

Aug. 14, 1923.

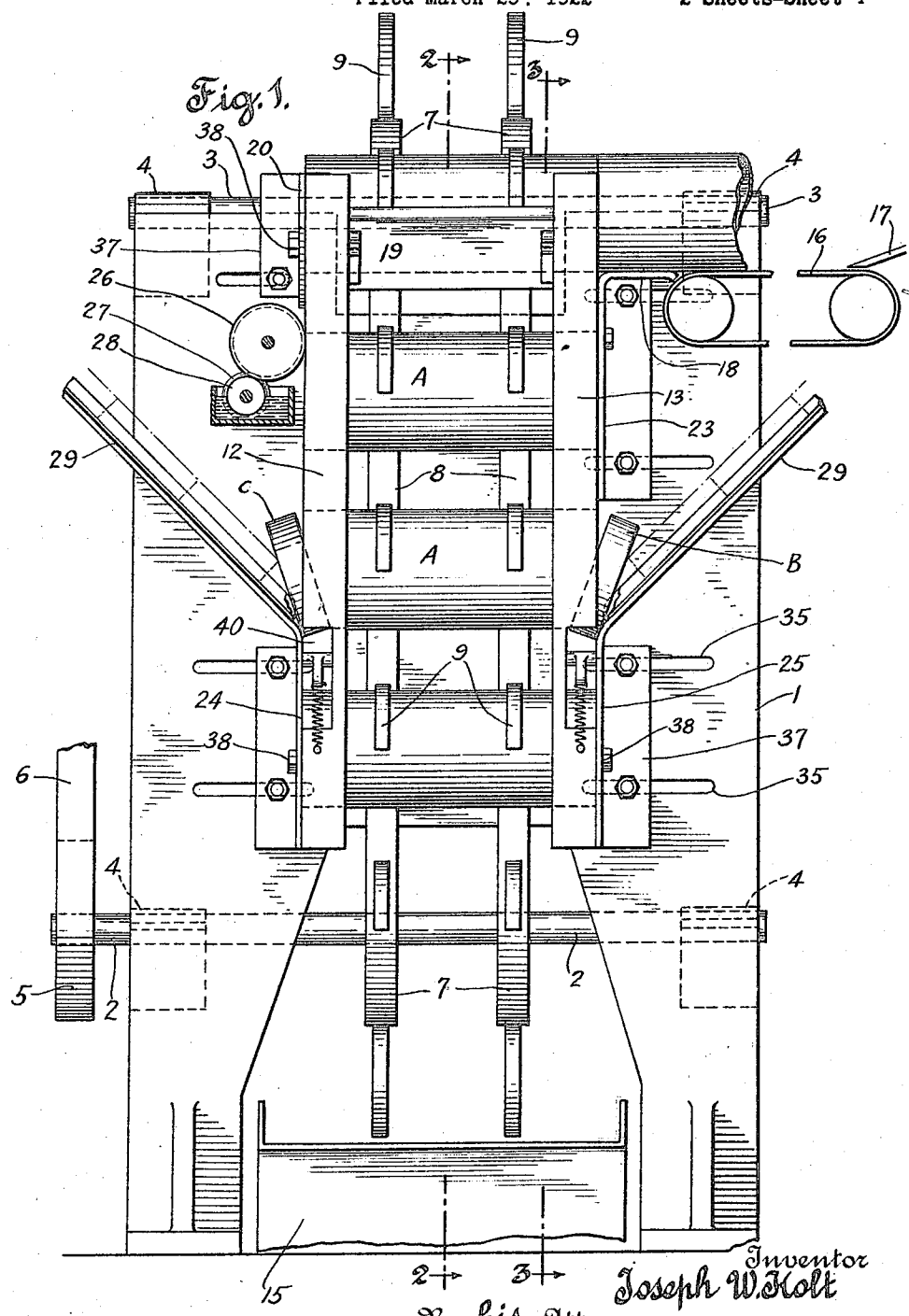
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J. W. HOLT

PAPER CAN CAPPING MACHINE

Filed March 29, 1922

2 Sheets-Sheet 1



Inventor
Joseph W. Holt
By his Attorney
Wallace White

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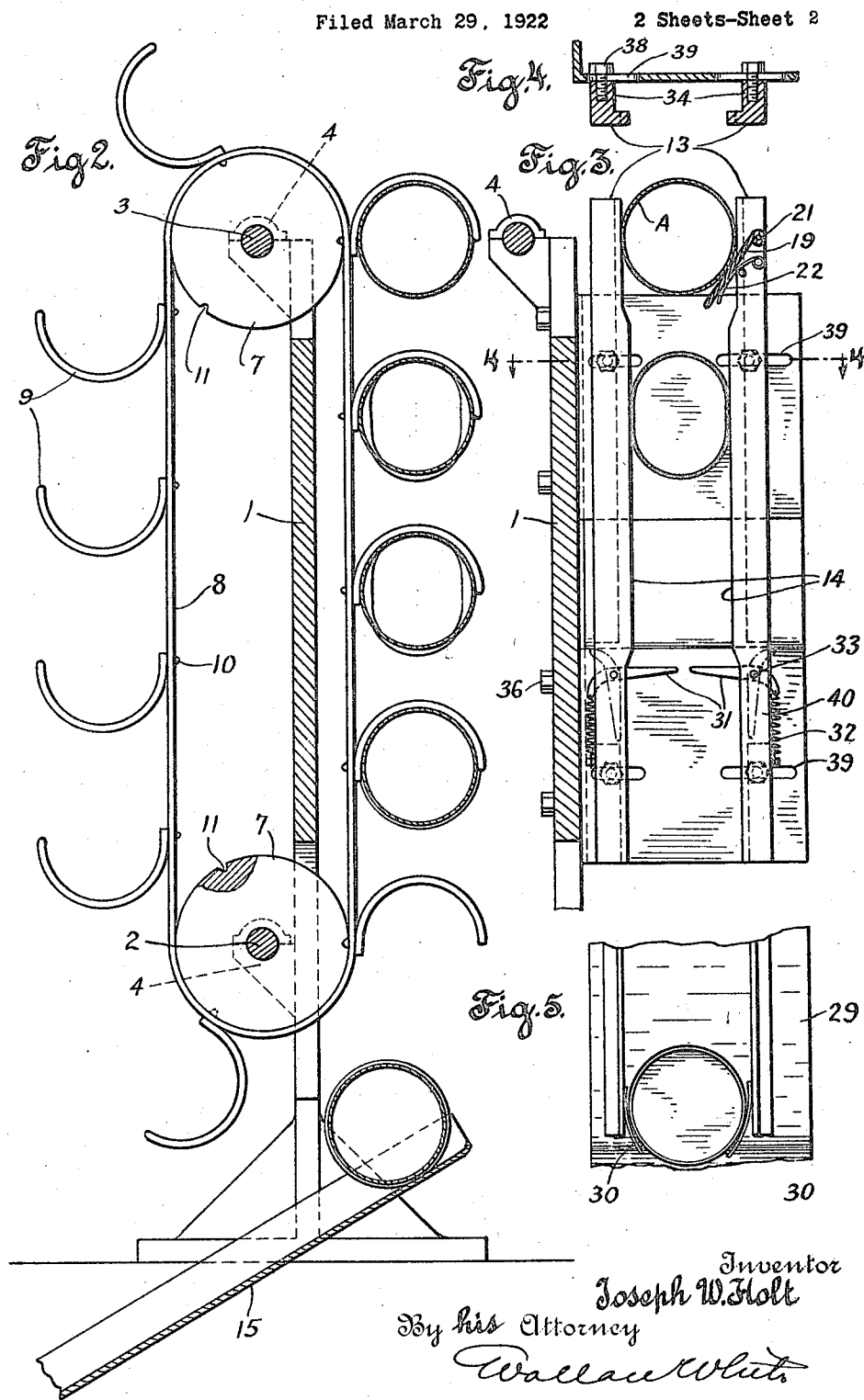
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UNITED STATES PATENT OFFICE.

JOSEPH W. HOLT, OF BROOKLYN, NEW YORK, ASSIGNOR TO UNION PAPER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

PAPER-CAN-CAPPING MACHINE.

Application filed March 29, 1922. Serial No. 547,714.

To all whom it may concern:

Be it known that I, JOSEPH W. HOLT, a citizen of the United States of America, residing at 1644 St. Marks Avenue, Brooklyn, New York, have invented new and useful Improvements in Paper-Can-Capping Machines, of which the following is a specification.

My invention relates to machinery for the making of paper cans and the like and has for its principal object the provision of mechanism for applying the caps or heads to the can bodies. More particularly the objects of my invention are the provision of means for propelling the can bodies between guides, keeping them moving continuously and at a substantially uniform rate, and applying the caps to the bodies during their passage between said guides; the provision of means associated with said guides to distort the can bodies and caps while the caps are being applied, in substantially the same manner that bodies and caps are distorted when the application of the caps is made by hand; the provision of means for automatically feeding the can bodies and caps to the mechanism, and discharging the cans with the caps applied; the provision of means for applying adhesive material to one or both ends of the can bodies prior to the engagement of the caps with the can bodies; the provision of means for pressing the caps home after they have been applied to the can bodies; the provision of means for adjusting the several parts of the mechanism to accommodate different diameters and lengths of cans; the provision of means for preventing more than one cap from being applied on the end of a can; and such other objects as are disclosed in the course of the following description.

My invention thus consists in the constructions, combinations and arrangements of parts herein described and claimed and illustrated in the accompanying drawings.

In these drawings, which illustrate a preferred embodiment of the invention, and in which similar reference characters designate corresponding parts in all views,

Figure 1 is a front elevation of a machine embodying the invention;

Fig. 2 is a vertical section taken approximately on the line 2—2 of Fig. 1, looking in the direction of the arrows, showing the conveying or propelling mechanism;

Fig. 3 is a vertical partial section taken approximately on the line 3—3 of Fig. 1, looking in the direction of the arrows, showing the guiding mechanism;

Fig. 4 is a horizontal section through the guides taken approximately on the line 4—4 of Fig. 3; and,

Fig. 5 is a detail of the guides or chutes for delivering the caps into the path of the can bodies.

Referring to these drawings, I provide a frame 1, the shape of which is immaterial, which serves as a support for the conveying and guiding mechanisms.

The conveying mechanism comprises preferably a pair of shafts 2, 3 suitably mounted in bearings 4 carried by the frame 1, the shaft 3 being preferably arranged vertically above the shaft 2 and parallel therewith, and the shaft 2 being provided with means to drive it, such as the driven pulley 5 and a suitable driving belt 6 connected with a source of power. Mounted upon the shafts 2, 3 are operating pulleys 7 having one or more continuous conveyor belts 8 passing over the pulleys and provided with hooks 9 adapted to engage the can bodies and convey them through the guiding mechanism. In order that the conveyor belts, if more than one is used, may travel synchronously, means are preferably provided to prevent slippage of the belts, such as the pins 10 arranged to cooperate with the corresponding depressions 11 in the operating pulleys 7, which pins 10 may if desired form a part of the means for securing the hooks 9 to the belts 8.

The guiding mechanism comprises preferably two pairs of main guides 12 and 13 together with a number of end guides associated with the main guides at appropriate points, and several supplementary guides. These main guides are suitably supported on the frame in position parallel to the path of travel of the conveying belts 8, and so spaced that the can bodies propelled by the hooks 9 of the conveyor belts 8 pass between the guides of each pair 12, 13.

In the drawings the cans, or more specifically the can bodies are designated A, the top caps B, and the bottom caps C; and the pairs of guides 12, 13 are spaced from each other approximately the length of a can body A, so that the guides operate upon the can bodies near their ends.

Referring to Figure 3, it will be noted that the guides of each pair of main guides, the pair 13 being illustrated, are spaced apart at the top, and at the bottom, a distance sufficient to permit of the insertion of a can body therebetween; and the intermediate portions of said guides have inwardly projecting portions 14 forming a restricted passage for the can bodies. Thus as the can bodies pass between these guides they are distorted from their normal shape, circular in section, to a shape approximately elliptical in section; and after the can bodies have passed the restricted portion formed by the inward projections of the guides 14, during which period the caps are applied, the cans are allowed to resume their normal shape having circular section, whereupon they are discharged from the guides, falling upon suitable receiving apparatus such as the chute 15.

The can bodies are preferably introduced between the guides 12, 13 and in the path of the hooks 9 of the conveying apparatus by means of a continuous conveyor belt 16 upon which the can bodies are received from a chute 17, the can bodies being advanced over a suitable guide plate 18 between the guides 13, and supported upon a yieldable guide plate 19 until the advancing end of the can passes between the guides 12 and strikes against an end guide plate 20, thus determining the position of the can body with respect to the guides 12, 13 and the conveying mechanism.

The yieldable guide plate 19 is preferably supported on pivots 21 mounted upon the forward guide members 12, 13 of each pair, this plate being held, as by springs 22, normally in the position shown in Fig. 3, thus supporting the can body A until it is in place between the guide and against the end plate 20, the plate 19 being capable of being moved on its pivots by the can body and the conveyor hooks 9 out of the path of the can body as the can body is drawn downwards, and being returned to the position shown by the springs 22 after it is released by the passage of a can body, so as to furnish the same support to the succeeding can body until it is in place for engagement by the hooks of the conveyor mechanism.

As the can body is drawn downward between the pairs of guides 12, 13, its axial position may be insured by the use of guides 23, 24, 25; and in case it is desired to apply one or both of the caps to the end of the can body A, as the cap C to form the bottom of the can, so as to secure it adhesively thereto, mechanism for applying adhesive to the end of the can body may be provided, such as the roller 26 to which adhesive is supplied by means of a supplemental roller 27 partially immersed in a pot of adhesive

material 28. The roller 26 is preferably provided with a concave surface, in order that the adhesive may be evenly distributed upon the end of the can body, the cooperating roller 27 having a corresponding convex surface.

The caps are applied to the can bodies A after the can body has been distorted by the portions 14 of the guides 12, 13, the caps B, C being introduced into the path of the can bodies A by suitable means such as the inclined guides or chutes 29. The caps may be fed under the influence of gravity, sliding down the chutes 29 until they project into the path of the can bodies A, being preferably held from further advance by means such as the restraining spring fingers 30, shown in Fig. 5, which are yieldable to permit of the caps being drawn past them when they are engaged by a can body A.

The entire caps B, C are not susceptible of being distorted to an elliptical shape, because of their flat base and for this reason the main guides 12, 13 are formed as shown in Fig. 4 with a recessed portion 34 to accommodate the base of the cap.

As soon as the caps have been engaged by the can bodies and drawn forward, they are acted upon by means such as the fingers 31, located in recesses 40 of the guides 12, 13, and normally held in the position shown in full lines in Fig. 3 by means such as the springs 32, the fingers being mounted upon pivots 33. These means exert through the fingers a retarding pressure upon the edges of the caps as they are drawn through by the passage of the can bodies, thus tending to work the edges of the caps around the can bodies and ensure the passing of the entire edge of the cap over the end of the can body. As the cans are drawn through, the fingers take the position shown in dot and dash lines in Fig. 3, and after the passage of a can, under the influence of the springs, resume the full line position to engage the succeeding can and caps.

After the caps have been introduced into the path of the can bodies A by means of the chute 29, as the bodies are drawn further between the guides 12, 13, the caps are forced firmly into place by the end guide plates 24, 25, the cans resuming their cylindrical shape as the caps are applied and they pass from the portions 14 of the main guides.

In order that one machine may be useful for applying caps to cans of different diameters and lengths, the guides are preferably made relatively adjustable. As a convenient way of accomplishing this, I have shown the frame as embodying a flat plate provided with a number of slots 35. Bolts 36 are slidably arranged in these slots, and engage the several end guides 20, 23, 24, 25, which may be formed with flanges 37 at

right angles to the main portion of the guides, so that when these flanges are clamped against the frame 1 by the bolts 36, the end guides are held in position at right angles to the flat surface, and by varying the positions of the bolts in the slots the end guides may be spaced to accommodate cans of different lengths. The main guides 12, 13 are then similarly supported by the end guides through bolts 38 engaging similar slots 39 in the end guides, and their positions may be similarly varied to accommodate cans of different diameters. If desired, the belts 8 carrying the hooks 9 may be changed for belts having larger or smaller hooks, and the pulleys 7 may be changed for different sizes to vary the path of the cans.

The operation of the machine, although already indicated, may be summarized as follows:

A supply of caps is placed upon each of the chutes 29, open ends up, the first cap taking the position shown in Fig. 5 against the restraining fingers 30, and succeeding caps arranged in line as indicated in dot and dash lines, Fig. 1, each held back by the preceding cap.

Can bodies are delivered preferably from the mechanism for forming the tubes and cutting them to size by the chute 17 to the belt 16 which advances the can to its position between the guides 12, 13. As shown in Fig. 2, while the hooks are passing around the pulleys 7 there is a very material space between the hooks, which permits of the insertion of a can body between the guides 12, 13 without interference from the hooks. The belts 8 are driven continuously, and consequently the hooks engage the can body A and draw it down through the guides 12, 13, adhesive being applied by the roll 26 if desired. As the can body engages the projecting portion 14 of the guides 12, 13, the section of the can body is transformed from substantially circular to substantially elliptical, so that at the time the can body engages the caps B, C held in position for it by the restraining fingers 30, it has a substantially elliptical shape, and advancing in line with its major axis the entrance to the cap is made by the acute end of the ellipse, so that the greater portion of the end of the can is inserted into the cap before there is any frictional resistance from the edge of the cap. As the can body with the cap partially on is carried forward, the fingers 31 engage the edges of the cap, and hold the parts of the cap that have already been applied to the can body closely in place, so as to make the entrance of the last edge of the can body into the cap an easy matter. As the can bodies with the caps applied pass on further, the end guides 24, 25 press the caps completely home upon the can bodies,

which then drop from the guides and the conveying mechanism into a suitable container, for instance a chute 15 which delivers the finished cans where they are required.

Having now described my invention, I claim and desire to secure by Letters Patent of the United States:

1. A machine for capping paper cans comprising guides adapted to distort the cans to approximately elliptical section during passage therebetween, means for conveying the cans between said guides, and means for applying the caps to the cans while distorted.

2. A machine for capping paper cans comprising guides adapted to distort the cans to approximately elliptical section during passage therebetween, means for conveying the cans between said guides, and means for introducing the caps into the path of the cans during passage between said guides.

3. A machine for capping paper cans comprising guides adapted to distort the cans to approximately elliptical section during passage therebetween, means for conveying the cans between said guides, means for introducing the caps into the path of the cans during passage between said guides, and members associated with said guides for exerting end pressure upon the capped cans to press the caps home.

4. A machine for capping paper cans comprising guides adapted to distort the cans to approximately elliptical section during passage therebetween, means for conveying the cans between said guides, means for introducing the caps into the path of the cans during passage between said guides, and means operative on the sides of the caps during application to the cans for distorting the edge of the cap to correspond with the shape of the can.

5. A machine for capping paper cans comprising guides adapted to distort the cans to approximately elliptical section during passage therebetween, means for conveying the cans between said guides, means for introducing the caps into the path of the cans during passage between said guides, and means to restrain the caps until preceding caps have been applied.

6. A machine for capping paper cans comprising approximately parallel guides, means for delivering paper cans between said guides, means for engaging and conveying said cans along between said guides, said guides having a contracted portion adapted to distort the cans to approximately elliptical shape, and means for applying the caps to the cans while distorted.

7. A machine for capping paper cans comprising approximately parallel guides, means for delivering the cans between said guides, a stop to hold a can longitudinally in position between said guides, means for engag-

ing and conveying said cans along between said guides, said guides having a contracted portion adapted to distort the cans to approximately elliptical shape, and means for applying the caps to the cans while distorted.

8. A machine for capping paper cans comprising approximately parallel guides, mechanism including a continuous, moving belt for advancing the cans to position between said guides, a stop to hold a can longitudinally in position between said guides, means for engaging and conveying said cans along between said guides, said guides having a contracted portion adapted to distort the cans to approximately elliptical shape, and means for applying the caps to the cans while distorted.

9. A machine for capping paper cans comprising approximately parallel guides, means for delivering paper cans between said guides, means for temporarily supporting said cans in position between said guides, means for engaging and conveying said cans along between said guides, said guides having a contracted portion adapted to distort the cans to approximately elliptical shape, and means for applying the caps to the cans while distorted.

10. A machine for capping paper cans comprising approximately parallel guides, means for delivering paper cans between said guides, a yieldable spring-pressed plate for temporarily supporting said cans in position between said guides, means for engaging and conveying said cans past said yieldable plate and along between said guides, said guides having a contracted portion adapted to distort the cans to approximately elliptical shape, and means for applying the caps to the cans while distorted.

11. A machine for capping paper cans comprising guides adapted to distort the cans to approximately elliptical section during passage therethrough, driven endless belts associated with said guides, hooks carried by said belts and adapted to engage the cans and convey them between said guides, and means for applying the caps to the cans while distorted.

12. A machine for capping paper cans comprising guides adapted to distort the cans to approximately elliptical section during passage therethrough, driven endless belts associated with said guides, means for causing said belts to move in unison, hooks carried by said belts and adapted to engage the cans and convey them between said guides, and means for applying the caps to the cans while distorted.

13. A machine for capping paper cans comprising guides adapted to distort the cans to approximately elliptical section during passage therebetween, means for convey-

ing the cans between said guides, means for applying adhesive to at least one end of the cans, and means for applying the caps to the cans while distorted.

14. A machine for capping paper cans comprising guides adapted to distort the cans to approximately elliptical section during passage therebetween, means for conveying the cans between said guides, and inclined chutes for introducing the caps into the path of the cans during passage between said guides.

15. A machine for capping paper cans comprising guides adapted to distort the cans to approximately elliptical section during passage therebetween, means for conveying the cans between said guides, inclined chutes for introducing the caps into the path of the cans during passage between said guides, and means to prevent further movement of the caps until engaged by the cans.

16. A machine for capping paper cans comprising guides adapted to distort the cans to approximately elliptical section during passage therebetween, means for conveying the cans between said guides, inclined chutes for introducing the caps into the path of the cans during passage between said guides, means to prevent further movement of the caps until engaged by the cans, and end plates associated with said guides to apply pressure to the caps when engaged and drawn forward by the cans.

17. A machine for capping paper cans comprising guides adapted to distort the cans to approximately elliptical section during passage therebetween, means for conveying the cans between said guides, inclined chutes for introducing the caps into the path of the cans during passage between said guides, end plates associated with said guides to apply pressure to the caps when engaged and drawn forward by the cans, and mechanism for shaping the caps as they are forced into place by said end plates.

18. A machine for capping paper cans comprising guides adapted to distort the cans to approximately elliptical section during passage therebetween, means for conveying the cans between said guides, inclined chutes for introducing the caps into the path of the cans during passage between said guides, end plates associated with said guides to apply pressure to the caps when engaged and drawn forward by the cans, and spring-pressed fingers arranged to compress the caps to conform to the shape of the cans as they are forced into place by said end plates.

19. A machine for capping paper cans comprising guides adapted to distort the cans to approximately elliptical section during passage therebetween, means for conveying the cans between said guides, means

for applying the caps to the cans while distorted, and means for adjusting the guides to accommodate cans of different diameters.

20. A machine for capping paper cans comprising guides adapted to distort the cans to approximately elliptical section during passage therebetween, means for conveying the cans between said guides, means for applying the caps to the cans while distorted, and means for adjusting the guides to accommodate cans of different lengths.

21. A machine for capping paper cans comprising guides adapted to distort the cans to approximately elliptical section during passage therebetween, means for conveying the cans between said guides, means for applying the caps to the cans while distorted, and means for adjusting the guides to accommodate cans of different diameters and lengths.

22. A machine for capping paper cans comprising guides adapted to distort the cans to approximately elliptical section during passage therebetween, means for conveying the cans between said guides, and means for applying the caps to the cans while distorted, said guides having portions adapted to act on said cans near but not at the ends of the cans to effect distortion, and recessed portions at the sides of the ends of the cans to avoid distortion of the heads of the caps.

23. A machine for capping paper cans comprising guides adapted to distort the cans to approximately elliptical section during passage therebetween, means for conveying the cans between said guides, means for introducing the caps into the path of the cans during passage between said guides, fingers pivotally mounted on said guides and normally held yielding across the line of movement of the cans, said fingers being mounted to be displaced into line with the guides by the advancing can.

24. A machine for capping paper cans comprising guides adapted to distort the cans to approximately elliptical section during passage therebetween, means for conveying the cans between said guides, means for introducing the caps into the path of the cans during passage between said guides, and spring fingers to maintain a cap in position until engaged by a can.

25. A machine for capping paper cans comprising guides adapted to distort the cans to approximately elliptical section during passage therebetween, means for conveying the cans between said guides, a concave roller for applying adhesive to at least one end of the cans, and means for applying the caps to the cans while distorted.

26. A machine for capping paper cans comprising guides adapted to distort the cans to approximately elliptical section during passage therebetween, means for conveying the cans between said guides in a direction at right angles to their axes, and means for applying the caps to the cans while distorted.

27. A machine for capping paper cans comprising guides adapted to distort the cans to approximately elliptical section during passage therebetween, means for conveying the cans between said guides in a direction at right angles to their axes and in line with the major axis of the ellipse, and means for applying the caps to the cans while distorted.

28. A machine for capping paper cans comprising means for distorting the cans to approximately elliptical section, and means operating upon the exterior of the caps for similarly distorting their edges and angularly applying the caps.

In testimony whereof I have signed my name to this specification.

JOSEPH W. HOLT.