J. A. GRAY.

AUTOMATIC CAN END FEED MECHANISM.

APPLICATION FILED APR. 16, 1914.

1,162,156. Patented Nov. 30, 1915.

2 SHEETS—SHEET 1.

Fig. 1.

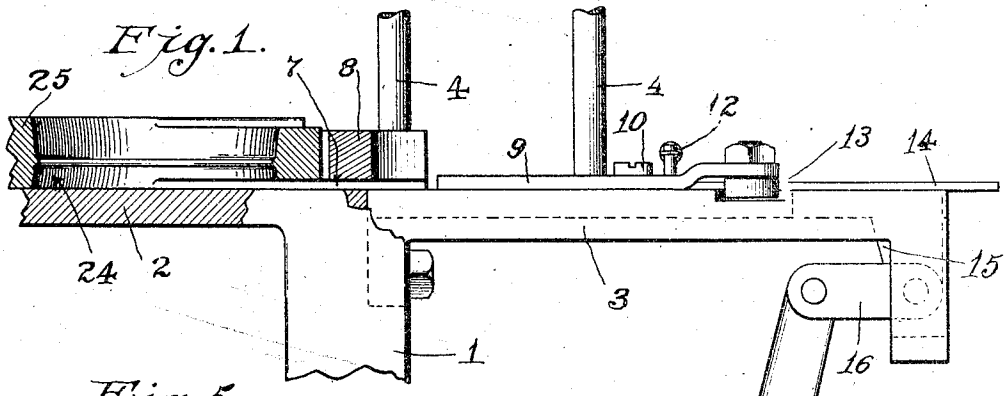
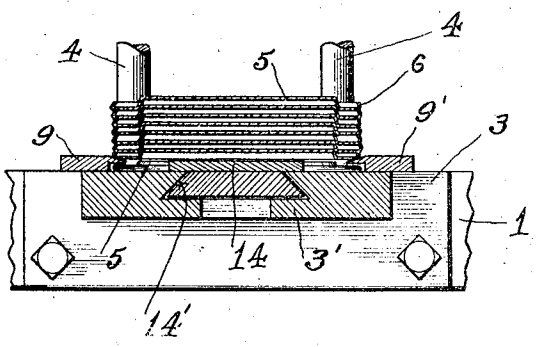
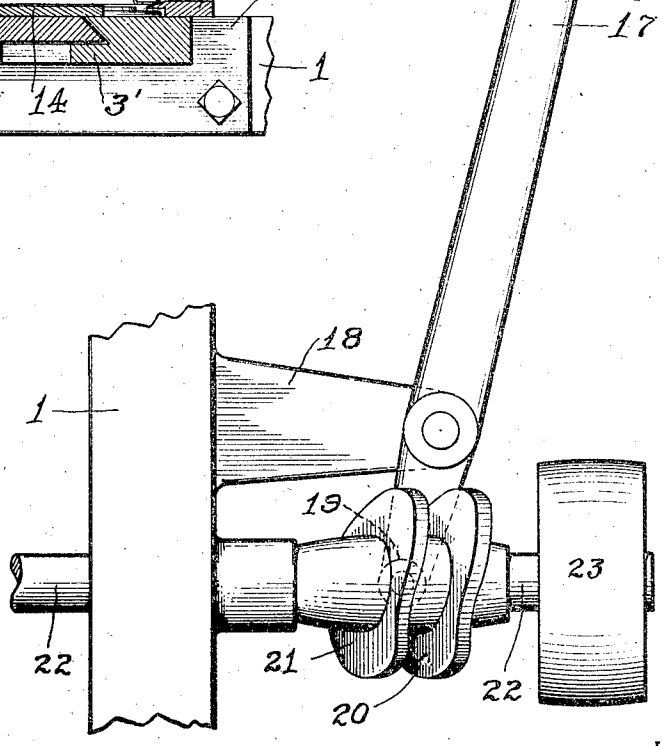


Fig. 5.





WITNESSES:

J. D. Thornburgh.

S. Constine.

INVENTOR.

James A. Gray

BY

his ATTORNEY

J. A. GRAY.

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2 SHEETS—SHEET 2.

Fig. 2.

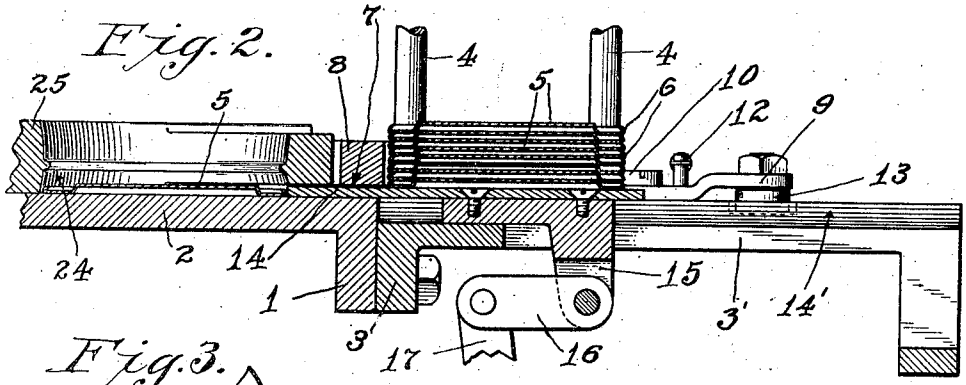


Fig. 3.

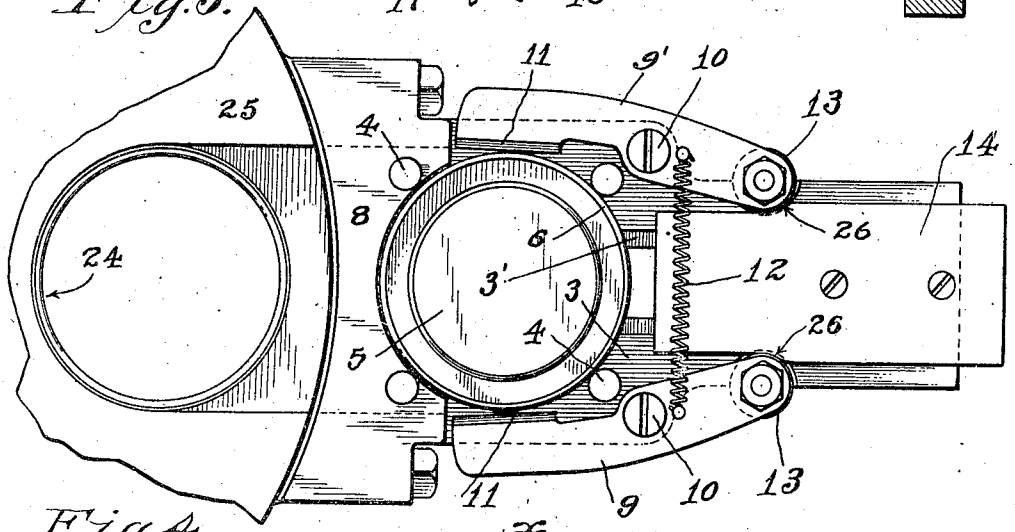
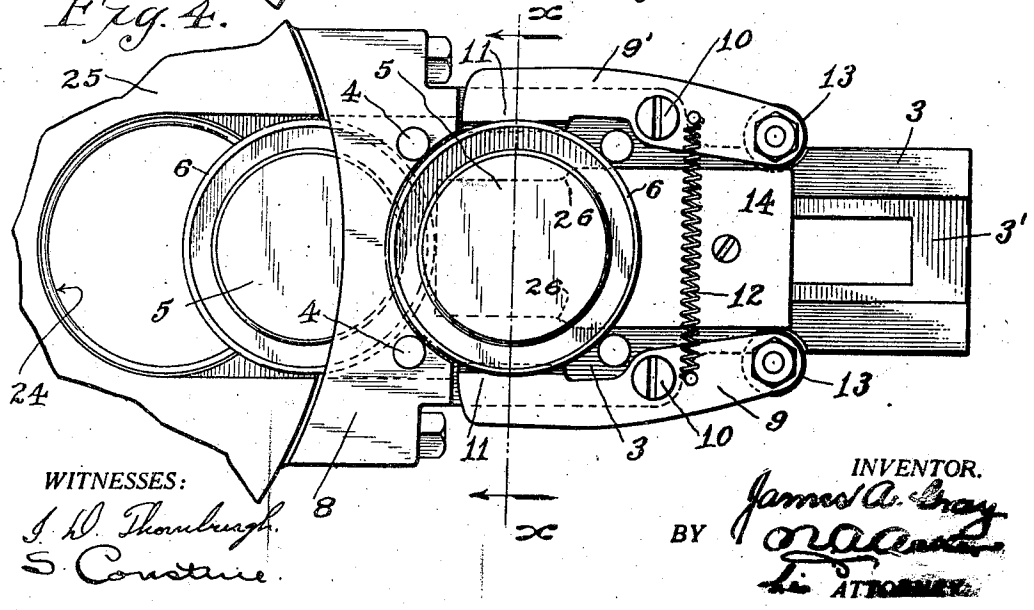


Fig. 4.



WITNESSES:

J. W. Thornburgh.

S. Constine.

INVENTOR.

James A. Gray

BY

Munn & Co.

ATTORNEYS.

UNITED STATES PATENT OFFICE.

JAMES A. GRAY, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO AMERICAN CAN COMPANY, OF SAN FRANCISCO, CALIFORNIA, A CORPORATION OF NEW JERSEY.

AUTOMATIC CAN-END-FEED MECHANISM.

1,162,156. Specification of Letters Patent. Patented Nov. 30, 1915.

Application filed April 16, 1914. Serial No. 832,263.

To all whom it may concern:

Be it known that I, JAMES A. GRAY, a citizen of the United States, residing in the city and county of San Francisco and State of California, have invented certain new and useful Improvements in Automatic Can-End-Feed Mechanism, of which the following is a specification.

The hereinafter described invention relates to an improved feed mechanism for automatically extracting a can end or head from a stack of such ends or heads and delivering the same to any suitable structure or associated instrumentality designed to receive the same, the said feed mechanism being more especially utilized for the feeding of what is known as curled flanged can ends or heads, although its use is not restricted to such type of heads; the object of the invention being to provide a simple, inexpensive, durable and efficient structural apparatus for expeditiously and accurately removing the lowermost end or head from a stack of such ends or heads, and one wherein the construction and interworking of the associated parts is such that the entire stack of the ends or heads, with the exception of the lowermost one of the said stack, is first bodily lifted or raised a given distance to clear the lowermost end or head of the stack, which released end or head is then removed from the holder for the stack of ends or heads and delivered to a suitable place of deposit, after which the entire stack of the raised ends or heads is gradually lowered or restored to position within the holder.

To comprehend the invention, reference should be had to the accompanying sheets of drawings, wherein:—

Figure 1 is a view in side elevation, partly broken away, illustrating the can end or head holder, the reciprocating feed slide, the means for operating the same, the position of one of the cut out blades actuated by the movements of the feed slide, and the means for receiving the end or head removed from the stack within the holder therefor. Fig. 2 is a longitudinal sectional view of the parts set forth in Fig. 1 of the drawings, with the feed slide in its advanced position and the actuating mechanism for the said slide broken away. Fig. 3 is a plan view disclosing the improved can end or head feed mechanism of Fig. 2 of the drawings, illustrating the cut out blades in open position and the feed slide drawn outwardly its full distance. Fig. 4 is a similar view with the cut out blades in closed position and the feed slide illustrated as removing from the holder and delivering to its associated instrumentality the lowermost end or head of the stack of can ends or heads. Fig. 5 is a cross sectional view taken on line *x*—*x* Fig. 4 of the drawings and viewed in the direction of the arrows.

In the drawings, the numeral 1 is used to designate any suitable form of a supporting structure for sustaining the working parts of the apparatus, carrying, in the present case, at its upper end portion, a table section 2 and an outwardly projected supporting bracket 3. The bracket 3 supports the can end holder 4, in which is held a stack of horizontally disposed can ends or heads 5, each of which in the present case is formed with an incurled edge flanged portion 6. The lowermost end or head of the stack within the holder 4 rests on and is supported by the bracket 3 in horizontal alinement with a transverse can end or head opening 7 formed by the plate 8 attached to the frame 1 so as to lie a slight distance above the horizontal plane of the table 2.

To the upper face of the bracket 3 the spaced arms 9 and 9′ are fulcrumed by the pins 10 to swing horizontally (Figs. 2, 3 and 4 of the drawings) and the inner end of each arm terminating in a beveled blade section 11 and said arms are connected at their outer end portion by the spring 12, in order that the blade section of the arms will be held normally separated their full distance. To the outer end of each swinging arm is secured a depending roll 13, which rolls are held in contact by the pressure of the spring 12 with the edge surface of a horizontally reciprocating slide plate 14, which slide plate works within a guide-way 14′ formed in face 3′ of the supporting bracket 3, Fig. 5 of the drawings, and the position of the said slide plate 14 is such that its inner edge is in line with the curled edge of the can end or head 5 resting on the surface of the said supporting bracket 3.

To a short stud 15 depending from the outer end of the slide 14 is connected by a link 16, the upper end of a lever 17, which lever is fulcrumed to a bracket 18 projecting from the bottom portion of the frame 1,—Fig. 1 of the drawings, and at its lower

end the said lever 17 carries a projecting roll 19, which roll works within an irregular shaped guide groove 20 formed in the cam 21 secured to the drive shaft 22 working in suitable bearings and driven by any suitable means, as, for instance, by a power belt working over a belt pulley 23 secured on the shaft 22.

The can ends or heads 5 as removed successively from the stack or ends or heads contained within the holder 4, are delivered through the passage-way 7 onto the table 2, and into one of a series of semi-circular seats 24 cut in the periphery of a horizontally rotatable turret 25 working over the table 2 and designed to receive the can ends or heads and remove the same to a suitable place of deposit. The construction and working of this turret forms no portion of the present invention, and therefore calls for no specific description herein, the same merely serving to illustrate a convenient form of an associated instrumentality for receiving the can ends or heads delivered thereto by the feed mechanism and removing the same either to be acted on by other can machinery or to a suitable place of deposit.

In the operation of the described can end or head feed mechanism, assuming the holder 4 to be filled with a stack of ends or heads 5, as the slide 14 is thrown forward or inwardly by the action of the fulcrumed lever 17 toward the can end or head holder 4, the outwardly inclined surfaces 26 thereof engage with the rolls 13 of the horizontally swinging arms 9 and 9′ and forces or spreads apart the said arms at their outer end portions, bringing together the inner end portions thereof and forcing the blade sections 11 of said arms beneath the stack of ends or heads 5 immediately above the lowermost one of the stack and by the continued inward movement thereof gradually raising the entire stack a slight distance, leaving the lowermost one of the stack of heads free. As the slide 14 continues its inward stroke or movement, the inner edge thereof engages with the flange of the released can end or head and forces the same from off its seat and through the passage-way or opening 7 into one of the semi-circular seats 24 of the horizontally rotatable turret 25 in registry with the passage-way or opening 7 to receive the same, the said cut-out end or head being removed by said associated instrumentality to any suitable place of deposit. On the return or outward stroke of the slide 14, the inclined surfaces 26 gradually move out of contact with the rolls 13 and the action of the spring 12 draws together the outer portion of the swinging arms 9 and 9′, gradually opening or spreading apart the inner end portions thereof and removing the blade sections 11 from beneath the stack of can ends or heads, thus allowing the entire stack to lower to place the lowermost end or head thereof in the position formerly occupied by the displaced end or head. The ends or heads are thus successively removed from within the holder therefor, and the stack of heads within the holder, with the exception of the lowermost one, gradually raised during the instroke of the reciprocating slide 14, while the said stack is lowered on the outward or return stroke of the said slide.

For convenience, the fulcrumed arms 9 and 9′ shall hereafter be termed cut-out blades or devices, inasmuch as the function thereof is to raise the confined stack of heads to cut out the lowermost one, while the slide 14 shall be termed a feed slide, due to the fact that its function is to remove the cut out end or head from within the sphere of the holder for the stack to feed the same to the associated instrumentality for receiving the same for removal to a suitable place of deposit.

The cut out blades are actuated to raise the desired ends or heads of the stack within the holder during the inward or forward stroke of the reciprocating feed slide, and to open for gradually lowering the stack of ends or heads during the outward or return stroke of the said feed slide, it being understood that owing to the shape of the portions 11 of the cut out blades, the raising and lowering of the stack of heads within the holder 4 is a gradual one, so that the lowermost end or head of the stack of heads is gently deposited onto the supporting bracket 3.

The movement of the actuating mechanism for the feed slide is so timed with respect to the movement of the associated instrumentality 25, that a can end or head is delivered thereto only at such times as there is positioned in alinement with the passage-way 7 a semi-circular seat 24 to receive the cut out end or head.

While the member 25 has been referred to as a means for receiving the cut out end or head and delivering the same to a suitable place of deposit, it is obvious that the same may be dispensed with and any suitably constructed device substituted therefor to receive the cut out end or head discharged by the feed slide from within the sphere of the holder for the stack of ends or heads, which means, if so desired, may partake of the form of an ordinary runway or a belt carrier for delivering the end or head discharged by the feed slide to a suitable place of deposit.

In the present case, the can ends or heads are represented as being non-lined, *i. e.* not provided with a seal liner ring for the flange thereof, and the feed mechanism as employed for delivering the ends or heads successively to means for conveying the same to an apparatus for applying a ring liner to the

curled flange of the said ends or heads, but obviously this is only one use to which the improved feed mechanism may be applied, inasmuch as it is applicable for the feeding of can ends of any type to machinery generally in connection with either the can making machinery or the canning art.

While I have described the preferred embodiment of the improved can end or head feed mechanism as embraced within a practical and operative apparatus for delivering can ends or heads to associated instrumentalities in the can making art, still, I do not wish to be understood as restricting or confining the invention to the details of construction of the working parts as herein illustrated and described, being well aware that various changes may be made in the operation and construction of the working parts without creating a departure from the nature and scope of the invention, which resides essentially in automatically operated means for raising and maintaining in a raised position a stack of assembled can ends or heads, with the exception of the one to be cut out, removing said released end or head from within the sphere of the holder for the stack thereof while held in its raised position, and then lowering the said stack to position the lowermost one thereof to be cut out.

Having thus described the invention what is claimed as new and desired to be protected by Letters Patent is:—

1. In a can end feed mechanism, the combination with a holder for a stack of horizontally disposed can ends, of a supporting frame therefor, of horizontally reciprocating swinging devices fulcrumed to the supporting frame for cutting out the lowermost end of the stack by raising the remainder of said stack within the holder, and sliding means co-acting with said devices for throwing the same into action and for removing the cut-out end from within the sphere of the holder.

2. In a can end feed mechanism, the combination with a holder for a stack of can ends, of a supporting frame therefor, of swinging devices fulcrumed upon said frame for raising the stack of ends within the holder with the exception of the lowermost one of the stack, and sliding means for removing the freed lowermost end of the stack from within the sphere of the holder and for actuating the swinging devices for raising the stack of can ends with the exception of the lowermost end thereof.

3. A can end feed mechanism, the same comprising a holder for a stack of can ends, a supporting frame therefor, swinging means fulcrumed upon said frame, movable into and out of the sphere of said holder adjacent the bottom thereof for raising the stack of ends to cut out the lowermost one thereof and lowering the stack after the removal of said end, a reciprocating slide for actuating said means and removing from within the sphere of the holder the cut out end of the stack of ends.

4. A can end feed mechanism, the same comprising a holder for a stack of can ends, a supporting frame therefor, primary swinging means fulcrumed upon said holder for raising the stack of ends with the exception of the lowermost one of the stack and lowering the said stack on the removal of the cut out end, secondary sliding means for actuating said primary swinging means and removing from within the sphere of the holder the cut out end, mechanism for imparting motion to the secondary sliding means, and means for receiving the removed end and conveying the same to a suitable place of deposit.

5. In a can end feed mechanism for the described purpose, the combination with a supporting frame, of an open holder secured thereto adapted to contain a stack of horizontally disposed can ends, a pair of swinging cut out blades pivoted to the supporting frame for engaging the stack of can ends to raise the same for cutting out the lowermost end of the stack and lowering the said stack on the removal of the cut out end, a horizontally reciprocating slide for removing the cut out end, said slide actuating the cut out blades for engaging and raising the stack of ends with the exception of the lowermost end of the stack, and means for restoring the cut out blades to normal position on the return movement of the said slide.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES A. GRAY.

Witnesses:
I. D. THORNBURGH.
D. B. RICHARDS.