R. M. HUDDLESTON.

MACHINE FOR REMOVING CAN ENDS.

APPLICATION FILED DEC. 27, 1917.

1,319,394.

Patented Oct. 21, 1919.

3 SHEETS—SHEET 1.

Fig. 1

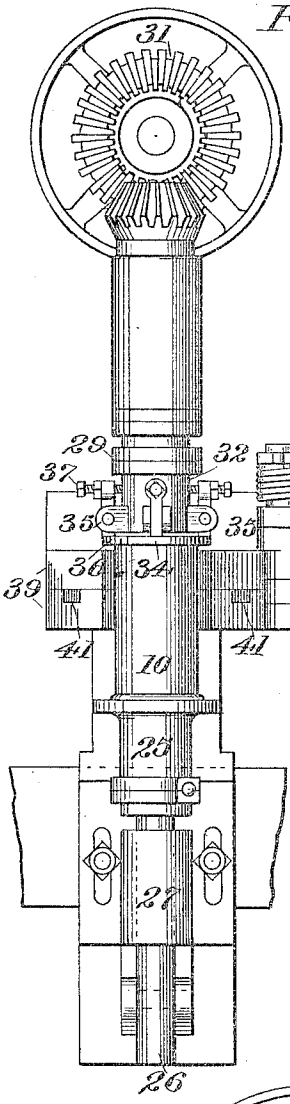


Fig. 2.

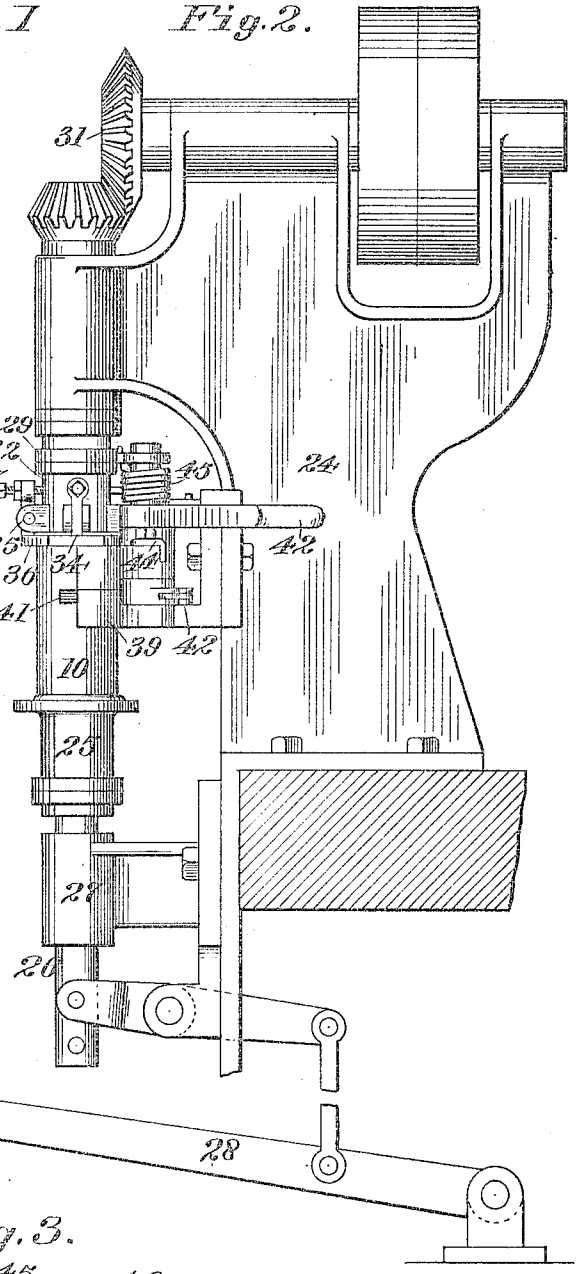
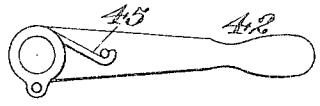


Fig. 3.



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3 SHEETS—SHEET 2.

Fig. 4

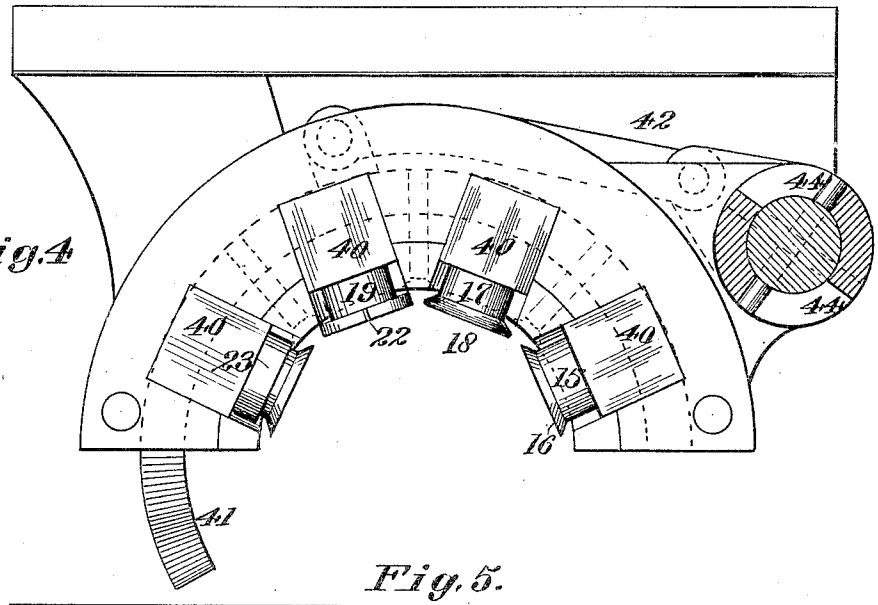


Fig. 5.

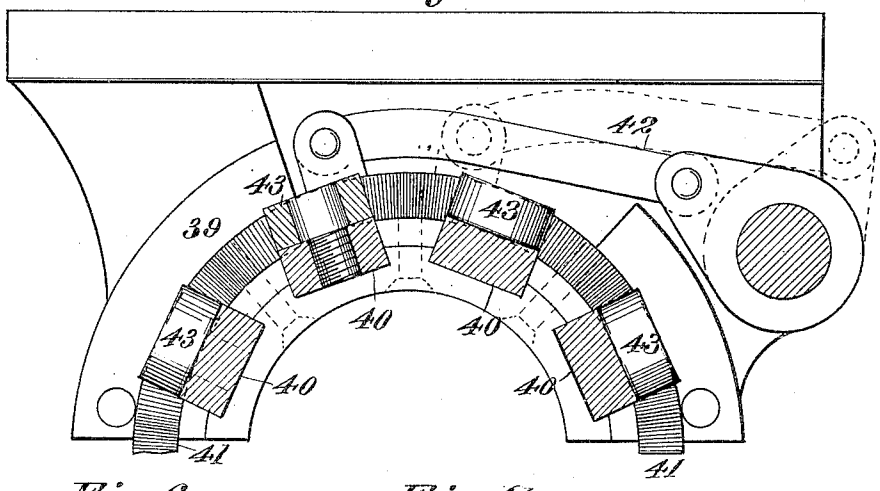


Fig. 6.

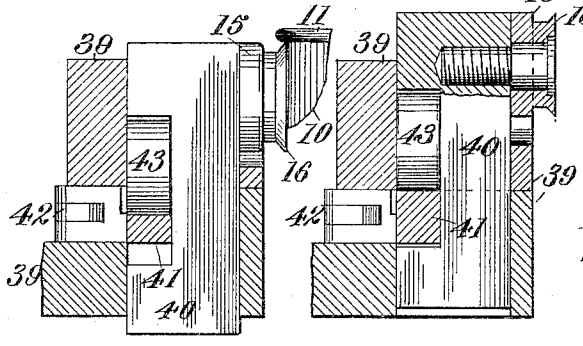


Fig. 7.

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3 SHEETS—SHEET 3.

Fig. 8.

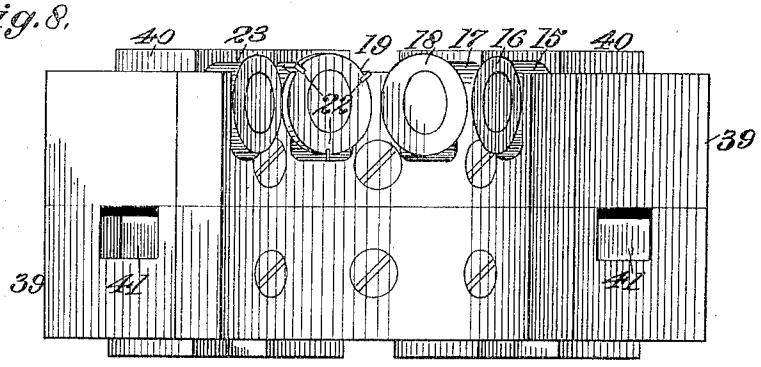


Fig. 9.

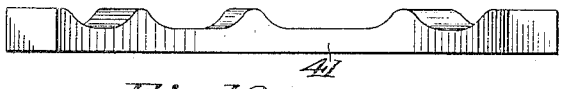


Fig. 10.

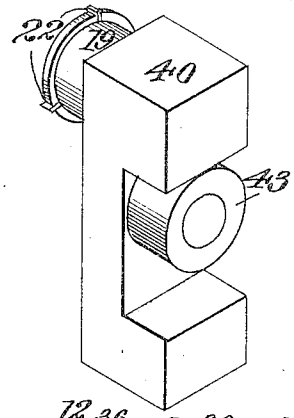


Fig. 12

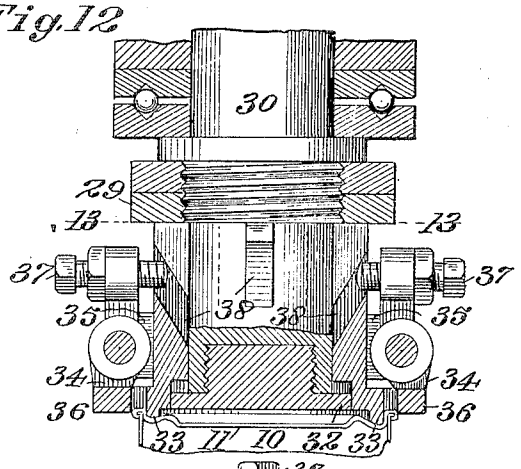


Fig. 11.

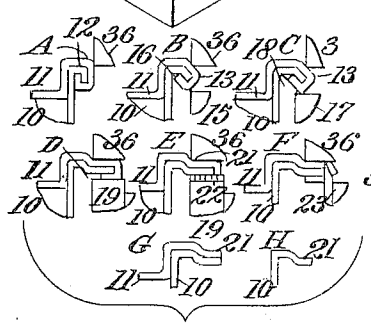


Fig. 13

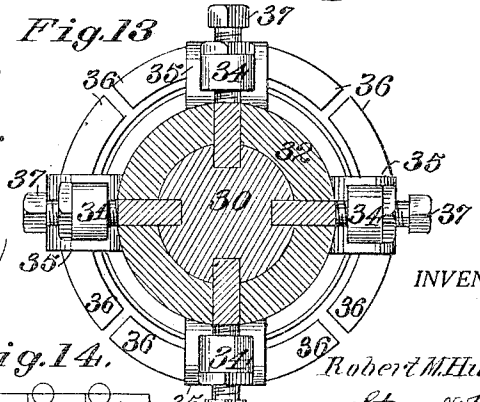
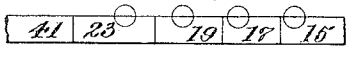


Fig. 14.



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MACHINE FOR REMOVING CAN ENDS.

1,319,394. Specification of Letters Patent. Patented Oct. 21, 1919.

Application filed December 27, 1917. Serial No. 209,074.

To all whom it may concern:

Be it known that I, ROBERT M. HUDDLESTON, a citizen of the United States, residing at the city and county of San Francisco and State of California, have invented new and useful Improvements in Machines for Removing Can Ends, of which the following is a specification.

This invention relates to a machine for removing the lock seam ends from can bodies; and has for its object to accomplish the removal of the can end in a quick and convenient manner without in any way injuring the can body, and at the same time leaving the flange on the can body in condition to receive another end.

In the filling of cans it frequently happens that it is necessary to remove the top after it is once locked and sealed in position, on account of irregularity in the weight of the contents, leakage of the end, or other causes. It is, of course, desirable that this be done without injuring the can body or unsuiting it for the reception of another top; and in the present invention I have provided a novel mechanism which accomplishes the result in a simple and facile manner.

One form which my invention may assume is exemplified in the following description and illustrated in the accompanying drawings, in which—

Figure 1 shows an end elevation of a device embodying my invention.

Fig. 2 shows a side elevation of the same.

Fig. 3 shows a detail view of the operating lever for moving the straightening and cutting rollers into engagement with the seam of the can.

Fig. 4 shows a plan view of the straightening and cutting rollers.

Fig. 5 shows a sectional view of the same.

Figs. 6 and 7 show detail views of the projectable blocks which carry the straightening and cutting rollers.

Fig. 8 shows a side elevation of the cutting and straightening rollers and operating mechanism therefor.

Fig. 9 shows a side elevation of the operating cam for the rollers.

Fig. 10 shows a perspective view of one of the projectable blocks carrying a roller.

Fig. 11 shows a diagrammatic view of various steps employed in connection with removing a can end, as carried on in my invention.

Fig. 12 shows a vertical, sectional view of the chuck which receives the can.

Fig. 13 shows a sectional view, in plan, of the same, taken on the line 13—13 of Fig. 12.

Fig. 14 shows a diagrammatic view of the cutting and straightening rollers and cam mechanism for projecting the same into operative position in proper sequence.

The present application is a division of my co-pending application Ser. No. 144,353, filed January 25th, 1917, Patent Number 1,257,285, issued February 19, 1918.

In Fig. 11 of the drawings I show the successive steps involved in the process of removing the can end. The can body is shown at 10 and the top or end at 11, the latter being held in place by a lock seam which comprises a U-shaped channel 12 on the edge of the can body, and an interlocking portion 13, on the periphery of the can end to fit around the member 12 and enter the channel thereof. This is a type of seam in general use.

The first step in the removal of the can end consists in pressing the seam outwardly, which is accomplished by having a supporting and gripping ring comprising sections 36 to engage the seam at the upper, outer corner thereof, as shown at A in Fig. 11. This ring causes a rotative movement to be imparted to the can. A straightening roller 15, with a thin beveled flange 16 of sharp inclination, engages beneath the seam, as shown at B in said figure, and when moved upwardly against the rotating can tends to force the seam outwardly from the can body. A second roller 17, having a beveled flange 18 of less inclination next engages the partially straightened seam and moves it further outwardly toward a right angular position relative to the axis of the can body, as shown at C in Fig. 11. Thereafter a straight-faced roller 19 engages the outstanding seam and completes the straightening thereof, as shown at D in Fig. 11. The end of the member 13 on the can end in this position has a channel-shaped rim 20 hooked over the edge of the flange formed by the member 12 on the can body, a shoulder 21 being formed where the supporting ring sections 36 grip the seam.

The next step is shown at E and consists in shredding the free end of the channel 20 on the member 13 by means of knife blades 22 arranged on the roller 19, or, if desired, on a separate roller. By cutting the end of

this channel into small strips the removal of the can end is facilitated.

The final step is shown at F and consists in severing the channel 20 by means of a cutting roller 23, on a line with the edge of the outstanding member 12, leaving the parts as shown at G where the can end is free to be removed. The U-shaped member 12 will then be in the form of a shouldered, outstanding flange, as shown at H, which is such that a new can end may be easily applied and joined to the can body as before with a lock seam, the shoulder portion 21 being of advantage in applying the new top.

With this understanding of the various steps to be performed, a mechanism for carrying them out will now be described. As here shown, the machine comprises a frame 24 carrying a pedestal 25, upon which the can is placed, said pedestal being mounted for rotation upon a spindle 26, the latter slidable in a bearing 27 on the frame and raised and lowered by means of a foot pedal 28. Above the pedestal, in spaced alinement therewith, is a chuck 29, as best shown in Fig. 12. This chuck is secured to an arbor 30 and the latter is driven by suitable mechanism 31. The head of the chuck is cylindrical in form and carries a sleeve 32 slidable thereon and provided at its bottom with a downwardly projecting flange 33 to fit within the circular ridge formed by the seam on the can end, when the can is raised into engagement therewith by means of the foot pedal.

Carried upon the sliding sleeve 32, by means of levers 34 pivoted on brackets 35, are arcuate ring sections 36, spaced radially from the sleeve. The upper ends of the levers 34 are provided with set-screws 37 working against inclined faces 38 formed on the chuck. As the sleeve 32 is raised upwardly by the can, the set screws 37, riding against the inclined faces 38, cause the ring sections 36 to be moved inwardly into engagement with the upper, outer corners of the seam and in this manner the can is securely gripped and held in place and rotated by means of the chuck.

Fixed to the frame of the machine, adjacent to the chuck and in a position surrounding the can, is an arcute holder 39 carrying retractile blocks 40, upon each of which is journaled, at the upper inner end, one of the rollers 15, 17, 19 and 23. An arcuate cam 41, movable in the holder by means of a hand lever mechanism 42, has a plurality of projecting faces arranged to engage rollers 43 journaled in recesses on the intermediate portions of the blocks 40, whereby to raise said blocks successively to present the straightening or cutting roller thereon in position to operate upon the seam in proper order.

The arrangement of the projectable blocks and cam mechanism therefor is shown in diagram in Fig. 14, where it will be seen that the cam is moved in the direction of the arrow to raise the blocks and that the first projection thereof is relatively close to the roller 43 on the block carrying the initial straightening roller; the second projection being spaced somewhat farther from the block carrying the intermediate straightening roller and the third projection being spaced still farther from the block carrying the straightening and shredding roller 19, etc., in order that said blocks will be projected in successive order, as indicated in Fig. 11. While it is immaterial whether or not the blocks remain in raised position, after they have once performed their functions, neverthless the shape of each cam projection is such as to allow the block to recede after the work of the roller thereon has been accomplished. The operating lever for the cam has a limited movement on account of the provision of stops 44 and a spring 45 is provided to return the lever and cam to normal position.

In the operation of the device the can to be opened is placed in upright position on the pedestal and the foot pedal depressed to raise the can into engagement with the chuck, whereupon the chuck acts to automatically grip the rim of the can in the manner shown in Fig. 12. With the can gripped between the ring sections 36 and the sleeve 32 it will be rotated by the chuck to permit the straightening and cutting rollers to perform their operations upon the seam thereof. The operating mechanism 42 is then moved to actuate the cam 41, causing the initial straightening roller 15 to be raised into position to engage the underside of the seam, the ring sections 36 acting as an anvil to support the upper side of the seam. The rotation of the can is quite rapid and after a few revolutions of the same the seam will be partially pressed out. Further movement of the can will cause the intermediate straightening roller to be projected into engagement with the partially straightened seam and move it farther outwardly.

Next, the roller 19 will be brought into operative position by the cam, completing the straightening of the seam and by means of the knife blades 22 shredding the free end of the channel-shaped periphery of the can top. Thereafter the roller 23 is brought into position to sever the base of the channel 20 on a line with the edge of the outstanding flange of the can body, the gripping ring 14 coöperating with said cutting roller to permit the complete severing of the channeled portion of the can end. The shredded and severed portion of the channeled rim 20 will readily fall away, leaving the can end

free to be removed from the can body. The operation is rapid and easy of control and the seam is straightened out and severed without in any way injuring the can body or spilling the contents thereof.

Various changes in the construction and arrangement of the several parts herein shown and described may be employed without departing from the spirit of my invention as disclosed in the appended claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. In a machine for removing lock seam ends from locked position on the can body, means to grip the seam so as to leave a part thereof exposed, and means operable upon said exposed portion of the seam to release same from its said locked position.

2. In a machine for removing lock seam ends from locked position along the side of the can bodies, means to receive and retain the can and rotate the same, means to engage the rotating can to press the seam upwardly and outwardly at right angles to the axis of the can body from its said position along the side of the can body, and means to effect release of the seam so as to allow the can end to be removed.

3. In a machine for removing lock seams from locked position on the can body, means to grip both the inner and outer sides of the seam and to leave the bottom portion thereof exposed, and means for operation upon said exposed portion of the seam to effect release of the seam.

4. In a machine for removing lock seam ends from locked position along the side of the can bodies, means to receive and retain the can, a plurality of beveled rollers of varying degrees of inclination to successively engage beneath the seam and force the same upwardly and outwardly from its said position along the side of the can body upon relative movement between the can and rollers, means to effect relative rotation of the cam and rollers, and means to effect release of the seam so as to allow the cam end to be removed.

5. In a machine for removing lock seam ends from can bodies, means to receive and retain the can, an initial straightening roller having a beveled flange of sharp inclination, an intermediate straightening roller having a beveled flange of less inclination, means to effect relative rotation of the can and rollers and a straight-faced roller arranged to successively engage the underside of the seam and press the same upwardly and outwardly at right angles to the axis of the can body upon relative rotation between the can and rollers.

6. In a machine for removing lock seam ends from can bodies, means to receive and retain the can, a plurality of beveled rollers of varying degrees of inclination arranged adjacent to the can and normally retracted, and means for projecting each of the said rollers to cause them to successively engage the seam on the can according to the angle of inclination, said rollers being formed so that upon projection same will press the seam upwardly and outwardly upon relative rotation between the parts, and means to effect release of the seam so as to allow the can end to be removed.

7. In a machine for removing lock seam ends from can bodies, means to receive and retain a can, an arcuate holder carrying a plurality of bevel rollers, each of a different inclination and normally retracted, means to effect relative rotation of the can and rollers, and a movable cam to coöperate with the rollers to cause them to be projected successively according to their angle of inclination, whereby the rollers are made to engage beneath the seam of the cam and force the seam upwardly and outwardly upon relative rotation between the parts.

8. In a machine for removing completed lock seam ends from can bodies, means to grip the seam on the can at the upper edge and rotate the same, a plurality of rollers engaging the underside of the seam for forcing the seam outwardly from the can body, and means to cut the seam thereby to allow removal of the end.

9. In a machine for removing lock seam ends from can bodies, means to receive a can, straightening and cutting devices and a ring fitting around the end of the can to grip the seam at its upper outer corner and form a support for the seam against the upward action of said straightening and cutting devices.

10. In a machine for removing lock seam ends from can bodies, means to receive a can, straightening and cutting devices and a contractile ring surrounding the end of the can and adapted to grip the seam at its upper outer corner to form a support therefor against the upward pressure of said straightening and cutting devices.

11. In a machine for removing lock seam ends from can bodies, means to receive a can, straightening and cutting devices, a contractile ring surrounding the end of the can and adapted to grip the seam at its upper outer corner to form a support therefor against the upward pressure of said straightening and cutting devices, and means for rotating the ring to impart rotatable movement to the can.

12. In a machine for removing lock seam ends from can bodies, means to receive a can, a contractile ring surrounding the end of the can and adapted to grip the seam at its upper outer corner to form a support therefor against the pressure of straightening and cutting devices, means for rotating

the ring to impart rotatable movement to the can, and straightening and cutting devices carried on stationary supports and projectable from below into engagement with the under portion of the seam.

13. In a machine for removing lock seam ends from can bodies, means to receive and grip the can, means for forcing the seam away from the can body leaving a flange on the body and a channel rim on the can end encompassing the flange, and means for severing the channel portion of the can end along the edge of the flange to release it therefrom.

14. In a machine for removing lock seam ends from can bodies, rotatable means to receive and grip the can, means for pressing the seam outwardly from the can body leaving a flange on the body and a channel rim on the can end encompassing the flange, and cutting means carried on a strationary support to engage the outstanding seam and sever the channel portion on a line with the edge of the flange.

15. In a machine for removing lock seam ends from can bodies, rotatable means to receive and grip the can, means for pressing the seam outwardly from the can body leaving a flange on the body and a channel rim on the can end encompassing the flange, and a cutting roller projectable into engagement with the under portion of the outstanding seam to sever the channel rim on a line with the edge of the flange.

16. In a machine for removing lock seam ends from can bodies, rotatable means to receive and grip the can, means for pressing the seam outwardly from the cam body leaving a flange on the body and a channel rim on the cam end encompassing the flange, a cutting roller projectable into engagement with the under portion of the outstanding seam to sever the channel rim on a line with the edge of the flange, and a support engaging the upper side of the outstanding seam against which the cutting roller works.

17. In a machine for removing lock seam ends from can bodies, means to receive and retain a can, means to press the seam outwardly from the can body leaving a right angular flange on the body and a channel rim on the can end encompassing said flange, and means to shred the free end of the channel portion of the can end to facilitate removal.

18. In a machine for removing lock seam ends from can bodies, means to receive and rotate a can, means engageable with the underside of the seam to press the same outwardly leaving a right angular flange on the body and a channel rim on the can end encompassing said flange, and means carried on a stationary support and engageable with the free end of said channel portion to shred the same when the can is rotated.

19. In a machine for removing lock seam ends from can bodies, means to receive and retain a can, means to press the seam outwardly leaving a right angular flange on the can body and a channel rim portion on the can end encompassing said flange, the free end of the channel portion lying below the flange, and a roller carrying a plurality of cutting knives movable into engagement with the underlying portion of the channel to shred the same upon relative rotation between the parts.

20. In a machine for removing lock seam ends from can bodies, means to receive and retain a can, means to press the seam outwardly leaving a right angular flange on the can body and a channel rim portion on the can end encompassing said flange, the free end of the channel portion lying below the flange, a roller carrying a plurality of cutting knives movable into engagement with the underlying portion of the channel to shred the same upon relative rotation between the parts, and means resting against the upper surface of the outstanding seam to support the same against the action of the shredding roller.

21. In a machine for removing lock seam ends from can bodies, means to grip the seam so as to hold the upper part thereof against upward pressure and to leave the lower part thereof exposed, and means operable upon said exposed portion of the seam to release same from its said locked position.

22. In a machine for removing lock seam ends from can bodies, vertically movable means upon which a can is placed, a chuck above said means having a sliding sleeve to fit within the rim of the can end, and a contractile gripping ring surrounding the can end and operable by the sleeve when the can is raised to grip the seam tightly at its outer upper corner and to leave the seam edge exposed at the bottom thereof.

23. In a machine for removing lock seam ends from can bodies, vertically movable means upon which a can is placed, a chuck above said means having a sliding sleeve to fit within the rim of the can end, a contractile gripping ring surrounding the can end and operable by the sleeve when the can is raised to grip the seam tightly at its outer upper corner, and means for imparting rotatable movement to the can through the agency of said sleeve and gripping ring.

24. In a machine for removing lock seam ends from can bodies, vertically movable means upon which a can is placed, a chuck above said means having a sliding sleeve to fit within the rim of the can end, a contractile gripping ring surrounding the can end and operable by the sleeve when the can is raised to grip the seam tightly at its outer upper corner, means for imparting rotatable

movement to the can through the agency of said sleeve and gripping ring, and means movable into engagement with the underside of the seam to press the same outwardly.

25. In a machine for removing lock seam ends from can bodies, vertically movable means upon which a can is placed, a chuck above said means having a sliding sleeve to fit within the rim of the can end, a contractile gripping ring surrounding the can end and operable by the sleeve when the can is raised to grip the seam tightly at its outer upper corner, means for imparting rotatable movement to the can through the agency of said sleeve and gripping ring, means movable into engagement with the underside of the seam to press the same outwardly, and means movable into engagement with the straightened seam to sever the interlocking portion thereof.

26. In a machine for removing lock seam ends from can bodies, a pedestal to receive the can in upright position, a rotatable chuck above the pedestal, means for raising said pedestal to engage the end of the can with the chuck and a sliding sleeve on the chuck to fit within the raised rim of the can end, a contractile gripping ring surrounding the raised rim of the can, means operable by the sliding movement of the sleeve when the can is raised into engagement with the chuck to contract said ring and cause it to grip the upper outer corner of the seam, whereby rotatable movement is imparted to the can, an arcuate holder adjacent to the can body and lying below the chuck, a plurality of straightening rollers each with a bevel flange of different inclination, a shredding roller and a cutting roller all carried by projectable blocks in said arcuate holder, and a cam for raising said blocks to cause the straightening, shredding and cutting rollers to engage successively beneath the seam, whereby to press the seam outwardly, shred and sever the interlocking portions without mutilation of the portion of the seam integral with the can body.

27. In a machine for removing lock seam ends from can bodies, means to receive and retain the can, to frictionally engage and rotate the same, means to engage the rotating can to open the seam and bend the can flange upwardly and outwardly at a right angle to the axis of the can body and means to effect release of the seam so as to allow the can end to be removed.

28. In a machine for removing lock seam ends from can bodies, a series of means to progressively press the seam outwardly, movable cutting means, and means common to all of said means to actuate same.

29. In a machine for removing lock seam ends from can bodies, rotatable means to receive and frictionally grip the can, means for pressing the seam outwardly from the can body leaving a flange on the body and a channel rim on the can end encompassing the flange, and cutting means carried on a movable support to engage the outstanding seam and sever the channel portion on a line with the edge of the flange.

30. In a machine for removing lock seam ends from can bodies, means to receive and retain a can, means to press the seam outwardly from the can body leaving a right angular flange on the body and a channel rim on the can end encompassing said flange, and means to sever the channel portion of the can end circumscribing the marginal edge of the can flange.

31. In a machine for removing lock seam ends from can bodies, means to receive and rotate a can, means successively engageable with the underside of the seam to progressively press the same outwardly and open leaving a right angular flange on the body and a channel rim on the can end encompassing said flange, and means operating in sequence thereto to sever said channel portion as the can is rotated.

32. In a machine for removing lock seam ends from can bodies, a series of means for progressively pressing the seams outwardly, a movable cutting means, and a cam common to all of said means to actuate same.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ROBERT M. HUDDLESTON.

Witnesses:

JOHN H. HERRING,

W. W. HEALEY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."