G. W. BLANKENHORN & T. CASTBERG.

CAN END SEPARATOR AND FEEDER.

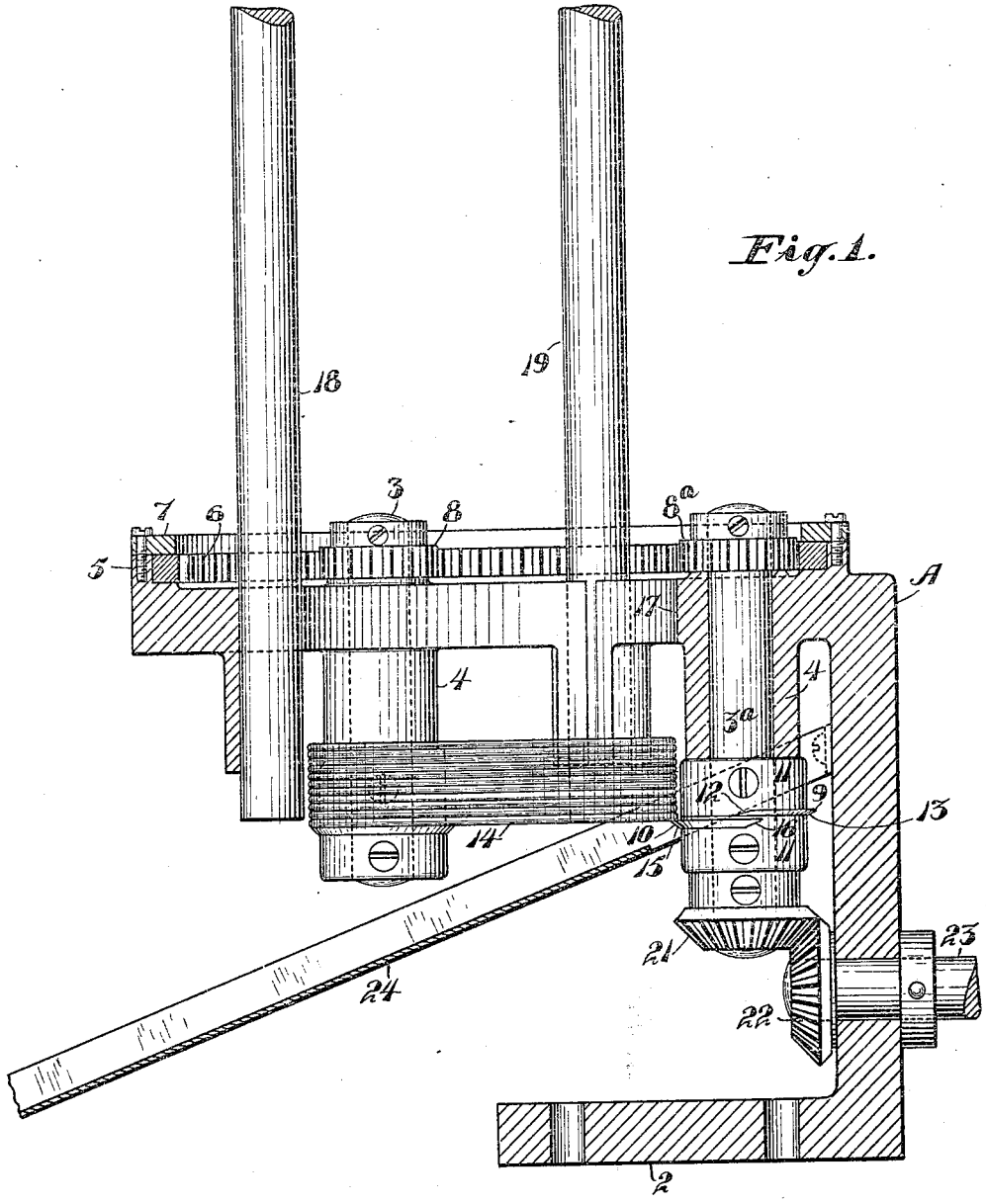
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1,272,764.

Patented July 16, 1918.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

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2 SHEETS—SHEET 2.

Fig. 2.

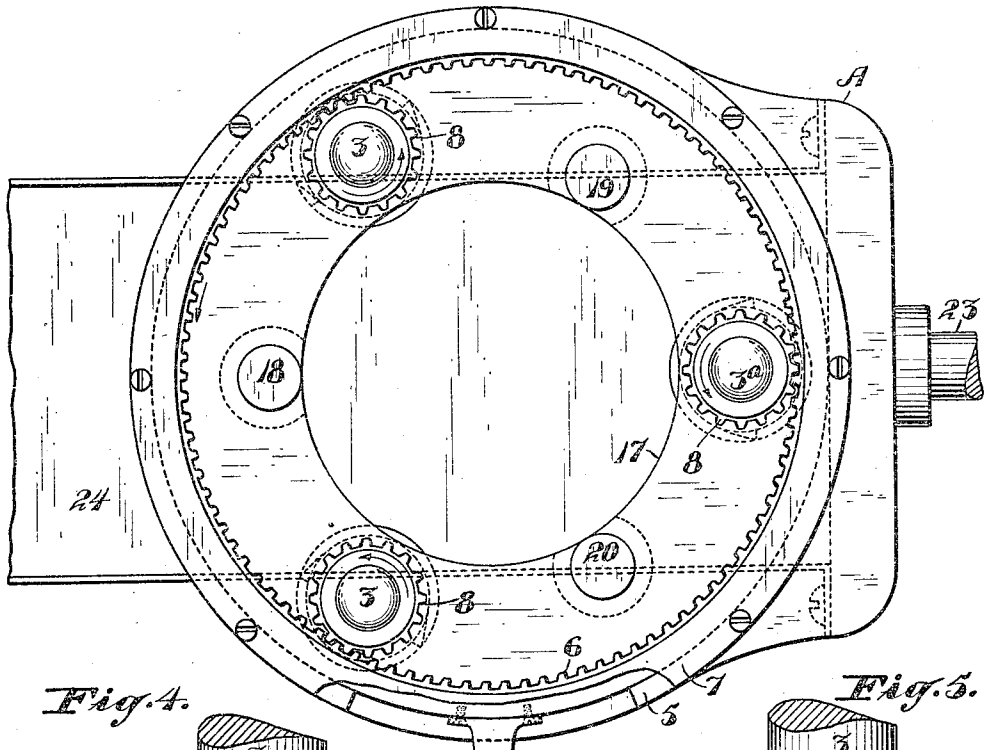


Fig. 4.

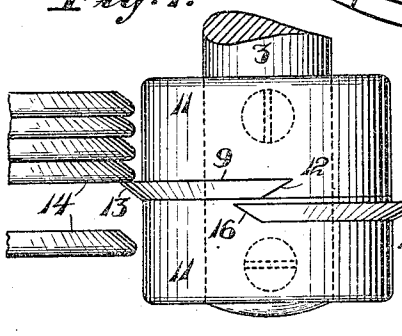
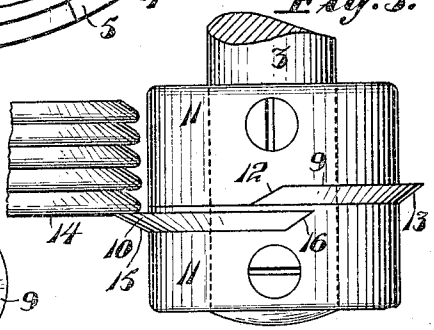


Fig. 5.



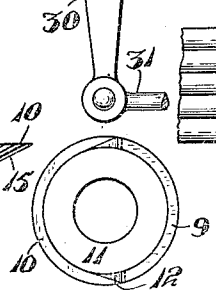


Fig. 3.

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UNITED STATES PATENT OFFICE.

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CAN-END SEPARATOR AND FEEDER.

1,272,764. Specification of Letters Patent. Patented July 16, 1918.

Application filed May 16, 1917. Serial No. 168,977.

To all whom it may concern:

Be it known that we, GEORGE W. BLANKENHORN and THOMAS CASTBERG, citizens of the United States, residing at the city and county of San Francisco and State of California, have invented new and useful Improvements in Can-End Separators and Feeders, of which the following is a specification.

This invention relates to a can end separator and feeder.

One of the objects of the present invention is to provide a simple, compact, cheaply manufactured machine provided with means for receiving and guiding a stack of can ends, and in conjunction therewith to provide a plurality of movable members which support, separate and release the ends one by one from the bottom of the stack. Another object of the invention is to provide a plurality of movable members which may be either oscillated or continuously rotated while they are supporting, separating and releasing the can ends one by one. Another object of the invention is to provide positive means for oscillating or rotating the said members in unison. Further objects will hereinafter appear.

The invention also consists of the parts and the construction and combination of parts hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is a central, vertical section of the can end separator and feeder.

Fig. 2 is a plan view of the same.

Fig. 3 is a detail plan view of the can end supporting, separating and releasing members.

Fig. 4 is an enlarged detail view showing the can end stack supported by the upper ledge and the lowermost can end in released position.

Fig. 5 is a view similar to Fig. 4 showing the can end stacks supported by the lower ledge.

Referring to the drawings in detail, A indicates a frame of suitable size and shape which may be supported by a bracket extension 2. Formed in the upper portion of the frame is a plurality of bearing members 4 and extending through each bearing member and journaled therein is a shaft 3. Freely turnable in an annular circular flange 5 formed on the upper side of the frame is an internal gear 6 which is secured against upward movement or vertical displacement by a cover plate 7. Secured on the upper end of each shaft 3 is a spur gear 8 which is adapted to constantly mesh with the teeth formed on the internal gear and secured on the lower end of each shaft 3 is a pair of can end supporting, separating and releasing members. These members consist in reality of a pair of superposed shoulders or detents 9 and 10 which are adapted to alternately engage the can ends in the stack, as will hereinafter be described. The upper face of the ledge 9 is flat and forms a continuous horizontally positioned supporting shoulder extending a little more than one-half the circumference of the hub member 11 upon which it is formed, the ends being preferably beveled or tapered, as shown at 12, to permit a free engagement or release with relation to the ends in the stack.

The lower face of the ledge 9 is beveled, as at 13, and said bevel conforms with the outer edge of each can end. The spacing between the upper face of the ledge 9 and the upper face of the ledge 10 is equal to the thickness of the outer beveled can end flange 14 shown in Figs. 1, 4 and 5. The lower ledge also extends a little more than one-half the circumference of the hub member 11 and its upper surface is also continuous and horizontally positioned in parallelism with the upper face of the ledge 9, the lower face being beveled, as at 15, and the ends flared, as at 16, to permit of free release of the ends one by one as will be described.

There are three sets of superposed ledges employed in the present instance, thereby providing a three point support for the can end stack, and as two ledges are employed at each supporting point, it can readily be seen that the three upper sets of ledges and the three lower sets of ledges will alternately support the can end stack, which in this instance passes through a central opening 17 formed in the frame.

Any suitable means may be employed for the purpose of receiving and guiding the can end stack, but three rods 18, 19 and 20 evenly spaced and adjustably secured in the frame A are preferably employed. These rods may extend above the upper side of the frame any suitable distance and may therefore serve as a guide for a can end stack of any suitable height. The shaft shown at 3^a in Figs. 1 and 2 is preferably provided

with a bevel gear 21 on its lower end which remains in constant mesh with a bevel gear 22 secured upon a driving shaft 23 to which power may be transmitted in any suitable manner.

In operation with power transmitted to the shaft 23, it can readily be seen that a continuous rotary movement will be transmitted to the shaft 3^a through the bevel gears 21 and 22. This movement is in turn transmitted through the spur gear 8^a to the internal gear 6, which in turn transmits a continuous rotary movement to the spur gears 8 secured on the remaining two shafts shown at 3. This continuous rotary movement transmitted revolves the detents 9 and 10 into and out of engagement with the two lowermost ends in the stack. For instance, referring to Fig. 5, it can be seen that the lower set of ledges 10 are supporting the stack as the upper ledges are out of engagement with the same. A continuation of the rotary movement will, however, move the detents 9 into engagement with the second lowest end in the stack a moment before the lower detents move out of engagement. The overlapping of the upper and lower detents, as shown in Figs. 3, 4 and 5, permits the upper detents to engage the second lowest end in the stack before the lower detents release the lowermost end in the stack. A further rotation will, of course, turn the lower detents entirely out of engagement with the lowermost end in the stack and will, therefore, leave this suspended or free to drop away from the stack upon an inclined chute 24 or any other suitable means which will remove it from the machine. A further rotation will again bring the lower detents into alinement with the can and stack a moment before the upper detents move out of engagement and they will therefore be in position to receive the weight of the can end stack the moment it is released by the upper detents 9. The whole stack therefore drops the distance of the thickness of one can end flange when released by the upper set of detents and will therefore remain supported by the lower set of detents until the upper set of detents again engages the stack and supports the same while the lowermost end is being released by the lower set of detents.

The upper surface of the lower detents serves as a supporting shelf for the entire can end stack and the upper face of the upper detents also serves as a supporting shelf for the entire stack. The detents, however, alternately support the entire stack and it is therefore possible to release the ends one by one when a revolving movement is transmitted to the several sets of supporting, separating and releasing detents. In view of the fact that the lower face of the upper detents is inclined, as shown at 13, it can readily be seen that said detents can enter into engagement with the ends of the stack without lifting the stack as the angle presented by said face fits the angular face of the can end flanges. The stack, therefore, gradually drops from one set of detents to another while feeding and an upward movement of the stack at any time is entirely eliminated, thereby permitting greater speed and less damage to the ends as actual impact or raising movement is positively averted. The cutting away of the detents a distance equal to approximately half the circumference leaves a time period more than sufficient to permit the stack to drop from one set of detents to another, in other words, making it possible to separate and release the ends almost as fast as specific gravity will permit the ends to drop. Practically any speed may, therefore, be obtained.

While a continuous rotary movement has been described, we wish it understood that an oscillating movement may also be imparted to the detents. With this object in view a lever extension 30 has been provided and secured to the internal gear 6. This lever passes through a slot formed in the annular rim 5 and a link 31 connected to the lever and any oscillating or rotating member can, therefore, transmit an oscillating movement to the internal gear as the lever extension 30 is free to move back and forth in the slot formed in the rim. The oscillating movement imparted to the internal gear is, of course, transmitted through the gears 8 to the shafts 3 carrying the supporting, separating and releasing detents. This movement, so far as the detents are concerned, may be less than 45°, or, in other words, just sufficient to bring the upper and lower detents alternately into and out of engagement with the ends in the stack. The oscillating movement has been found advantageous when the feeder is used in connection with certain types of machines and the two methods of driving or operating the detents 9 and 10 are therefore described. The bevel gears 21 and 22 may be removed when an oscillating movement is transmitted.

It is understood that the lever 30 may be removed when continuous rotary motion is transmitted. It is also understood that a crank arm might be secured upon the shaft 23 to transmit an oscillating movement and that the materials and finish of the several parts employed may be such as the experience and judgment of the manufacturer may dictate.

The essential feature of this invention is the mechanism for supporting and releasing can ends singly from a column through the rotative movement of detent members, such as 9—10, arranged on a vertical support, the

detent members being disposed at different levels suitably spaced so that the edge of a can end of a column may drop successively from one ledge to the other and finally be discharged from the lowermost edge through the rotative movement of the support; this rotative movement being, of course, either continuous rotary or oscillatory motion.

It is manifest that various changes in the details of construction may be made in the device without departing from the spirit of the invention.

Having thus described our invention, what we claim and desire to secure by Letters Patent is:—

1. In a can end separator and feeder, a frame having a central opening formed therein, a plurality of vertically positioned rods secured adjacent said opening adapted to receive and guide a can end stack, a plurality of shafts journaled in the frame adjacent the central opening, a collar member secured on each shaft, a pair of overlapping supporting shoulders formed on each collar, said shoulders being offset with relation to each other and superposed to assume different planes, the distance between the shoulders in a vertical direction being equal to the thickness of one can end flange, and means for transmitting a movement to the shafts in unison which will bring each pair of supporting shoulders alternately into and out of engagement with the can end stack.

2. In a can end separator and feeder, a frame having a central opening formed therein, means for receiving and guiding a stack of can ends, a plurality of shafts journaled in the frame adjacent the central opening, a pair of overlapping supporting shoulder members carried by each shaft, said shoulders being offset with relation to each other and superposed to assume different planes, the distance between the shoulders in a vertical direction being equal to the thickness of one can end flange, and means for transmitting a movement to the shafts in unison which will bring each pair of supporting shoulders alternately into and out of engagement with the can end stack.

3. In a can end separator and feeder, a frame having a central opening formed therein, a plurality of vertically positioned rods secured adjacent said opening adapted to receive and guide a can end stack, a plurality of shafts journaled in the frame adjacent the central opening, a collar member secured on each shaft, a pair of overlapping supporting shoulders formed on each collar, said shoulders being offset with relation to each other and superposed to assume different planes, the distance between the shoulders in a vertical direction being equal to the thickness of one can end flange, and means for transmitting a continuous rotary movement to the shafts in unison to bring each pair of supporting shoulders alternately into and out of engagement with the can end stack.

4. In a can end separator and feeder, a frame having a central opening formed therein, a plurality of vertically positioned rods secured adjacent said opening adapted to receive and guide a can end stack, a plurality of shafts journaled in the frame adjacent the central opening, a collar member secured on each shaft, a pair of overlapping supporting shoulders formed on each collar, said shoulders being offset with relation to each other and superposed to assume different planes, the distance between the shoulders in a vertical direction being equal to the thickness of one can end flange, a gear secured on each shaft, an internal gear intermeshing with said gears, and means for transmitting a rotary movement to the internal gear to bring the supporting shoulders alternately into and out of engagement with the can end stack.

5. In a can end separator, a separating device including a rotatable support mounted on a vertical axis and carrying a pair of circumferential ledges or detents, each ledge of approximately 180° in length and arranged in different planes slightly spaced one from the other, so that the can end may drop from one ledge to the other and finally off of the lowermost edge by the rotative movement of the support.

6. In a can end separator, a separating device including a rotatable support mounted on a vertical axis and carrying a pair of circumferential ledges or detents, each ledge of approximately 180° in length and arranged in different planes slightly spaced one from the other, so that the can end may drop from one ledge to the other and finally off of the lowermost edge by the rotative movement of the support, said ledges being wedge-shaped for entry between the can ends.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

GEORGE W. BLANKENHORN,
THOMAS CASTBERG.

Witnesses:
W. W. HEALEY,
M. E. EWING.

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