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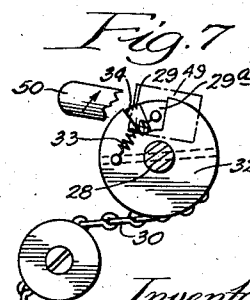
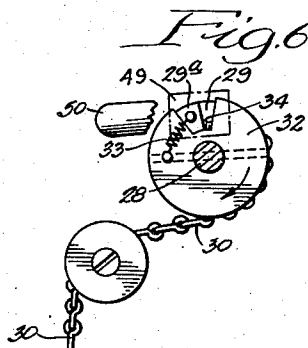
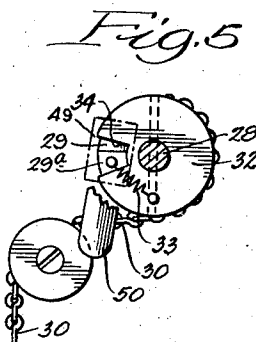
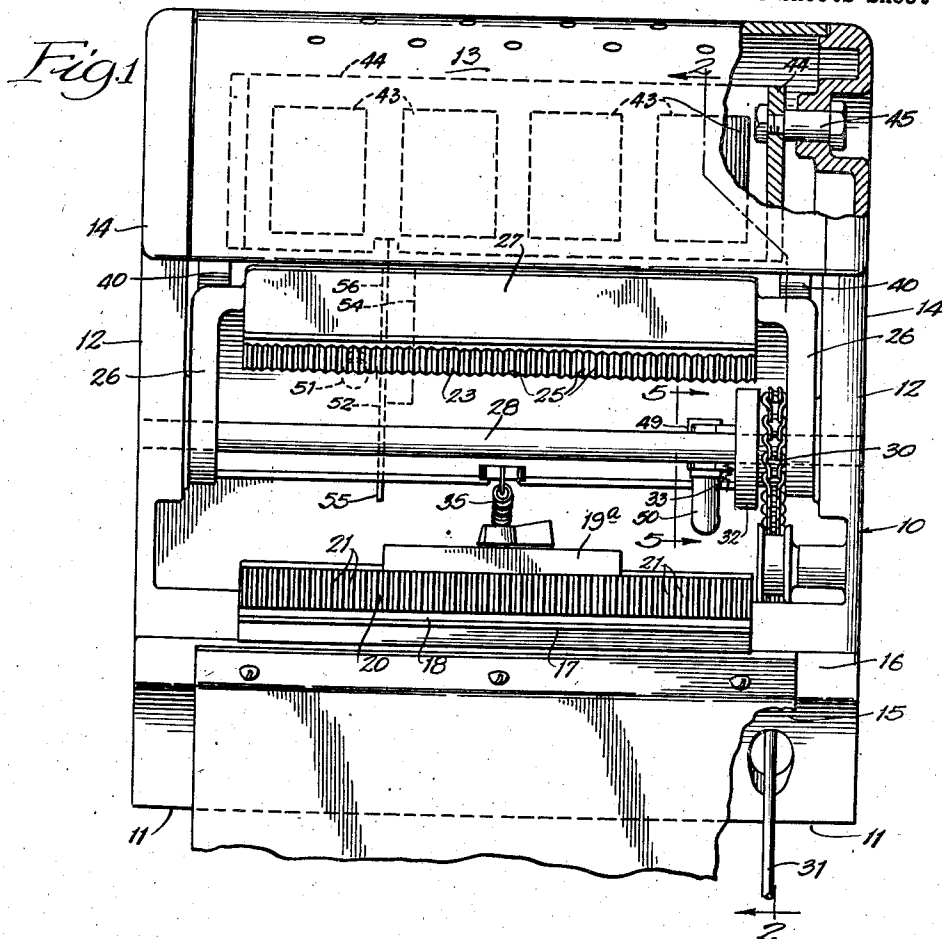
M. H. CORLEY ET AL

2,340,510

BAG SEALING MECHANISM

Filed March 6, 1941

4 Sheets-Sheet 1



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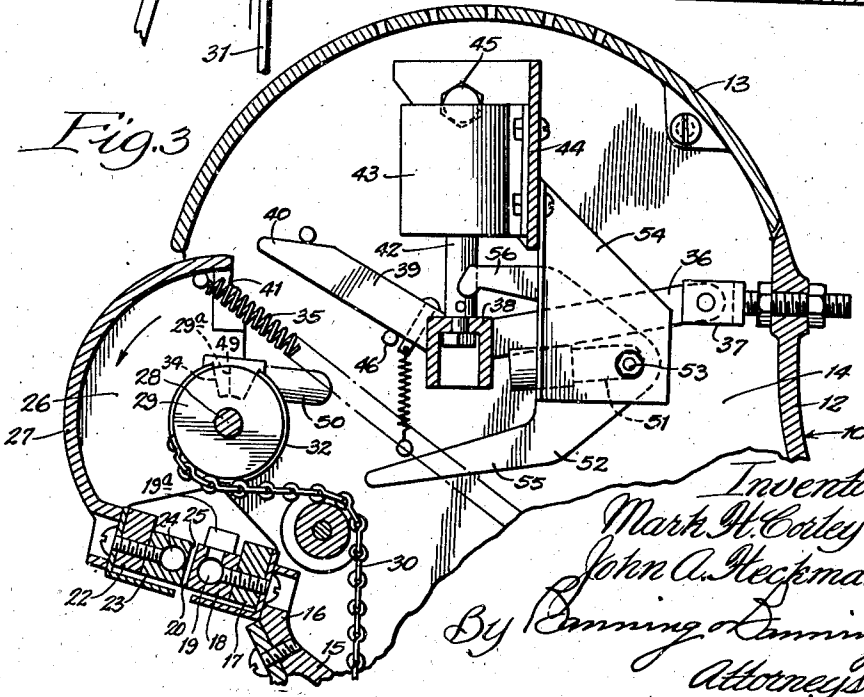
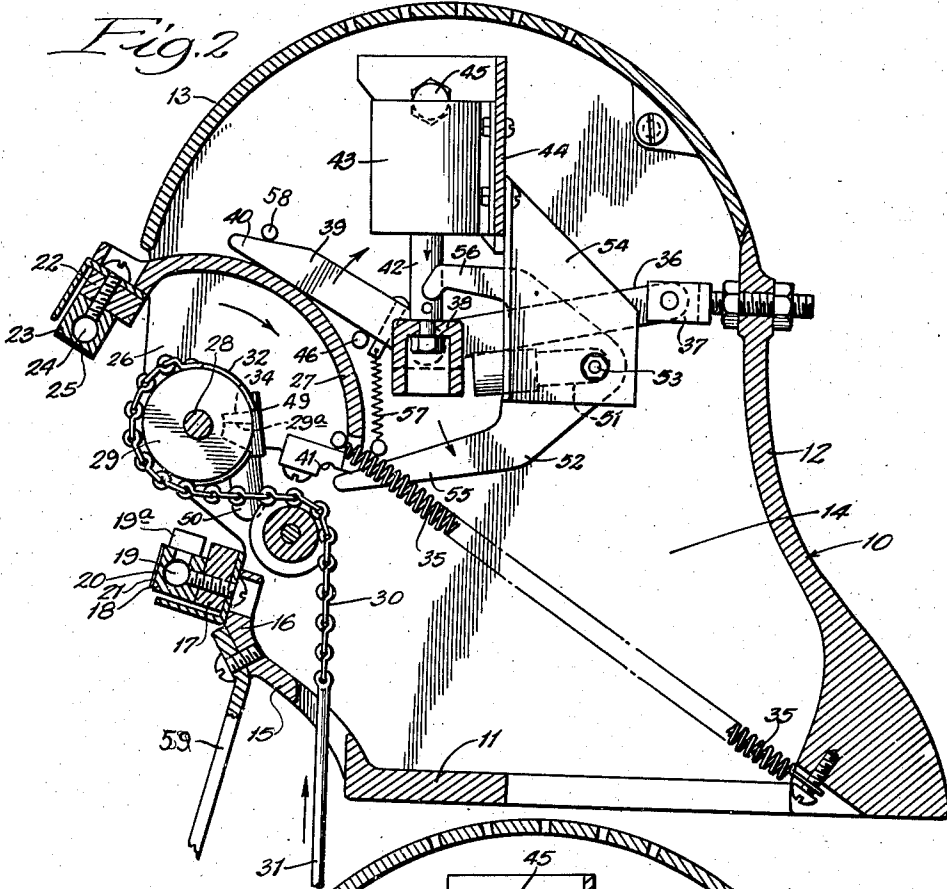
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2,340,510

BAG SEALING MECHANISM

Filed March 6, 1941

4 Sheets-Sheet 2



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Feb. 1, 1944.

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2,340,510

Filed March 6, 1941

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Fig. 4

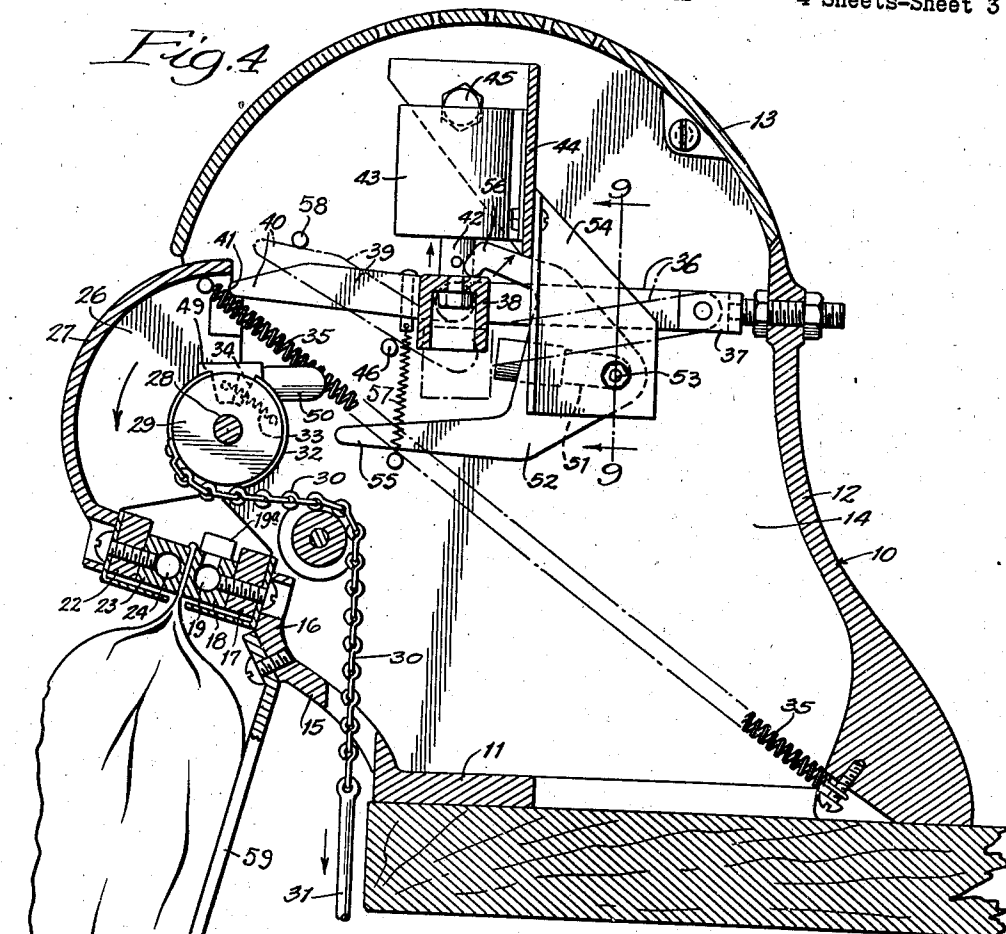
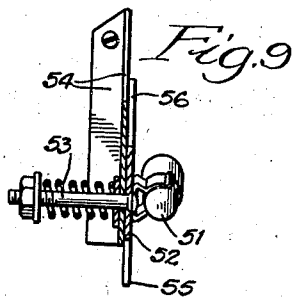
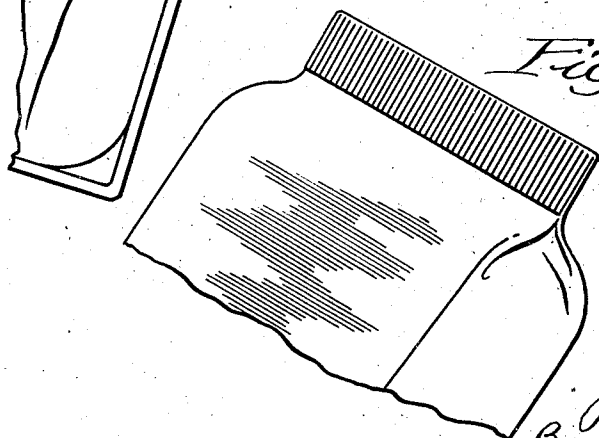


Fig. 8



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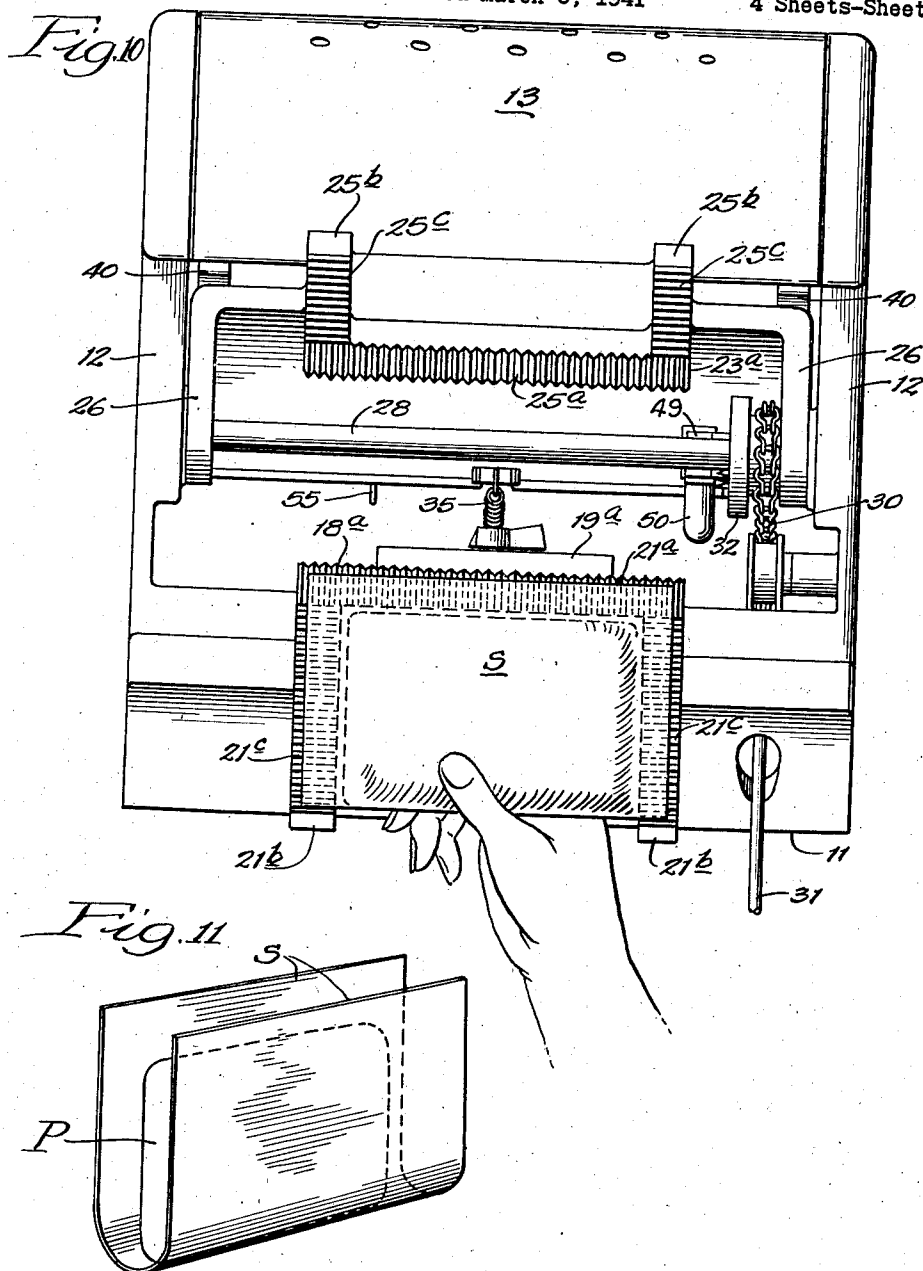
Feb. 1, 1944.

M. H. CORLEY ET AL
BAG SEALING MECHANISM

2,340,510

Filed March 6, 1941

4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

2,340,510

BAG SEALING MECHANISM

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Application March 6, 1941, Serial No. 381,974

5 Claims. (Cl. 154—42)

The present invention is directed to a foot or hand operated device, which for convenience we shall refer to as a manually operated device, for heat sealing the mouth of a bag or package, such for instance as a Cellophane bag enclosing peanuts, confections, or the like; and the object of the invention is to provide mechanism which may be easily actuated by a light foot or hand pressure, or manually operated, and which when actuated will impart a heavy thrust to the sealing jaws which engage the mouth of the bag and serve to seal the same by the application of heat, or equivalent means.

The final sealing pressure being automatically imparted by electrically controlled mechanical means relieves the operator from the necessity of imparting a heavy thrust to the movable jaw member, and confines the operator's duties to the positioning of the bags or packages, and the duty of swinging the jaw under light foot or manual pressure into position where the final sealing thrust is mechanically imparted. For purposes of convenience we shall refer to a foot operation imparted by pressure on a foot treadle, although it will be understood that such a description is intended to include a like operation imparted by a handle or similar means.

Further objects and details will appear from the description of the invention in conjunction with the accompanying drawings, wherein—

Figure 1 is a front elevation of the machine showing the jaws in open relation to receive a package;

Fig. 2 is a sectional view taken on line 2—2 of Fig. 1 looking in the direction of the arrow and with the jaws open;

Fig. 3 is a similar view showing the jaws in closed relation and in preparation for the final sealing thrust which is imparted by toggle mechanism;

Fig. 4 is a similar view showing the toggle mechanism actuated to impart the final sealing thrust;

Figs. 5, 6, and 7 are details illustrating the operation of a mercury switch in various positions of adjustment;

Fig. 8 is a perspective view of the top of a bag or package sealed and crimped by the mechanism of the present invention;

Fig. 9 is a detail taken on line 9—9 of Fig. 4;

Fig. 10 is a front view of a modified form of crimping jaw; and

Fig. 11 is a perspective view of an uncrimped package of the character acted upon by the jaws of Fig. 10.

The mechanism of the present invention is

housed within a hooded frame 10 comprising a base portion 11, a neck portion 12, and a dome-shaped head 13, the frame being enclosed at its ends by end walls 14.

The frame is open at its forward end to afford a mouth defined on its lower side by a chin-like wall 15 extending upwardly and outwardly from the base 11, and terminating in a lip 16 which carries a fixed jaw comprising inner and outer jaw bars 17 and 18 respectively. The outer jaw bar houses a heating element 19 controlled by a thermostat 19^a, and its outer face 20 is vertically corrugated to afford a series of serrations 21 adapted to crimp the margin of the bag or package.

The fixed jaw cooperates with a movable jaw consisting of an inner jaw bar 22 and an outer jaw bar 23 which houses a heating element 24. The movable jaw bar is likewise corrugated to afford a series of serrations 25 which register with the serrations of the fixed jaw bar when the edges are brought together.

The movable jaw member is carried by an arcuate rocking frame comprising end walls 26 and a cylindrically rounded body wall 27. The rocking frame is fixedly mounted upon a shaft 28 which mounts a drum 29, which is freely carried by the shaft and has the end of a chain or cable 30 attached thereto, so that as the chain or cable is drawn downwardly by a link 31 the drum will be rotated.

The drum stands in adjacent relation to a disk 32 which is pinned to the shaft and connected to a lug 29^a on the drum 29 through the medium of a coil spring 33 which passes through a notch 34 in the disk. The arrangement is such that when the chain or cable is drawn downwardly the drum will be rotated and, through the medium of the spring 33, will rock the shaft and the upper jaw frame carried thereby.

In order to counterbalance the weight of the upper jaw bars 22 and 23, so as to permit the parts to be rocked with but a slight expenditure of effort, a coil spring 35 is attached at one end to the inner edge of the rocking frame and attached at the other end to the base of the fixed frame.

The final sealing thrust under heavy pressure is imparted by a toggle assembly, which comprises an inner arm 36 pivoted to an adjustable block 37 at its rear or outer end, and to a longitudinally extending channeled thrust bar 38 at its inner end. The inner toggle arm cooperates with an outer toggle arm 39. The toggle assembly above described is duplicated at each end of

the thrust bar 38, and also at intermediate positions if desired, as indicated in dotted lines in Fig. 1.

The outer toggle arm 39 is tapered at its tip end 40, which, when the rocking frame has been swung by foot power to sealing position, will stand in adjacent relation to but above a notched block 41 located at the rear or inner side of the swinging frame, so that, as the toggle assembly is spread from the position indicated in dotted lines in Fig. 4 to the full line position there shown, the tip end of the outer toggle arm will engage and impart a thrust against the notched block 41, thereby imparting a heavy sealing pressure to the movable jaw bars, which, being heated, will crimp and seal the interposed folded edge of the bag or package.

The spreading of the toggle arms is effected by an armature rod 42 which enters a solenoid coil 43, so that, as the solenoid is energized, the armature rod will be drawn upwardly as in Fig. 4, to effect a spreading of the toggle members. In order to compensate for the arcuate movement of the rear or inner toggle arm in thus spreading the toggle assembly, the solenoid, or group of solenoids, is mounted within a bracket 44 carried by pivots 45 secured to a convenient portion of the fixed frame.

When the solenoid, or group of solenoids, as the case may be, is deenergized, the weight of the thrust bar 38 will cause the toggle assembly to drop back to broken or folded position as in Fig. 2, and until the movement is arrested by a conveniently located stop 46. In thus dropping back to the lowermost position, the tip end of the outer toggle arm will swing upwardly to release the rocking frame, which will be swung back to open position by the pull of the spring 35 which possesses sufficient tension to overcome the weight of the movable jaw bars and associated parts.

The mechanism for energizing the group of solenoids will now be described: The drum 29 carries a cradle 49 which mounts a mercury switch 50, best illustrated in Figs. 5, 6 and 7.

Fig. 5 illustrates the depending position of the mercury switch when the movable jaw is completely open as in Fig. 2;

Fig. 6 illustrates the position of the mercury switch, still slightly tilted below the horizontal, which is the position occupied when the movement of the swinging jaw is arrested by contact with the mouth of the bag; and

Fig. 7 illustrates the final movement imparted to the drum against the tension of the spring 33, which shifts the position of the lug 29^a carrying the switch cradle, and imparts a final tilt to the mercury switch beyond the horizontal center position. This final tilt closes the switch, and through suitable circuit connections energizes the solenoid, or group of solenoids, which when energized serve to spread the toggles and impart an instant sealing and crimping pressure to the jaw members.

However, as soon as the foot or hand pressure is released, the drum will be drawn back by the spring 33 sufficiently to shift the mercury switch back to circuit breaking position, although the thrust bar 38 and the toggle arms will be caused to drop back to the lowermost position through the action of automatic circuit breaking devices now to be described, and irrespective of the maintenance of pressure on the foot treadle. This is desirable in order to avoid heating of the solenoids and the maintenance of the sealing and crimping pressure for a period longer than is

required in the sealing of the bag. These results are obtained by the provision of a secondary mercury switch 51 which is secured to a bell crank trip lever 52 mounted upon a pivot 53 carried by a depending bracket 54.

The trip lever is provided with a lower leg 55 and an upper leg 56. The tip end of the lower leg is so positioned that when the inner edge of the rocking jaw frame is in the open position shown in Fig. 2, it will contact and depress the tip of the trip lever, which holds the mercury switch 51 in tilted circuit closing position. The tip of the upper leg occupies a position above the thrust bar 38, being so disposed that it will be engaged at the terminus of the upward movement of the bar occasioned by the energizing of the solenoid, so that the final movement of the bar will swing the trip lever upwardly to the position shown in Fig. 4, which tilts the mercury switch 51 in the opposite direction, thereby breaking the circuit. The trip lever will then stand in circuit breaking position until the swinging jaw frame is opened by the release of pressure on the foot treadle, which again restores the trip lever to the circuit closing position shown in Fig. 2, at which time, however, the mercury switch 50 will be in circuit breaking position, so that no current will flow through the solenoid.

In order to assist in the dropping of the thrust bar 38, when the solenoid is deenergized, a spring 57 is provided, which is secured at its upper end to the outer toggle arm 39 and at its lower end to a convenient point of attachment, and to better guide the movements of the outer toggle arm, a stop pin 58 is provided which bears against the upper tip edge of the toggle arm.

With the parts constructed as above described, the depression of the foot treadle (or hand lever as the case may be) will swing the movable jaw down into adjacent relation to the fixed jaw, so that the edges of the bag mouth will be heated in preparation for the application of the crimping and sealing pressure. An additional pressure sufficient to overcome the tension of the spring 33 will impart a supplemental movement to the drum 29 which tilts the mercury switch 50 sufficiently to close the circuit at this point. The secondary mercury switch 51 will at this instant stand in circuit closing position, so that a complete circuit through the solenoid will be established, thereby energizing the solenoid and lifting the armature rod 42, which spreads the toggle assembly and imparts a heavy sealing and crimping thrust to the movable jaw. The terminus of this movement, however, has the effect of lifting the trip lever 52, which tilts the secondary mercury switch into circuit breaking position, so that, immediately after the application of the sealing and crimping pressure, the toggle will be broken and the sealing pressure relieved. In this way the jaws will be subjected to an instant sealing thrust which suffices to seal and crimp the bag, but without maintaining the pressure on the jaws, thereby preventing overheating of the solenoids and obviating the danger of overheating the mouth of the bag by unnecessarily prolonging the application of the sealing pressure.

It will be understood that the jaw bars may be made of any desired length, and that the toggle assembly may be duplicated or multiplied to any extent desired to distribute the upward pull imparted to the toggle bar in any desired manner, depending upon the length of the bar and the amount of sealing pressure desired.

It has also been found that it is desirable to

provide for the discharge of heat from beneath the dome-shaped head of the fixed frame, which is therefore provided with rows of perforations or apertures suitably located above the row of solenoids.

The device as a whole is simple and rugged in construction, and compact and convenient in arrangement, so that the filled and folded packages may be moved or fed rapidly along a depending guide bracket 59 or the like, until they reach a position which brings the folded mouths of the bags into register with the fixed jaw and in position to be sealed and crimped.

In Fig. 10 we have shown a modification in the configuration of the jaws as an example of the extent to which they may be modified in shape to seal and crimp wrappers of various configurations. As shown, the outer jaw bar 18^a is provided with serrations 21^a, and terminates at each end in an outwardly extending leg 21^b provided with serrations 21^c. The fixed jaw cooperates with the movable jaw, having an outer bar 23^a provided on its face with a series of serrations 25^a and terminating at its ends in outwardly projecting legs 25^b provided with serrations 25^c.

Fig. 10 shows the movable jaw in its lifted or open position, and the arrangement of the legs on the fixed and movable jaws is such that they will register with one another when the movable jaw is closed, in the manner heretofore described, so that a crimping and sealing pressure will be applied around three sides of a wrapper of the character shown in Fig. 11, which is simply in the form of a sheet U folded around a package P, so that the margins of the wrapper will project beyond the ends and top of the package, which may be positioned by hand, as shown in Fig. 10, with the marginal portions overlapping the crimping surfaces of the fixed jaw, and in position to be crimped and sealed around three sides by the action of the movable jaw. Aside from the special configuration of the jaws shown, the mechanism is identical with that heretofore described.

It will be understood, however, that Fig. 10 is intended merely to illustrate the principle involved which permits of any desired variation in the configuration of the jaws, which may be of curving or arcuate formation instead of straight or angular, depending upon the particular formation of the package wrapper which it is desired to seal.

The jaw arrangement shown in Fig. 10 is one which affords an interior space or clearance within the surrounding jaw within which the operator may place his hand in holding the package without danger of injury when the movable jaw is lowered.

The device of the present invention may be employed in association with any suitable means for filling the packages and folding the mouths thereof in cases where folding is required, but such filling and folding devices form no part of the present invention.

Although the invention has been described with particularity as to detail, it is not the intention to limit the same in respect to the specific details shown for purposes of illustration, since the form an arrangement of the movable and fixed jaws and associated parts, and the method of mounting the toggle assembly, may be changed or modified without departing from the spirit of the invention; nor is it the intention to limit the invention to one in which heat is necessarily employed for sealing purposes, since the jaw mech-

anism and the means for operating the same may be employed in cases where jaws are employed without relation to the sealing function.

We claim:

1. In mechanism of the class described, the combination of a fixed jaw member and a pivotally mounted movable jaw member adapted to swing toward and from the fixed jaw member, manually operated means for swinging the movable jaw member toward the fixed jaw member, a toggle assembly adapted to impart a final thrust to the movable jaw member to bring the same into compressive relation with the fixed jaw member, and electrical means automatically energized by the approach of the movable jaw member to the fixed jaw member for actuating the toggle assembly, said means including a mercury switch movable with the movable jaw member and mounted thereon in a manner to permit a supplemental terminal movement imparted thereto to close the switch, and a solenoid adapted to be energized by the closing of the switch to actuate the toggle assembly.

2. In mechanism of the class described, the combination of a fixed jaw member and a pivotally mounted movable jaw member adapted to swing toward and from the fixed jaw member, manually operated means for swinging the movable jaw member toward the fixed jaw member, a toggle assembly adapted to impart a final thrust to the movable jaw member to bring the same into compressive relation with the fixed jaw member, and electrical means automatically energized by the approach of the movable jaw member to the fixed jaw member for actuating the toggle assembly, said means including a switch member movable with the movable jaw member, a solenoid adapted to be energized by the closing of the switch and an operative connection between the solenoid and the toggle assembly for spreading the latter when the solenoid is energized, and a secondary switch normally standing in circuit closing position and positioned to be moved to circuit breaking position by the final actuation of the toggle assembly to deenergize said electrical means.

3. In a mechanism of the class described, the combination of a frame, cooperating jaw members, carried by the frame, at least one of which is movable with respect to the other, manually actuated means for bringing the movable jaw member into proximate relation to the cooperating jaw member, toggle means including toggle arms interposed between the frame and the movable jaw member and adapted when spread to exert a final thrust on the movable jaw member to establish a compressive action between the jaws, and means electrically actuated by the advance of the movable jaw member for automatically operating the toggle mechanism to spread the toggle arms as the jaws are brought into adjacent relation to one another.

4. In mechanism of the class described, the combination of a frame, a fixed jaw member, and a movable jaw member both carried by the frame, a shaft journaled within the frame and fixedly carrying the movable jaw member, a drum freely mounted upon the shaft, manually actuated means for rotating said drum, a yielding connection between the drum and the shaft, a toggle assembly interposed between the frame and the movable jaw member and adapted when spread to impart a compressive thrust to the movable jaw member, a switch carried by the drum and rotatable therewith and mounted there-

on in a manner to permit the switch to be closed by a supplemental terminal movement of the drum, and a solenoid carried by the frame and adapted to be energized by the closing of the switch and means actuated by the solenoid for spreading the toggle assembly.

5. In mechanism of the class described, the combination of a frame, a fixed jaw member, and a pivotally mounted movable jaw member, both carried by the frame, the movable jaw member being adapted to swing toward and from the fixed jaw member, manually-operated means carried by the frame for swinging the movable jaw member toward the fixed jaw member, a toggle assembly including toggle arms interposed between the frame and the movable jaw member and adapted when spread to impart a final thrust to

the movable jaw member to bring the same into compressive relation with the fixed jaw member, a solenoid carried by the frame and provided with an armature rod engaging the toggle assembly and electrical connections actuated by the advance of the movable jaw member and adapted to effect energizing of the solenoid upon the approach of the movable jaw member to the fixed jaw member for actuating the toggle assembly to impart a final compressive movement to the movable jaw member, a normally closed secondary switch in the electrical connections for the solenoid and means operable during the terminal movement of the armature bar for opening the secondary switch to deenergize the solenoid.

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