Aug. 28, 1945. A. A. SAALBACH 2,383,513

CAN CLOSING MACHINE

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Fig 2

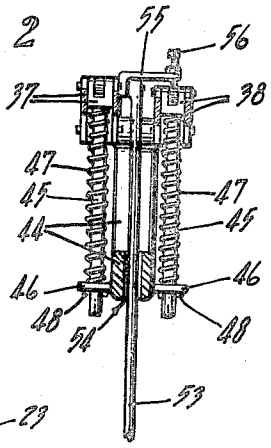


Fig 1

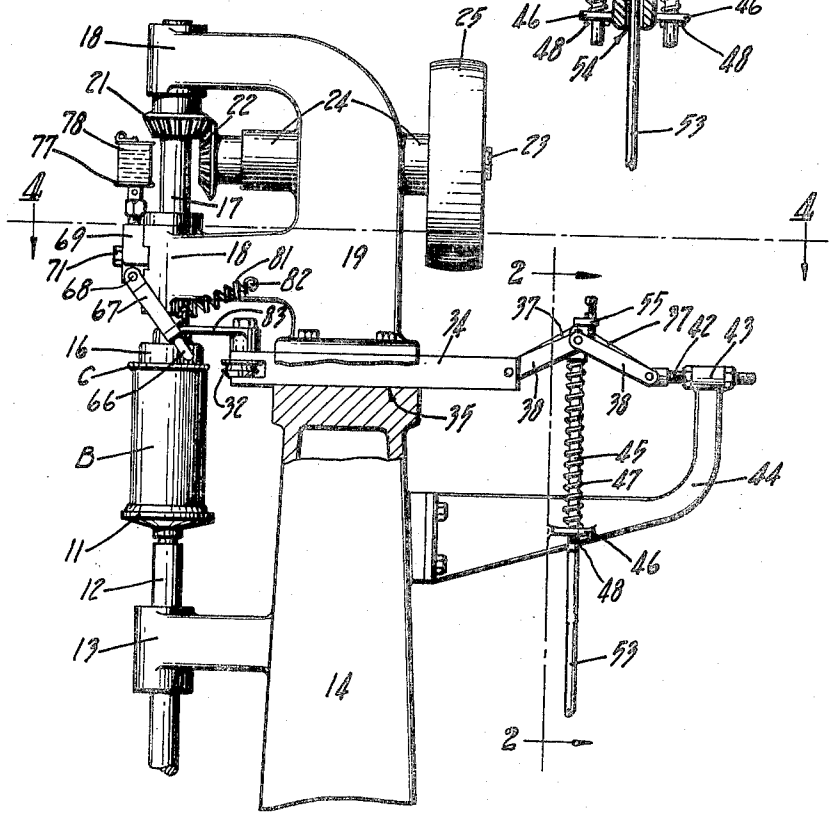
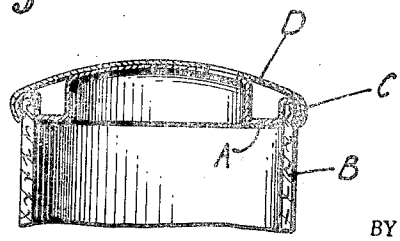


Fig 3



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Fig 4

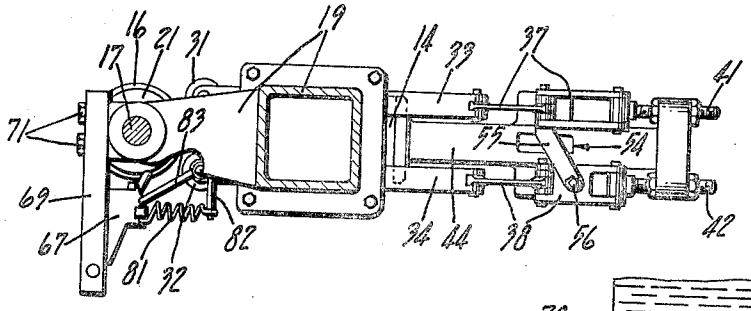
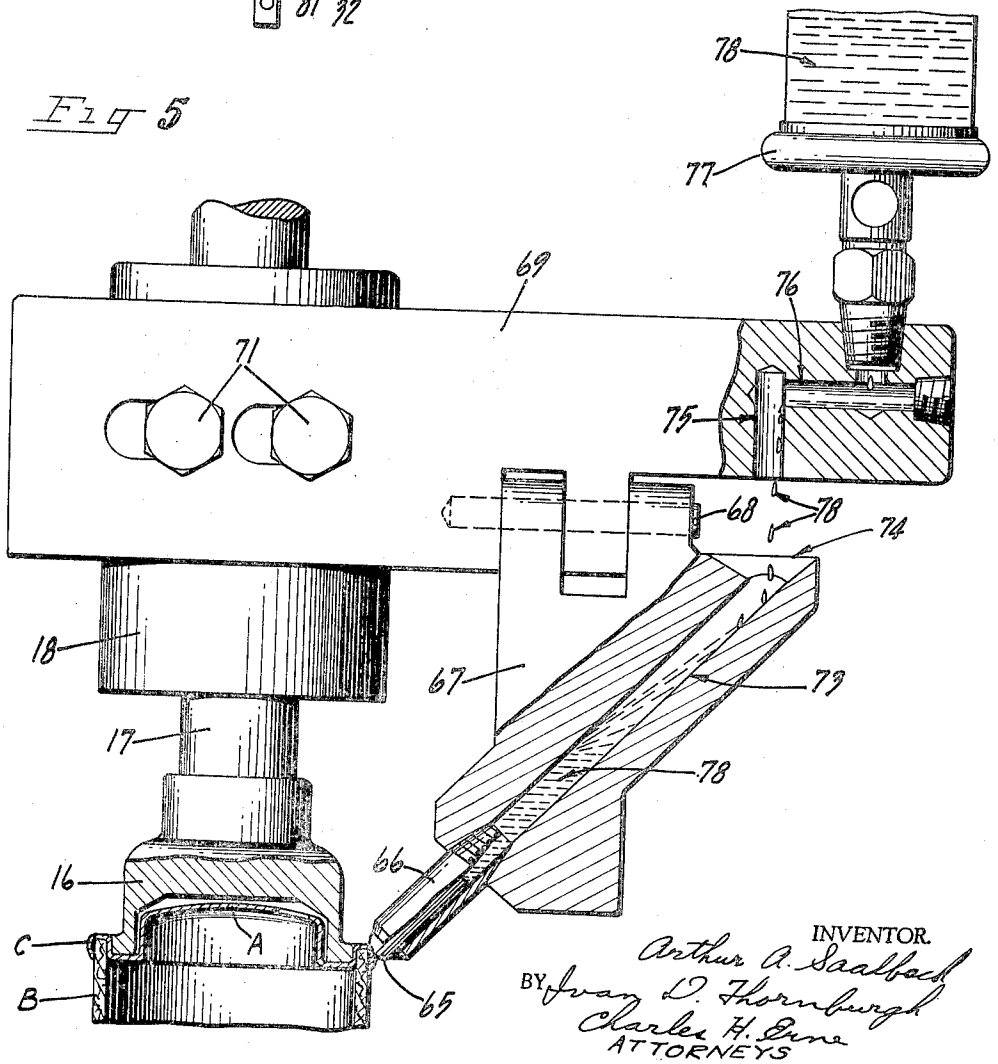


Fig 5



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UNITED STATES PATENT OFFICE

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CAN CLOSING MACHINE

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Application September 3, 1942, Serial No. 457,211

2 Claims. (Cl. 113—23)

The present invention relates to can closing machines for seaming sheet metal end members onto containers or cans adapted to receive a rotatable cover and has particular reference to applying lubricant to the can end seam during its formation to facilitate free rotation of the cover when it is subsequently applied to the can.

In the manufacture of some sifter top cans, such as used for powders and the like materials, the rotatable cover or cap member is crimped in place over an end seam of the can. These covers are usually made from a zinc base material which permits of easy sliding or rotating operation on the end seam of the can. With the scarcity of zinc base materials due to their use in war production, other materials such as tin plate and black iron plate have had to be substituted to make these covers.

Numerous difficulties have been encountered in the use of tin plate and black iron plate for these covers, in that such materials are considerably harder and stiffer than the zinc base materials and this tends toward a variation in fit between the covers and the end seams over which they are applied. Such variation in fit sometimes creates considerable friction between the cover and the end seam and thus prevents proper rotation of the cover. Furthermore, tin plate and black iron plate materials sometimes rust and this also holds the cover against free rotation on the can.

The present invention contemplates overcoming these difficulties by providing a device which applies a lubricant to the end seam of the can as the seam is being formed so that the cover when subsequently crimped in place on the seam will rotate freely.

An object therefore, of the invention is the provision in a can closing machine of a lubricating device which operates to deposit a thin film of lubricant onto the end seam of a sifter top can as the seam is being made, to reduce friction between a metal cover subsequently applied over the end seam and to thereby provide for free rotation of the cover on the can.

Another object is the provision of such a lubricating device which is simple in construction and operation and which operates in conjunction with the forming of the end seam in the usual type of can closing machine so that the lubricant willl be applied to the seam simultaneously with or at least as a unit part of the seam forming operation.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Figure 1 is a side view of the upper portion of a can closing machine embodying the instant invention, with parts broken away and parts shown in section;

Fig. 2 is a transverse sectional detail taken substantially along the vertical line 2—2 in Fig. 1, with parts broken away;

Fig. 3 is an enlarged vertical sectional view of the upper end of one form of a container having a rotatable cover applied to an end seam which is lubricated by the device of the instant invention;

Fig. 4 is a horizontal section taken substantially along the line 4—4 in Fig. 1; and

Fig. 5 is an enlarged front view of the lubricating device and the can closing head of the machine shown in Fig. 1 as viewed from the left in that figure with a can in place in the machine, parts of the device, the head, and the can being shown in section and other parts being broken away.

As a preferred embodiment of the instant invention the drawings illustrate principal parts of a can closing machine of the character disclosed in United States Patent 1,173,329, issued February 29, 1916, to L. N. Trudeau, on Can crimping machine. The machine is used for seaming metal sifter top can ends A (Fig. 3) to fibre can bodies B in suitable end seams C produced by turning inwardly or interfolding flange parts on the can ends alone or on both the can ends and the bodies. During this seaming operation according to the present invention, a lubricant is applied to the outer surface of the end seam.

After such a seaming operation a rotatable perforated cover D may be crimped in place over the lubricated end seam, as shown in Fig. 3. This produces a sifter can of the character disclosed in United States Patent Number 1,203,872, issued November 7, 1916, to J. R. Harbeck on Dredging can.

The machine illustrated in the drawings for uniting a can end A with a body B includes a lifter pad 11 (Fig. 1) upon which the body is

placed in a vertical position after receiving the can end loosely superimposed thereon. The lifter pad is rotatably mounted on the upper end of a vertical actuating rod 12 which slides in a bearing 13 formed on a column 14 which constitutes the main frame of the machine. Vertical movement of the lifter pad may be obtained in any suitable manner, preferably by a means of connecting foot treadle as disclosed in the above mentioned Trudeau patent.

When the lifter rod 12 is shifted upwardly, the lifter pad 11 carries the can end A and the body B up into tight clamping engagement against a rotating chuck 16. This seats the work for a seaming operation. The chuck is disposed above and in vertical alignment with the lifter pad and is secured to the lower end of a rotating vertical chuck shaft 17. The chuck shaft rotates in a pair of spaced bearings 18 formed in a head bracket 19 secured to the top of the frame column 14.

The chuck shaft 17 is driven by a bevel gear 21 which meshes with and is driven by a cooperating bevel gear 22 mounted on the inner end of a horizontal drive shaft 23 journaled in bearings 24 formed in the head bracket 19. The drive shaft is rotated preferably by a belt pulley 25 which is mounted on the outer end of the shaft. Rotation of the chuck 16 through this bevel gear connection with the pulley 25, rotates the can end A and the can body B clamped against it by the lifter pad 11. It is during this rotation of the can that the seaming operation is performed.

The seaming operation is performed by a pair of seaming rollers, a first operation roller 31 (Fig. 4) and a second operation roller 32. The rollers are disposed adjacent the lower end of the chuck 16 in line with the flange on the can end A clamped against the chuck. These rollers are carried on the inner ends of a pair of spaced and parallel horizontal holders or slide bars 33, 34, respectively, that operate in slide grooves 35 (see Fig. 1) formed in the top of the column 14. The slide bars are retained in their grooves by the head bracket 19.

The outer ends of the two slide bars 33, 34 are connected to respective pairs of toggle links 37, 38 which are anchored to respective adjusting screws 41, 42 secured in spaced relation in a boss 43 formed on a bracket 44 bolted to the back of the column 14. The middle joint of each pair of toggle links is pivotally connected to the upper end of a support rod 45. There is one of these rods for each pair of toggle links 37, 38 and they extend downwardly on opposite sides of the bracket 44. The lower ends of the rods project through guide lugs 46 formed on the sides of the bracket.

Each support rod 45 carries a compression spring 47 which is coiled around the rod and which is interposed between the upper end of the rod and the guide lugs 46. These springs tend to force the respective toggle links upwardly into a non-operating position and thus tend to hold the slide bars 33, 34 and the seaming rollers 31, 32 in a normal retracted position away from the can clamped against the chuck 16 (as best shown in Figs. 1 and 4). Cotter pins 48 in the lower ends of the rods limit their upward travel and prevent them from being displaced from their guide lugs by the compression springs.

The pair of toggle links 37 connecting with the first seaming operation slide bar 33 and roller 31, is connected to a long vertical actuating link 53 which extends down through an opening 54 in the bracket 44. The lower end of this link connects with the foot treadle, as shown in the Trudeau patent or it may be connected with any other suitable means for actuating the rod through vertical movement. The upper end of the actuating rod is formed with an arm 55 which overhangs the toggle links 38 connecting with the second operation slide bar 34 and its seaming roller 32. The outer end of the arm carries an adjustable operating screw 56 which normally is spaced from the top of the second operation toggle links.

Hence, when the actuating link 53 is pulled down through action of the treadle or other means, it draws down on the first operation toggle links 37 against the resistance of the spring 47 while the second operation toggle links remain stationary. This pushes the connecting slide bar 33 and its first operation seaming roller 31 forward into seaming engagement with the flange of the can end A clamped against the chuck 16. This engagement of the first operation seaming roller partially turns the can end flange inwardly against the can body B in the usual manner to perform the usual first seaming operation incident to producing the can end seam C.

As the actuating rod 53 continues to move down, however, the operating screw 56 on the arm 55 engages against the top of the second operation toggle links 38 and forces them down at the proper time against the resistance of their spring 47. This movement of the toggle links forces the second operation slide bar 34 forward toward the rotating can and thus brings its seaming roller 32 into action against the reformed can end flange to complete the end seam C. This is a usual can end seaming procedure. It is during this completion of the seam that the lubricant is applied thereto as hereinbefore mentioned and which will now be explained.

Application of the lubricant to the seam is brought about by a sponge rubber or other suitable wick 65 (Fig. 5) which is disposed in a short tube 66 threaded into a movable swing member 67. The swing member is located on the front of the machine and is hingedly connected by way of a pivot pin 68 to a horizontal support bar 69 adjustably secured by bolts 71 to the front of the chuck shaft lower bearing 18 (see also Figs. 1 and 4). The wick tube 66 is secured into the movable member preferably at an angle to approximately forty-five degrees, pointing toward the chuck 16. This tube communicates with an angularly disposed bore or well 73 formed in the member. The upper end of the bore opens into an enlarged bevel recess 74 which is located adjacent the hinge or pivot pin 68.

The well recess 74 is below and in vertical alignment with a vertical passageway 75 formed in the bottom of the support bar 69. The lower end of this passageway is open. The upper end of the passageway connects with a horizontal passageway 76 which communicates with a sight feed drip cup or reservoir 77 threaded into the top of the support bar. This reservoir contains a supply of lubricant 78, preferably a wax emulsion or the like. The lubricant in the reservoir drips down into the passageway 76, 75 and falls into the well 73 in the movable member 67 and thus maintains the wick 65 saturated.

Normally the saturated wick 65 is held away from the chuck 16 in a retracted or swung-back position, as shown in Fig. 1, by a tension spring 81, one end of which is secured to the movable member 67. The opposite end of the spring is connected to a pin 82 secured in the side of the head bracket 19 (see Fig. 4). The spring main-

tains the movable member 67 in engagement with an arm 83 bolted to the inner end of the second operation seaming roller slide 34.

Hence when the seaming roller slide bar 34, carrying the second operation seaming roller 32, moves inwardly to complete the can end seam C, the arm 83 moves with the slide bar and swings the movable member 67 and its wick 65 toward the rotating can clamped against the chuck 16. Near the end of the inward travel of the slide bar and just as the end seam C is completed or as it is in its final stages of completion, the formerly horizontally disposed can end flange has been moved or bent inwardly by the seaming roller into the path of movement of the lubricant saturated wick 65. The latter thereafter engages and wipes against the outer edge of the seam, as best shown in Fig. 3, and thus applies a thin film of the lubricant to this edge of the rotating seam in timed relation to the continued movement of the roller in completing the can end seam C. It is the applied lubricant that insures free rotation of the cover D when it is subsequently crimped in place on the can over the seam as hereinbefore explained.

After such a seam forming and lubricating operation, the seaming rollers 31, 32 and the wick 65 shift back into retracted positions away from the can so that the latter may be removed from the machine. This is effected by release of the foot treadle or other actuating means as the case may be in the usual manner.

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 all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. In a can closing machine for sealing a flanged end to a can by reshaping of the flanged end in a seam adapted to receive a rotatable cover thereover, the combination of a seaming roller having movable means for supporting the same, lubricating means movably supported on the machine adjacent the can end to be seamed, said lubricating means being normally disposed out of contact with said can end seam and movable in a predetermined path, means to move the roller into engagement with said can end flange and bend the flange inwardly into the path of movement of said lubricating means, and means on the roller supporting means to move said lubricating means along said predetermined path to lubricate the seam after the roller has bent the flange inwardly, whereby said flange is engaged by said lubricating means in timed relation to continued movement of said roller in completing the formation of said end seam, to condition the completed seam for the reception thereover of said rotatable cover.

2. In a can closing machine for sealing a flanged end to a can by reshaping the flanged end in a seam adapted to receive a rotatable cover thereover, the combination of a seaming roller having movable means for supporting the same, lubricating means movably supported on the machine adjacent the can end to be seamed, said lubricating means including a lubricant saturated wick normally disposed out of contact with the can end seam and movable in a predetermined path, means to move the roller into engagement with said can end flange and bend the flange inwardly into the path of movement of said lubricating means, and means on the roller supporting means to move said lubricating means along said predetermined path to lubricate the seam by means of said wick after the roller has bent the flange inwardly, whereby the flange is engaged and lubricated by the wick in timed relation to continued movement of said roller in completing the formation of the end seam to condition the completed seam for the reception thereover of said rotatable cover, and means for supplying lubricant to said wick.

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