation of said blocks than said supports.

26. In a can forming machine, the combination of a non-rotatable can body supporting chuck provided with a false wiring device, means for continuously moving said chuck and a can body supported thereon, means for revolving the can body during such movement to effect the false wiring, and means for double seaming the opposite end of the can body during such movement.

27. In a can body forming machine, the combination of means for continuously advancing and simultaneously rotating a can body, false wiring mechanism movable with said body to perform the false wiring operation during the rotation of the body, and means past which said body travels for double seaming a cap to said body.

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