

March 1, 1949.

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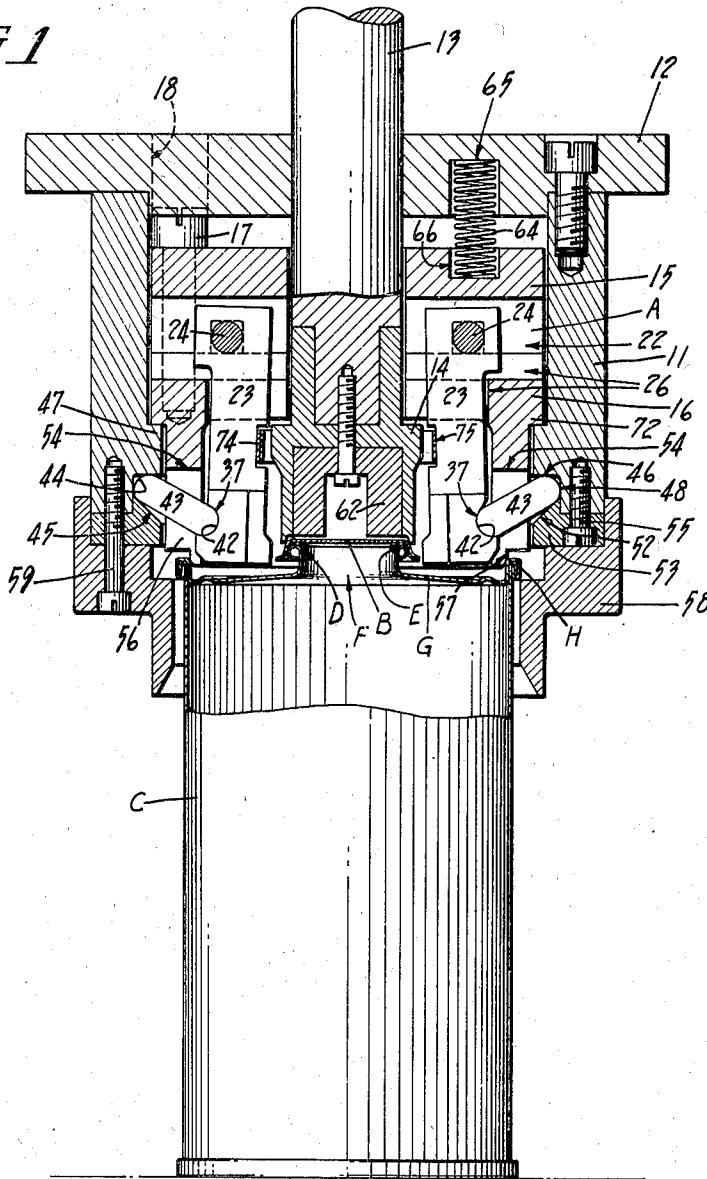
2,462,928

SEALING HEAD MECHANISM

Filed June 11, 1946

3 Sheets-Sheet 1

Fig 1



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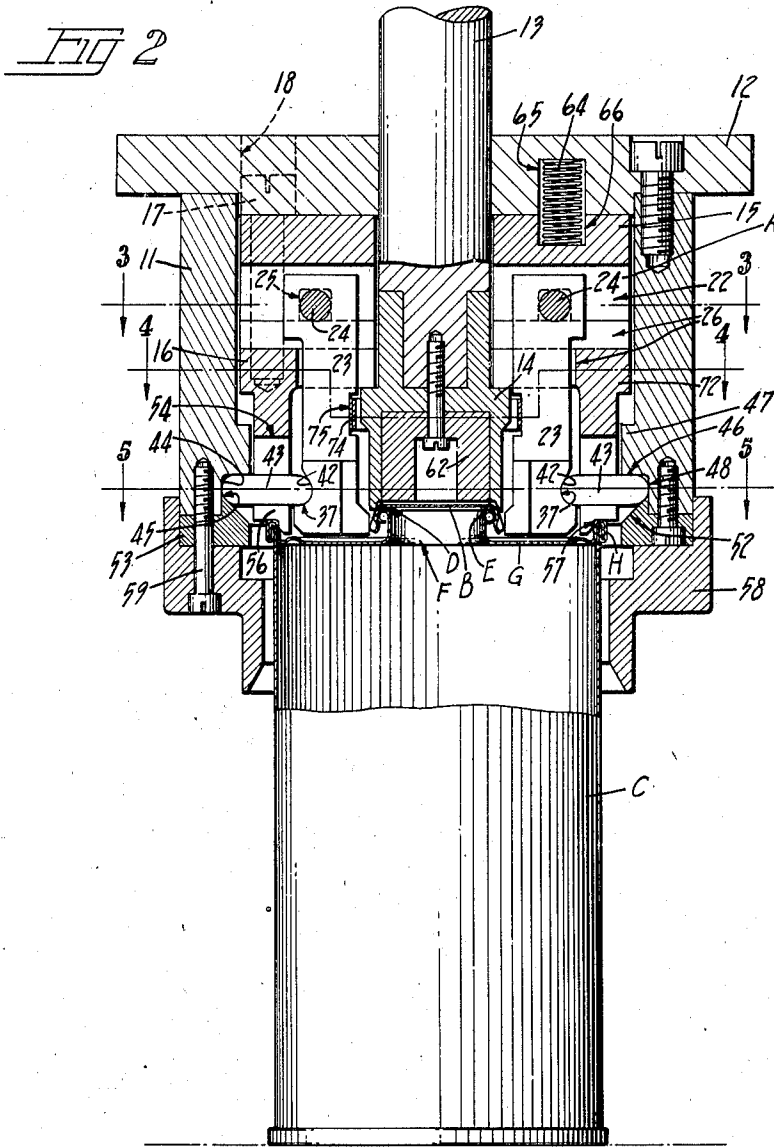
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FIG 6

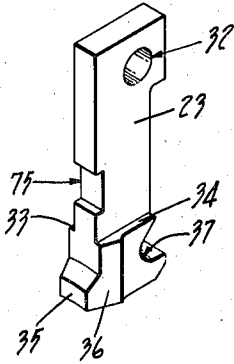


FIG 3

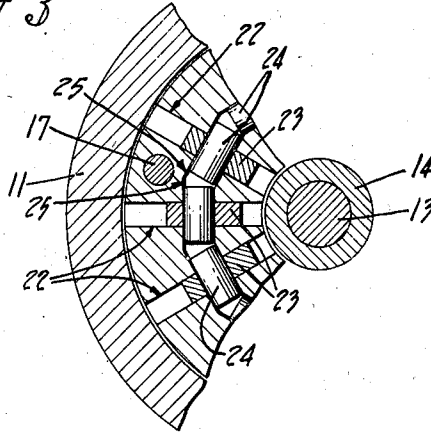


FIG 4

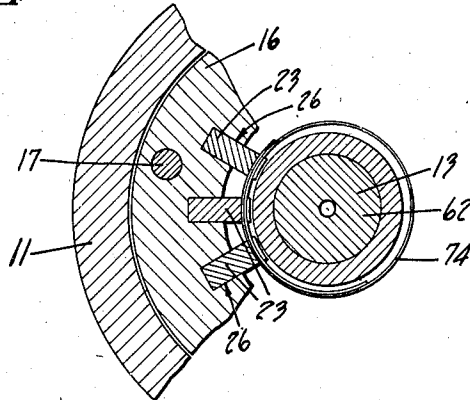


FIG 7

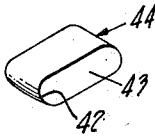
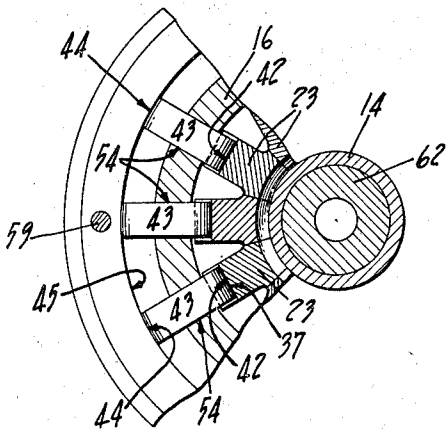


FIG 5



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SEALING HEAD MECHANISM

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3 Claims. (Cl. 113-18)

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This invention relates to a sealing head mechanism for sealing a cap closure onto a beaded neck outlining an opening or mouth formed in the end wall of a container and has particular reference to sealing mechanism which utilizes the surrounding spaced rim or end seam of such a container for crimping in and sealing the cap closure onto the neck.

An object of the invention is the provision of a sealing head mechanism which applies pressure against the end seam of a container to effect a circumferential crimping-in pressure against the periphery of a cap closure thereby forcing the edge of the cap beneath the beaded edge surrounding the mouth to seal the cap onto the container.

Another object of the invention is the provision of a sealing head mechanism having a magnetic capping head for holding a cap closure in place on the container while parts of the sealing mechanism engages the end seam of the container and bring into operation other parts of the mechanism for crimping the cap closure into sealing position.

A further object of the invention is the provision of a sealing head mechanism of the character described having a capping head for holding crown cap closures in sealing position on a beaded neck of the container and having sealing jaws encircling the capping head these jaws being movable inwardly to crimp the crown cap in sealed position when the end seam of the container is engaged by the sealing head mechanism.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Figure 1 is a vertical sectional view of a sealing head mechanism embodying the present invention, showing the sealing head parts in an open position;

Fig. 2 is a view similar to Fig. 1 showing the sealing head parts in a closed position as during an operating condition;

Figs. 3, 4 and 5 are fragmentary sectional views taken substantially along the straight line 3-3, the broken line 4-4 and the straight line 5-5, respectively, in Fig. 2;

Fig. 6 is a perspective view showing the details of a sealing jaw; and

Fig. 7 is a view similar to Fig. 6 showing the details of a toggle element.

As a preferred embodiment of the invention

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the drawings illustrate a sealing head mechanism which may form part of a closing machine but which for the purpose of disclosure will be considered separately as an independent head. The instant mechanism includes a carrier unit A adapted for operation upon a cap closure B when it has been positioned on a container C. The sealing head mechanism is used to secure the closure on the container. The carrier unit A is shown in an open position in Fig. 1 and in a closed position in Fig. 2 both positions of the unit including the can and cap in proper relation for sealing.

Carrier unit A is movable within a housing 11 which is secured to a housing plate 12. Such a housing plate may be secured to or form a part of a more elaborate closing machine. Carrier unit A surrounds a centrally disposed plunger 13 which is movable independently of this unit. Plunger 13 carries a capping head 14 which is secured to its bottom end.

Carrier unit A includes an upper annular block 15 and a lower annular block 16. These blocks are secured together by machine screws 17. There are six such screws equally spaced and the heads of these screws extend into clearance openings 18 located in the housing plate 12. This permits axial movement of the carrier unit A but prevents the unit from turning within the housing 11.

The upper annular block 15 is slotted radially as at 22 (Figs. 1, 2 and 3). It is within these slots that sealing jaws 23 are movable. There are twelve slots, one for each of the sealing jaws. The sealing jaws 23 are carried on pivot pins 24. These pivot pins are disposed in a polygonal recess 25 surrounding the plunger 13 (Fig. 3). The sides of each section of the recess is at right angles to each of the slots 22. Thus there are twelve pins one for each of the twelve sealing jaws 23.

The sealing jaws 23 extend down through the lower annular block 16 which for this purpose also is slotted radially as at 26 (Figs. 1, 2 and 4). The slots 22, 26 are vertically aligned for free movement of the sealing jaws 23 within their slots.

Each sealing jaw 23 is in the form of an elongated member (Fig. 6) having a circular opening 32 near its upper end. This opening provides a pivotal seat for the pivot pin 24. At the lower end each sealing jaw is broadened being formed with integral projecting sides 33, 34. Each sealing jaw also extends inwardly along its front or inner side adjoining its lower end in a

circular working face 35. The inner edges of the sides 33, 34 are tapered as at 36 providing adjoining corners for the inner circular face 35. This enables each jaw to abut adjacent jaws and together to form a completely encircling crimping chuck for a pressing or crimping operation.

The outer side of each sealing jaw 23 is provided with a groove 37 adjacent its lower end for the reception of a rounded end 42 of a toggle element 43 (Fig. 5). Such a toggle element is substantially key shaped having a matching circular and rounded opposite end as at 44 (see also Fig. 7). It is this opposite circular and rounded end that engages in an annular pocket 45 (Figs. 1 and 2) in the lower end of the housing 11.

The pocket 45 is outlined by a top wall 46 formed in a projecting shoulder part 47 at the bottom of the housing and by a circular side wall 48 which merges with a sloping wall 52 of an annulus 53. It is the annulus 53 that retains the toggle elements 43 in the housing. The toggle elements have rocking movement in radial slots 54 formed in the lower portion of the annular block 16 (Figs. 1, 2 and 5). Slots 54 are wider than the slots 22, 26 since the toggle elements 43 are the same width as the lower or broader parts of the sealing jaws 23. Cap screws 55 hold the annulus 53 on the bottom of the housing 11.

The bottom face of the lower annular block 16 is formed in the shape of a chuck 56 and it functions as such having a profile 57 for aligning a container within the capping mechanism. Preferably a ring 58 is provided for guiding the can C into proper sealing or capping position in the mechanism. Ring 58 is located at the bottom of the annulus 53 and when such a ring is used screws 59 passing through the latter secure both annulus and ring to the housing 11. In this way the annulus is held in addition to the primary holding means, i. e., the screws 55.

The instant mechanism may be operated either by moving the mechanism relative to the can and cap closure as when such an assembly is held stationary on a platform or when the can and closure assembly is raised as by a conventional form of lifter plate or plunger. Fig. 1 of the drawings illustrates the can with its closure cap in position inside the ring 58 preparatory to engagement with the chuck 56 of the carrier unit.

The cap closure B preferably is of the crown cap variety. The cap also is provided with a gasket or lining D on the inner surface so that a hermetic seal may be formed when the cap is secured to the can. The crown cap when it is assembled with the can (Figs. 1 and 2) is in place upon a beaded rim E bordering a mouth F of a container end G. Such an end has been secured to the can in an end seam H. End G is herein disclosed as having been formed with a slight upwardly extending domed shape.

The can is brought into the mechanism for assembly with the cap by lifting the can or by lowering the mechanism for a capping operation. At such time the crown cap closure and the capping head are in engagement and the can end seam H and the chuck 56 are also in engagement. The crown cap B previously has been placed in sealing position within the mechanism in any suitable manner. A magnet 62 carried in the capping head and secured to the plunger 13 holds the cap within the mechanism.

After the can and crown cap have been brought together in the position just described, axial pressure is applied against the end seam H by the chuck 56. This effects movement of the car-

rier unit A within the housing 11, resulting in a crimping action. Such movement is directed against a plurality of springs 64 (Figs. 1 and 2) which are located in bores 65 in the housing plate 12 and in bores 66 in the upper annular block 15. There are six such pairs of bores for an equal number of springs and the springs are disposed intermediate the screws 17 and the openings 13.

Thus, as the carrier unit A moves up within the housing 11, the plunger 13 also moves up carrying with it the capping head 14. The instant mechanism may be so adjusted that only a slight pressure will be directed against the crown cap B to keep it in a seated position on the beaded rim E bordering the mouth F of the container. Such a pressure preferably is sufficient to temporarily flex the domed shape can end G causing it to assume a substantially flat form. When the pressure is removed after sealing, the end returns to its domed shape.

During the capping or sealing operation the carrier unit A with its associated parts, such as the sealing jaws 23 and the toggle elements 43, move from the position shown in Fig. 1 to that illustrated in Fig. 2. The carrier unit A at the termination of its upward movement, as disclosed in this latter figure, holds the parts in sealing position, the upper face of the annular block 15 engaging the lower face of the housing plate 12.

During this movement of the carrier unit A, a circumferential reaction is effective as an encircling pressure on the closure cap B. This seals or crimps the cap edge onto the mouth of the container. This crimping action is produced by the toggle elements 43. The inner ends 42 of the toggle elements rock in the grooves 37 and their outer rounded ends 44 pivot in the pocket 45. This action causes an inward movement of the lower ends of the sealing jaws 23 as they in turn swing on their pivot pins 24.

The working faces 35 of the sealing jaws thus form a completely encircling chuck, closing on and pressing in the skirt edges of the closure cap B. This crimps and fully seals the crown cap closure beneath the beaded rim E of the container F.

Following such a sealing or crimping operation the sealed container and the sealing mechanism are separated and the container is removed. At the same time the carrier unit A is returned to open position (Fig. 1) preparatory to receiving subsequent cans and cap closures for sealing.

In this return to open position the shifting of the carrier unit A within the housing 11 is brought about through the action of the springs 64. The carrier unit's full open position is determined by a shoulder 72 on the periphery of the lower annular block 16 engaging with the shoulder 47 formed on the inner wall of the housing (Fig. 1). The inner ends 42 of the toggle elements during such return to open position drop down and permit the sealing jaws to expand under action of a circular expansion spring 74 which surrounds the capping head 14. Such a spring operates in recesses 75 formed in the inner wall of the sealing jaws.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

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I claim:

1. In a sealing head mechanism for sealing a cap closure onto a container having a cap receiving neck in the end of the container surrounded by a spaced encircling rim, the combination of a housing, a carrier unit mounted for axial relative movement with respect to said housing and having a chuck section for engaging the said encircling rim for a cap sealing operation, a capping head disposed inside of said carrier unit for holding a cap closure on the container neck during sealing, sealing jaws pivotally mounted in said carrier unit and encircling said cap closure as it is held on the container neck by said capping head, and toggle means frictionally engaging opposite relatively movable portions of said housing and jaws for moving said jaws inwardly against said cap closure, when the housing is moved relatively to the carrier unit and the container.

2. In a sealing head mechanism for sealing a cap closure onto a container having a cap receiving neck in one end of the container surrounded by a spaced encircling rim, the combination of a housing, an annulus secured to the bottom of said housing and providing an annular pocket, a carrier unit in said housing mounted for axial movement with respect to said housing and having a chuck section for engaging said encircling rim, sealing jaws each pivotally mounted at one of its ends in said carrier unit and having its free end adjacent to and inside of said annular pocket, and toggle elements each seated at one of its ends in said annular pocket and engaging said sealing jaws at the other of its ends for moving said jaws inwardly against said cap closure when the housing is moved relatively to the carrier unit and the container.

3. In a sealing head mechanism for sealing a

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cap closure onto a container having a cap receiving neck surrounded by a spaced encircling rim, the combination of a housing, a carrier unit in said housing and axially movable relative to said housing, a chuck section formed at the bottom of said carrier unit for engaging said encircling rim, a capping head disposed inside of said carrier unit for engaging a cap closure and holding it on said cap receiving neck of the container during the sealing operation, sealing jaws pivotally mounted in said carrier unit and encircling the skirt of said cap closure when the latter is in sealing position on said capping head, sockets formed in oppositely disposed surfaces of said housing and sealing jaws, a plurality of toggle elements each element having rounded portions at opposite ends one rounded end portion being seated in a said housing socket and the opposite rounded end being seated in a said sealing jaw socket, and means in said carrier unit to retain said toggle elements in alignment with their respective sockets, said toggle elements moving said jaws inwardly against said cap closure when the housing is moved relative to the carrier unit and the container.

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