

March 31, 1959

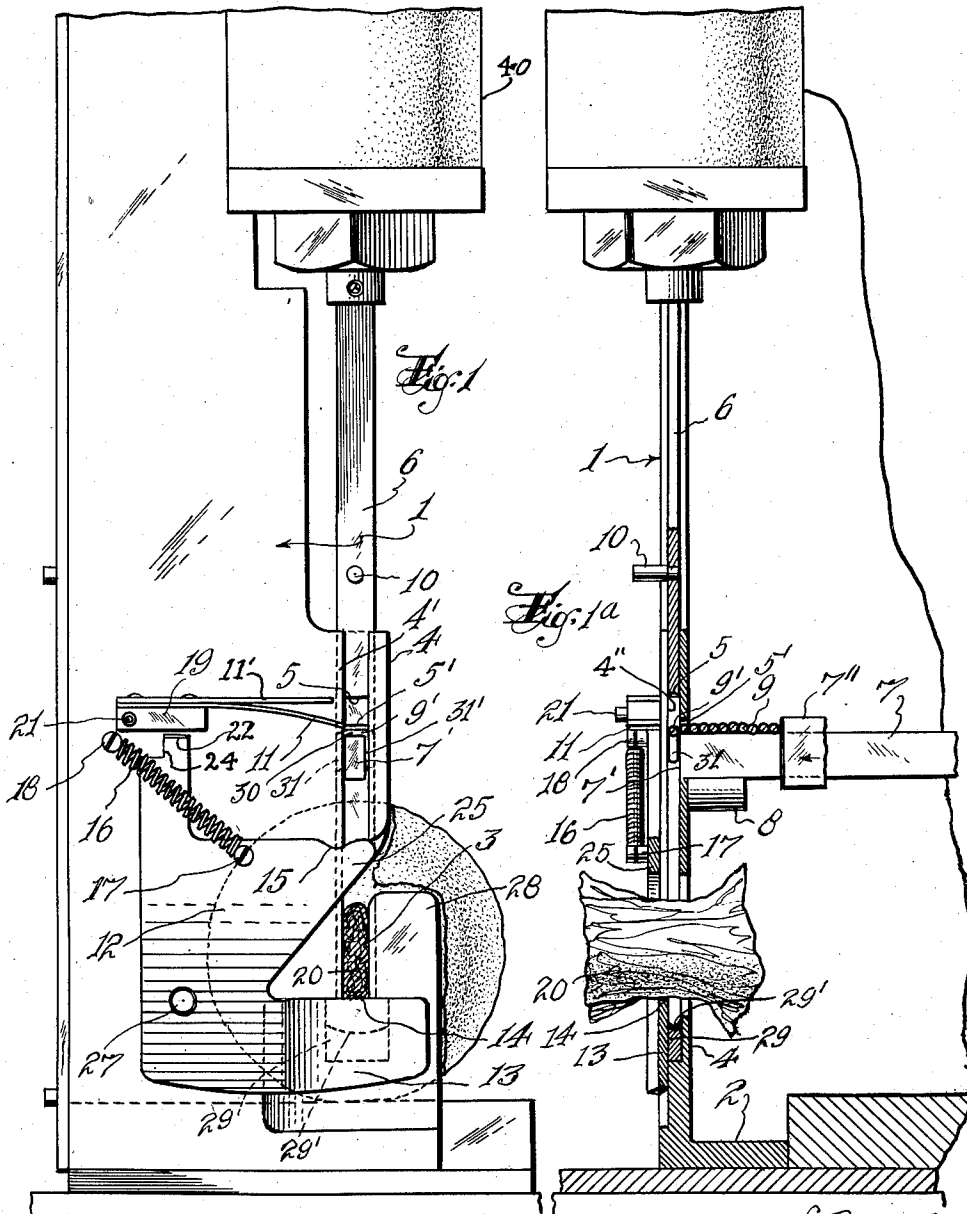
M. J. G. TIPPER

2,879,512

CASING CLOSURE AND CLOSING APPARATUS

Filed Feb. 4, 1957

4 Sheets-Sheet 1



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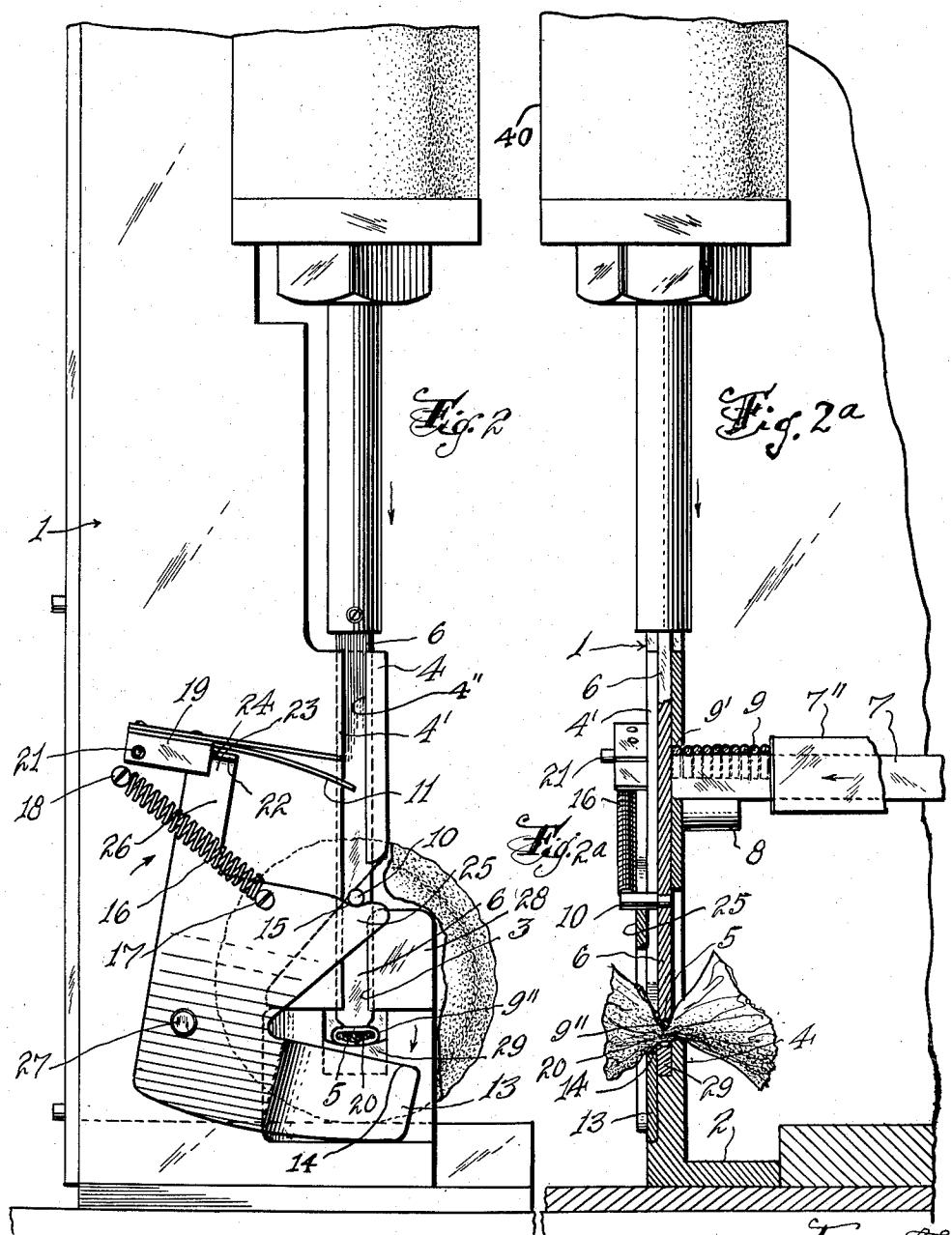
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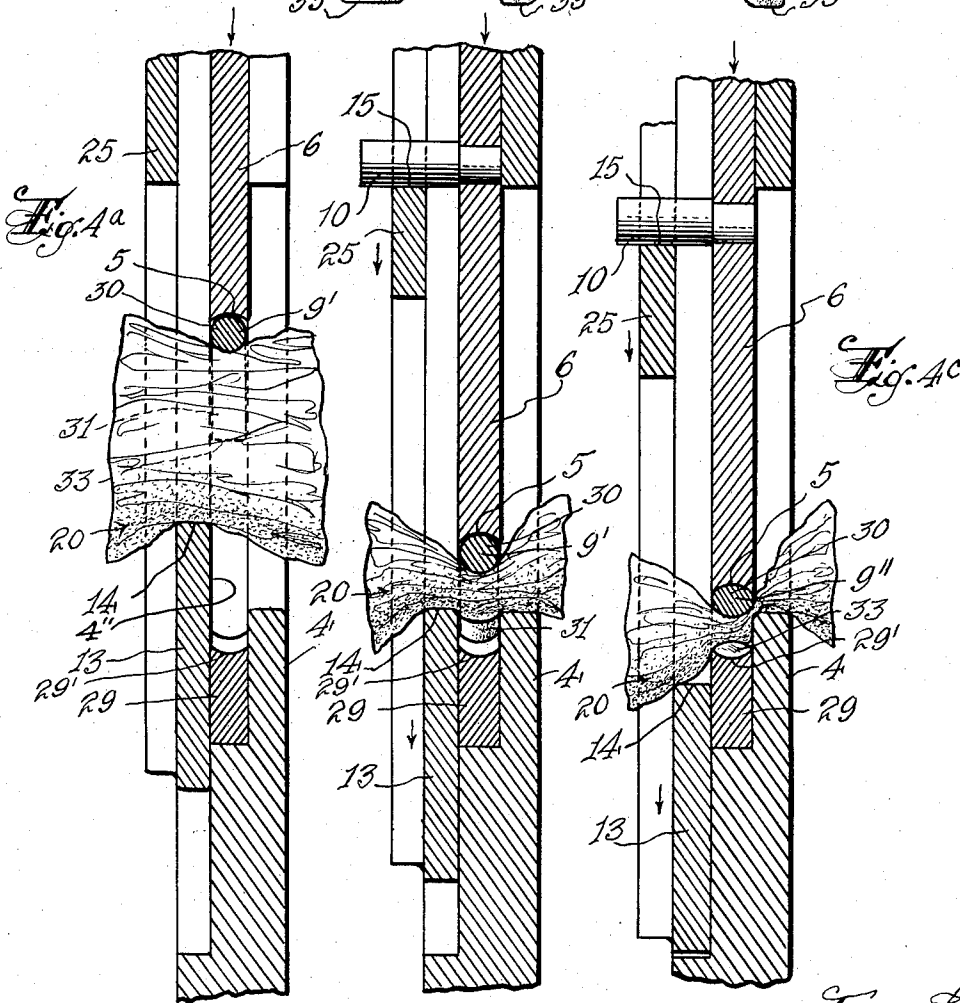
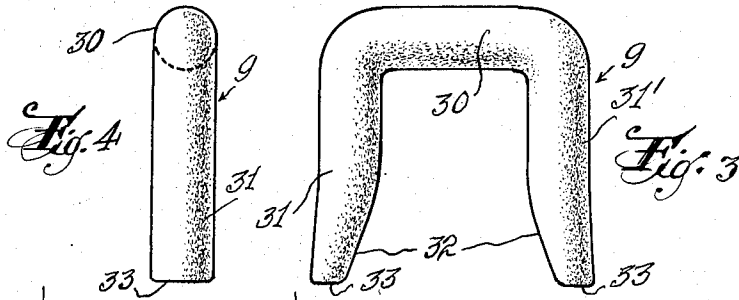


Fig. 4^b

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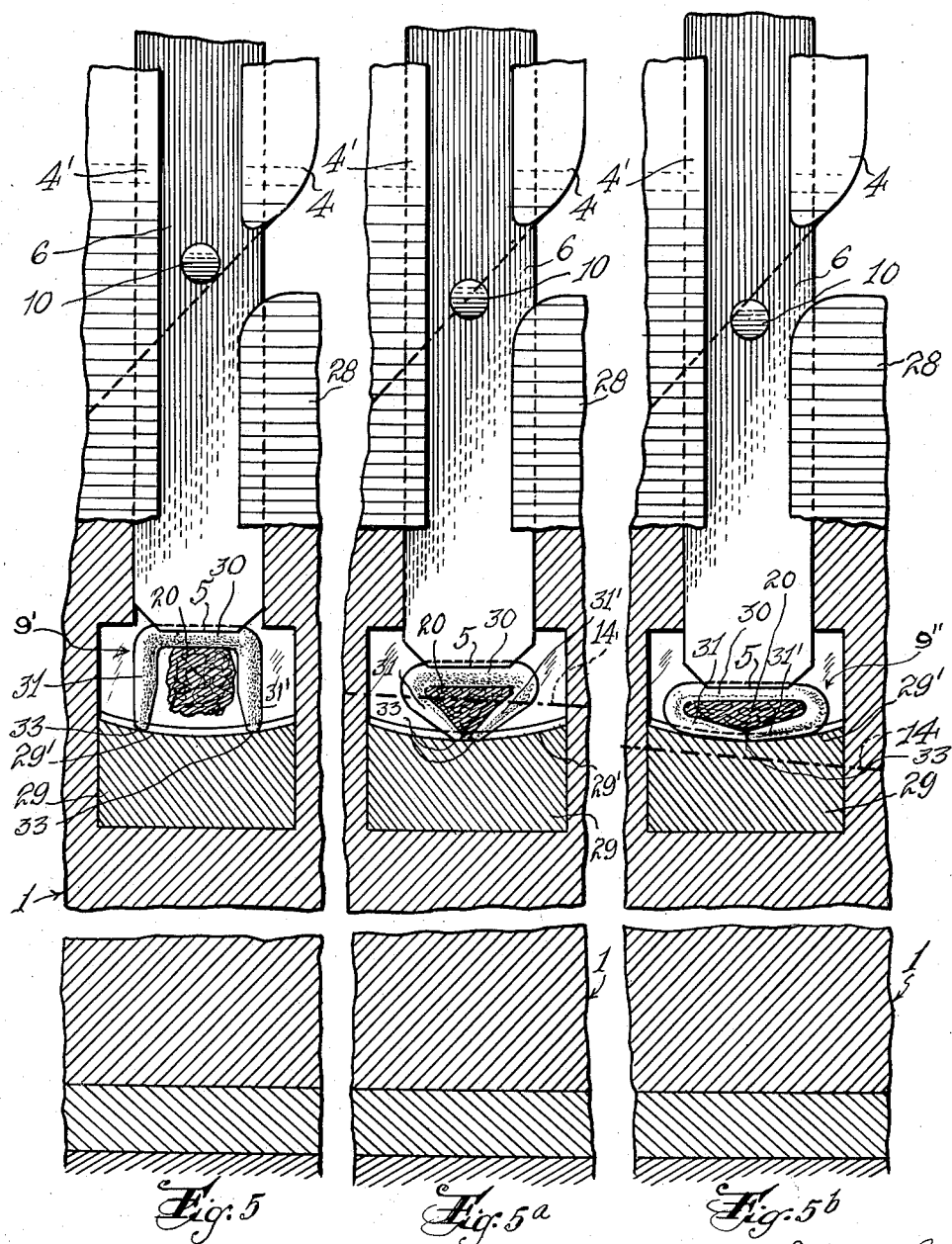
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4 Sheets-Sheet 4



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CASING CLOSURE AND CLOSING APPARATUS

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1 Claim. (Cl. 1—187)

This invention relates to the closing and sealing of containers such as bags and casings. More specifically, it deals with a machine for closing such containers and sealing them by clinching the ends thereof with a staple-like closure.

In the sausage industry, there is involved the closing and fastening of one end of the casing when the casing is dry and before it is stuffed. A number of different fastening and sealing machines and fasteners are now available for effecting such fastening. After the sausage is stuffed it is necessary to fasten the other or "wet" end of the casing and, usually, the means employed for the "dry" end are not effective for this purpose, and most sausages have been hitherto fastened by hand tying with string. The present invention eliminates such string tying and now particularly enables the automatic machine fastening of the "wet" end as well.

The invention will be more readily understood by reference to the accompanying drawings in which Figure 1 illustrates a side view of the essential features of a preferred embodiment of the invention in idle condition with a portion of the stuffed casing removed. A front view thereof, partly in cross-section, is depicted in Figure 1a. Figure 2 shows a side view of the unit of Figures 1 and 1a in the process of fastening the end of the casing, while Figure 2a presents a front view of the unit of Figure 2, partly in cross-section. Figures 3 and 4 show front and side views, respectively, of the staple or staple-like fastener employed to effect the closure and sealing. Figures 4a, 4b and 4c are cross-sectional front views of the closing mechanism, as enlarged, showing successive steps in the casing fastening operation, while Figures 5, 5a and 5b are side views, partly in cross-section, of the elements depicting successive steps undergone by the fastener during the crimping operation. Similar numerals refer to similar parts in the various figures.

Referring again to the drawings, numeral 1 represents the vertical support attached to base 2. Mounted in the upper portion of support 1 is vertically-reciprocated upper die or driver 6 having tip 5 for exerting pressure upon staple fasteners 9 and 9'. Extension 28 of the lower portion of support 1 has a vertical cut out portion or channel 3 into which the casing end 20 is inserted. Over the bottom of opening 3 is disposed a lower die 29 having a concave-curved and grooved upper edge 29'. The groove is apparent from Figures 4a-4c, while the concave shape is observed in Figures 5-5b. Channel 4" (Fig. 2) enables fasteners 9 and 9' to fall upright (i.e., with legs down) and be held therein ahead of die tip 5, the prongs 33 (Fig. 3) of the fastener eventually ending in standing position on lower die surface 29'.

Gate 13 is a flat metal sheet pivoted on support 1 at 27 and its upper outwardly-turned edge 22 is lockable at slot 24 against the right edge of triggering mechanism 19 when the gate is pushed down by die 6 as in Figure 2. Spring 16 having one end attached to stand 1 at 18 and its other end to gate 13 at 17 is tensioned so that slot 24

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and turned edge 22 of gate end 23 are pulled under triggering mechanism 19 (which is pivoted at 21) when the machine is in idle position as in Figure 1. In such case, gate edge 14 is horizontally disposed above lower die edge 29' as in Figure 4a.

Projecting end 25 of gate 13 projects over channel 4" formed by members 4 and 4', in which channel rides pin 10 attached to upper die 6. This pin contacts projection 25 of gate 13 at 15 after engaging trigger 11 of triggering mechanism 19 (which latter operation has no effect at the time on gate 13). When pin 10 contacts gate end 25, it pulls down gate 13 and member 19 drops in slot 24, so that bent edge 22 is locked against the right end of slot 24 as in Figure 2.

A fastener feed bar 7 is provided to feed into channel 4" sticks of fasteners (which preferably are fasteners glued together side-by-side in stick form). Bar 7 is attached to support 8 projecting from stand 1. Spring-tensioned thrust member 7" is disposed over bar 7 to push fasteners 9 into channel 4" as they are removed by upper die 6.

The purpose of gate 13 is to hold casing end 20 above lower die 29 until fastener 9' falls over it, encompasses the sides thereof and its ends are butted together prior to the final crimping, so that no injury occurs to the casing by penetration of prong tips 33 (Fig. 3) of the fastener. This is illustrated by Figures 4a-4c wherein upper edge 14 of gate 13 is above curved edge 29' of lower die 29 when the machine is in idle position as in Figure 4a. Fastener 9' is pushed down channel 4" by bottom edge 5 of driver 6. Gate edge 14 holds casing end 20 while die 6 pushes down fastener 9' and compresses the casing between fastener prongs or legs 31. When prong tips 33 reach die edge 29', as in Figure 5, the casing is completely encased within the fastener and the legs of the fastener are butted. When pin 10 on die 6 reaches part 15 on projection 25 of gate 13, gate edge 14 is pushed below edge 29' of die 29, allowing casing end 20 to drop over lower die edge 29' as driver edge 5 provides the final crimp to the top of fastener 9' the prongs 33 of which already are butted inwardly as in Figures 4b and 5a. At the end of the downward stroke of driver 6, the fastener (now in condition 9') practically completely encircles casing 20 and is finally crimped thereon as in Figures 4c and 5b. Thereafter, driver 6 begins its upward movement (it being operated by compressed air cylinder 40, with foot control, not shown).

As driver 6 begins its upward movement, fastened casing 20 is removed and the cycle is in preparation for repetition. When pressure of pin 10 is removed from gate 13, spring 26 retracts gate 13 and when pin 10 raises trigger 11 against supporting bar 11, it raises mechanism 19 and allows turned end 22 of gate portion 23 to be pulled (by spring 16). Gate edge 14 thus is held down during the return stroke, allowing the operator to remove the fastened casing by a sidewise motion before the gate is raised by pin 10. The length of time for which the gate is held in lowered position is controlled by a metering valve (not shown) in the air exhaust line from piston cylinder 40. After the die edge 5 has passed edge 7' of bar 7, thrust element 7' pushes another fastener over edge 7' into channel 4" (Fig. 1a), which fastener is ready to be stripped off the stick of fasteners by driver edge 5 on its next downward movement when the cycle is repeated.

Fastener 9 (Figs. 3-4) is preferably of staple-like shape and is made of relatively soft metal such as aluminum. It is of inverted U-shape and has a straight body 30 from which extend downwardly two blunt prongs or legs 31-31' which have a relatively straight outer surface, but which have an inner taper 32 and terminate in a flat

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point or end 33. The outer surfaces of prongs 31—31' are slightly farther apart (about 7–8%) at ends 33 than at their upper portions which greatly facilitates the feeding and fastening operation. When the fastener is in completely crimped position as in Figure 5b, ends 33 are practically butted against each other.

I claim:

A machine for fastening a gathered end of a flexible container with a two-pronged staple fastener, comprising a base, a vertical support on the base having a guide channel therein, a driver vertically reciprocable in the channel for clinching a staple onto said container, a pin on the driver spaced from its staple engaging end, means disposed adjacent the bottom of said channel to gather the end of a flexible container, a staple magazine for feeding a staple into said channel below said driver, a clinching die disposed below said gathering means and having a concave-curved, grooved edge on which a staple is clinched by said driver, a gate pivotally mounted on

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said support adjacent said channel and resiliently held in a position with a horizontally projecting edge disposed above said die to hold up said container end off said die while a staple is encircling said container end, and an arm connected with said gate and extending over said gathering means and engageable by said pin on the driver during its downward stroke to pivot said gate and drop said edge below the die and thus permit the driver to completely clinch the staple around the gathered container end.

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