(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number : **0 117 663 B2**

(12) # NEW EUROPEAN PATENT SPECIFICATION

(45) Date of publication of the new patent specification : **24.03.93 Bulletin 93/12**

(51) Int. Cl.^{5} : **B65B 7/28**

(21) Application number : **84300748.5**

(22) Date of filing : **07.02.84**

(54) **Foil container closing apparatus.**

(30) Priority : **08.02.83 GB 8303449**

(43) Date of publication of application : **05.09.84 Bulletin 84/36**

(45) Publication of the grant of the patent : **09.09.87 Bulletin 87/37**

(45) Mention of the opposition decision : **24.03.93 Bulletin 93/12**

(84) Designated Contracting States : **AT BE DE FR GB IT NL**

(56) References cited :
EP-A- 0 071 130
EP-A- 0 091 813
CH-A- 380 630
DE-A- 2 935 479
DE-C- 2 252 927
DE-U-81 225 393
FR-A- 1 271 708
FR-A- 1 587 382

(56) References cited :
FR-A- 2 203 739
GB-A- 923 741
GB-A- 951 257
GB-A- 1 085 834
GB-A-12 201 54
US-A- 2 732 116
US-A- 2 826 026
US-A- 3 712 021
US-A- 3 834 120

(73) Proprietor : **Ekco N.V.**
Henry Ford Laan 60 P.O. Box 65
B-3600 Genk (BE)

(72) Inventor : **Noten, Rik**
Beesbosweg 5A
B-3670 Neeroeteren (BE)
Inventor : **Hensbroek, Bart**
Larikenstraat 9
B-3530 Houthalen (BE)

(74) Representative : **Chettle, Adrian John et al**
Withers & Rogers 4, Dyer's Buildings Holborn
London EC1N 2JT (GB)

EP 0 117 663 B2

Description

This invention relates to a closure die assembly for a machine for closing aluminium foil containers with an aluminium foil lid.

Aluminium foil containers are well known. One type of prior art foil container is in the form of a dish having a peripheral outwardly extending flange; the flange may be reinforced by folding the foil to double thickness. A foil cover is provided having a downwardly extending peripheral flange. The cover fits snugly over the container and the cover flange is turned under the container flange to retain the cover on the container. The cover may be crimped to the container flange to seal the contents therein.

Such containers are frequently used to package food; they are cheap, hygienic and have a good appearance.

For reasons of cleanliness and hygiene it is important that each container is accurately closed. Foil containers may be easily damaged or deformed during the closing process and it is important that a bad closure is detected. Damaged or deformed containers disrupt a flow line production and moreover, a bad closure cannot be rectified by replacing a badly fitting cover because of the fragile nature of the container, the contents of a damaged container are thus wasted.

Closure machines have been proposed to automatically secure foil covers to foil containers. Such machines can provide a secure repeatable closure with a low rejection rate.

German Patent DE-C-2511218 discloses a machine for automatically securing a foil cover to a foil container. The closure mechanism has upper and lower moving dies and operates in two stages. The upper die holds the cover onto the container and bends the cover edge flange vertically downward around the container flange; the lower die completes the closure urging a multipart frame assembly upwards and inwards to secure the cover to the container flange. The closure mechanism includes a separate crimping frame to crimp the folded edge of the container. This action seals the closed container and is especially desirable where the container contains hot foods and liquids.

Such a machine, in common with many other prior art proposals, is complicated and expensive to manufacture. The machine has many moving parts and must thus be made to a high specification to avoid breakdown. In a hot food kitchen any breakdown of the machine can seriously affect production and may prevent meals being prepared on time. Such kitchens are unlikely to employ technical staff able to effect repair to the mechanism.

Another disadvantage of prior art closing machines is that parts of the mechanism are disposed below the foil container. Food may be spilled or slopped from the container during the closing operation and accumulate in the operating parts of the mechanism. Such spillage is very difficult to remove effectively and may accumulate sufficiently to prevent correct working of the mechanism. Spillage may also pose a health hazard.

The complication of prior art closing machines results in the disadvantage that they are difficult to disassemble for cleaning and adjustment. It is also difficult to modify the mechanism to close containers of different size.

A further disadvantage of prior art closing machines is that a separate frame is required to crimp the edge of the closed container. Crimping is necessary to ensure the contents are sealed and to prevent leakage. Separate crimping apparatus increases the complication and expense of the closing machine.

European Patent Publication EP-A-0091813 is a prior art document under Article 54(3) and (4) EPC and discloses an improved closing mechanism having a single moving die which moves in successive stages. Initial movement of the die bends the flange of the cover downward around the container flange and the further movement of the die causes a multi-part frame assembly to bend the cover flange under the container flange and thus secure the cover to the container. The mechanism includes a separate crimping frame.

DE-U-81 22 539.3 discloses a closing mechanism in which the multi-part closing frame acts also as the crimping frame. Specifically this publication discloses a closure die assembly having a die frame and a closure die movable axially thereof in sequential closing and crimping stages. The closure die comprises a support frame having a support plate to hold a cover against a container and closure means comprising a multi-part frame assembly and movable transversely of the support frame to fold an edge flange of the cover under an edge flange of the container. In the closing stage, axial movement of the closure die bends the cover edge flange vertically downward and inward under the container edge flange.

In the subsequent crimping stage the support plate is movable axially of the support frame to cause the folded edge flange of the cover to be crimped between the support plate and the closure means. Thus a separate crimping frame is not required.

The arrangement has a number of disadvantages. The abutments which control the crimping operation are outside the multi-part die frame. The mechanism is therefore unduly bulky. The disclosed die is not adaptable to automatic operation in which a knife is used to shear aluminium foil sheet in the manner disclosed for example in EP-A-0091813 because the knife cannot be placed sufficiently close to the die to cut a cover the appropriate size. The crimping force of the die is not easily adjusted. The support plate for the foil cover does not hold the cover against the container during the closing stage but only during the

crimping stage.

The present invention seeks to provide an improved closing mechanism for securing foil covers to foil containers which substantially overcomes the aforementioned disadvantages. This is obtained by a closure die assembly having the features specified in claim 1.

The invention provides a separate assembly comprising the major working components of the closing mechanism and which includes means to crimp the folded edge of container and cover without a separate crimping mechanism. The assembly can easily be removed from a container closing machine for cleaning and adjustment and moreover the assembly may be interengageable with other closure die assemblies suitable for different size containers. A further advantage is that the closure assembly is disposed substantially above containers to be closed thus reducing the likelihood of food fouling the mechanism. The area below the containers is substantially clear of operating parts and thus spillages and slops may easily be dealt with.

The simplified closure assembly is thus generally more compact and robust than prior art closing machines.

Preferably resilient means, such as coil springs, oppose relative movement between the support frame and the support plate. The springs may urge the frame and plate into direct abutment. In one preferred embodiment guide means are provided to locate and guide the support plate relative to the support frame. The guide means may be hardened steel pins fastened to the support plate and journalled in sleeve bearings of the support frame. Return springs may be provided between the support frame and enlarged heads of the guide pins; the springs may be coiled compression springs disposed around the guide pins.

An abutment is provided between the die frame and the support plate to initiate relative axial movement between the support frame and the support plate. The abutment may be adjustable in order to allow initiation of relative axial movement to be varied.

The closure means preferably comprise four generally "L" shaped members arranged to form a rectangle and urged apart by springs located between adjacent free ends of the members. The members are movable inwardly of the support frame by ramp means of the die frame to fold the flange of the cover under the flange of the container. The ramp means may act directly at the corner of each "L" shaped member or act on the arms of the members.

Each frame member has a jaw to receive and fold an edge flange of the cover and each jaw preferably has an upstanding inner lip to crimp the folded edge of the flange. The jaw provides a re-entrant chamber to receive the extreme edge of the crimped flange outboard of the crimp line. In a preferred embodiment the support plate has a continuous upstanding peripheral lip for engagement with the upstanding lip of the frame members and between which the container flange is crimped. The upstanding lips may engage at an angle in order to provide a superior crimp action. The upstanding lip of the support plate is preferably triangular in section, the inner face of the lip co-operating with the lip of the frame members and the outer face of the lip forming a closing side of the re-entrant chamber of each jaw.

Other features of the invention will be disclosed in the following description of a preferred embodiment of the invention shown by way of example only in the accompanying drawings in which:-

Figure 1 is a transverse section through a prior art closing frame for a container closing machine;

Figure 2 is a cross-section of the closing frame along line B-B of Figure 1;

Figures 3 to 8 are end views partly in section showing sequential stages of operation of a prior art container closing machine;

Figure 9 is a plan view of the closure die assembly according to the invention and showing the assembly in two operating positions;

Figure 10 is a section through the assembly of Figure 9 on line A-A and including a part-section through the closing frame. The assembly is shown in open and closed conditions; and

Figure 11 is a section through the assembly of Figure 9 on line B-B and showing the assembly in open and partially closed conditions.

A prior art closing die will now be described with reference to Figures 1 to 8 in order to explain fully the operation of a typical container closing machine. Figures 1 to 8 are somewhat schematic.

With reference to Figures 1 and 2 there is shown a typical closing frame comprising four generally "L" shaped resilient members 11, preferably made of nylon, arranged to form a rectangle. The members are biassed apart by compression springs 12 acting between adjacent ends of the members 11. The springs may be partially located in recesses of the frame members.

A support frame 13 comprises a top plate 14 and support plate 15 spaced by distance pieces 16. The frame 13 locates and guides the frame members 11 for inward movement.

A die frame 17 has rigid guides 18 having ramp faces which act on corresponding faces of the frame members 11. The guides 18 are arranged in rectangular formation to act each on adjacent arms of two "L" shaped members 11.

Relative movement between the support frame 13 and the die frame 17 will urge the frame members 11 inward against the effect of the return springs 12. Return springs 19 are also provided between the die frame and support frame.

One or more guide pins 20 locate and guide the

support frame 13 relative to the die frame 17.

Referring now to Figures 3 to 8, the operation of the prior art die will be described.

A base frame 21 forms part of a lower die assembly which comprises a crimping frame 23 and an inner die frame 22 movable in the crimping frame. An ejector plate 24 has guide pins 25 located in journals of the base frame 21. Springs 26 act to urge the inner die frame 22 and base frame 21 apart.

An upper die assembly comprises an upper frame 27 to which the die frame 17 is attached by clamps 28.

Guideways 31 are provided for aluminium foil sheet 32 to be fed in a direction perpendicular to the drawing sheet as viewed. A knife comprising a fixed blade 33 and a movable blade 34 hinged to the fixed blade at pivot 35 cuts the sheet 32 on operation of the closure machine as will be described in further detail hereafter.

The closure machines operates in the following manner.

Figure 3 shows the mechanism in the open or start position. An aluminium foil container 36 is placed on the ejector plate 24; the container may be transported to the plate 24 by conveyor belt or any other convenient means. Aluminium foil sheet is fed from a roll (not shown) through guides 31 until the container is covered. The method of feeding the precise length of foil sheet forms no part of the present invention.

The base frame 21 is carried upward by rams 37 (Figure 4) pushing the inner die frame 22 under the edge flange of the container 36 which is lifted clear of the ejector plate 24.

The base frame 21 carries the movable knife 34 upwards by virtue of a generally "L" shaped member 38 held against the base frame (21) by a spring 39, and a ball or roller 41 engaging in a recess of the movable knife 34.

The movable knife 34 cuts the foil sheet 32 against the fixed knife 33 by means of a scissor action thus forming the foil cover for the container 36.

The foil container moves under and engages the foil cover (Figure 5). The movable knife 34 engages an abutment 42 and the ball or roller 41 disengages the movable knife recess. The ejector plate 24 is lifted with the base frame 21.

Continued upward movement of the base frame 21 (Figure 6) pulls the foil cover out of the guides 31 resulting in two opposite edges of the cover being bent downward. The ball or roller 41 is now fully disengaged from the movable knife 34.

Further upward movement of the base frame 21 (Figure 7) carries the container and cover into contact with the support plate 15. As the cover passes the lower parts of the frame members 11 the edges of the cover are bent vertically downward. The inner die frame 22 lifts the upper die assembly relative to the die frame 17 causing the frame members 11 to be urged inwardly by the guides 18. The edge of the cover is bent under the flange of the container as shown in greaterr detail in Figure 7a.

Figure 8 shows the final position of the closure mechanism. The upper die assembly rests against the upper frame 27 and continued upper movement of the base frame 21 against the effect of return springs 26 urges the crimping frame 23 against the folded edge flange of the close container. This action is best shown in Figure 8a.

Subsequent downward movement of the base frame 21 releases the closed container from the upper die assembly; contact of the guide pins 25 with the fixed base of the mechanism ensuring that the container is ejected for removal by any convenient means.

The apparatus above described has the advantage that the container cover can be cut from a roll of foil and shaped during the closing operation. Such a mechanism may be incorporated with the present invention although it is not essential.

The present invention effectively eliminates the need for a separate crimping machanism, so simplifying operation of the closure die.

Referring to Figure 9 there is shown a closure die assembly 110 having four generally "L" shaped frame members 111 biassed apart by coil springs 112. The sections 111 are held and guided in a rigid support frame 113 in a similar manner to the assembly of Figures 1 and 2.

In Figure 9 the frame sections 111a and 111b are shown in the return position with coil spring 112a expanded and the sections 111c and 111d are shown in the operative position with coil spring 112d compressed. Springs 112b and 112c between the other facing ends of the sections are not shown. Other parts of the die assembly are shown which will be described by reference to Figures 10 and 11.

Referring to Figures 10 and 11 the stages of operation of the die assembly are illustrated.

The left side of Figure 10, as viewed, shows the assembly in the open condition. A foil container 136 is placed on a lower base plate (not shown) which may be similar to that shown in Figures 3 to 8. An ejector plate may or may not be provided. A cover 145 is provided for the container; the cover may be preformed or cut from a roll of sheet material in the manner previously described.

The container is raised towards the closure die assembly and the edges of the cover bent downward by a ramp face 150 provided on the lower inner face of each of the frame members 111.

As the container contacts support plate 115, the support frame is moved upward by connecting rod 151 to move with the container baseplate. Actuation of the support frame may be by abutment with the baseplate or by separate synchronized linkage.

Top plate 114 of the support frame is rigidly connected to the connecting rod via pins 152 and head-

stock 153. Bushes 154 guide and locate the pins 152 and hence the support frame relative to the die frame 117. The container baseplate continued to move upward at the same rate as the support frame to the position shown on the right hand side of Figure 11, as viewed.

The frame members 111 are moved inwardly by the ramp faces of the guides 118 against the effect of springs 112 to bend the cover flange under the container flange. The folded edge of the container and cover enter into the jaw provided by each of the frame members 111.

Further progressive movement of the headstock 153 and container baseplate causes an abutment 155 of the support frame to contact an adjustable stop pin 156 mounted in the fixed die frame 117. The support plate 115 presses the cover flange firmly against the container flange, the load being adjustable by virtue of the screwthreaded stop pin 156. The support frame 113 has a lower portion comprising a support plate 115 for the cover and an intermediate plate 163. The plates 115 and 163 are normally biassed together by coiled compression springs 157 acting through shouldered bolts 158 secured to the support plate. The bolts 158 locate and guide the support plate relative to the support frame 113. Continued upward movement of the headstock 153 is against the effect of return springs 157 acting through the shouldered bolts 158. The support plate 115 and support frame 113 separate and the frame members 111 move upward with the support frame 113 to crimp the closed edge of container and cover. This position is shown on the right hand side of Figure 10 as viewed.

Each jaw has an upstanding inner lip 160 to crimp the folded edge of container and cover against the support plate 115, the re-entrant portion of the jaw behind the upstanding lip accommodating the folded edge of the closed container.

An upstanding lip of the support plate 162 is of generally triangular section and provides a superior crimp by virtue of the relative movement between the inner angled face and the corresponding angled face of the upstanding lip of each frame member 111. The outer angled face of the support plate lip closes a chamber formed by the re-entrant portion of each member jaw.

The chamber formed to receive the edge of the closed container accommodates the rolled edge of a container, as best seen in Figures 7a and 8a, and surplussage of foil material caused by the flange of the cover being folded under the edge of the container. It is important that the rolled edge of the container is not flattened during the crimping operation since it imparts extra rigidity to an otherwise inherently weak construction.

Lifting handles 159 are provided for the die assembly which may be secured in the fixed frame of a closure machine by any quick and convenient means.

Connecting rod 151 is simply coupled to the headstock 153 by a bayonet fitting gudgeon pin 161, best seen in Figure 9.

The headstock and container baseplate are intended to be moved in sequence by a rotary camshaft. Once the container has been closed the closure sequence will reverse to release the closed flange and allow the container to drop from the support plate (115) for removal from the machine. This operation completes one operational sequence.

In this embodiment the guides 118 are arranged in rectangular formation to act each on adjacent arms of two "L" shaped members 111. This arrangement is convenient but not essential.

The closure die assembly thus comprises a separate unit which is easily detached and removed from a closure machine for cleaning and maintenance and may be substituted by an alternative assembly suitable for different size containers.

The mechanism of the closure die assembly is disposed substantially above the container so reducing the likelihood of container contents fouling the mechanism. The area below the container, which is preferably a plain baseplate, is free of mechanism and may thus be easily cleaned and kept clear of spillages.

Actuation of the headstock and container baseplate may be alternatively by air under pressure, by electrical actuators or any other convenient means.

Although the invention has been described with the closure die moving upward with respect to the die frame, it will be apparent that the die frame could alternatively move downward to complete the closing operation.

Claims

1. A closure die assembly for securing a foil cover to a foil container and comprising a die frame (117) and a closure die (114 to 116, 163) movable axially thereof, the closure die comprising a support frame (114, 116, 163), a support plate (115) to hold a cover against a container, and closure means (111) slidable transversely of the support frame (114, 116, 163) to fold an edge flange of a cover under an edge flange of a container on relative axial movement between said closure die (114 to 116, 163) and said die frame (117), the support plate (115) being movable axially of the support frame (114, 116, 163) against a restoring bias (157), characterised thereby that said support plate (115) is normally in abutment with the support frame (114, 116, 163), said closure means (111) slide into said support frame (114, 116, 163) during relative axial movement between said closure die (114 to 116, 163) and said die frame (117), and said support plate (115) has

an abutment (155) to engage the die frame (117) such that further relative axial movement between said closure die and die frame moves said support frame (114, 116, 163) away from said support plate (115) to crimp a folded edge flange of the cover and container between said support plate (115) and closure means (111).

2. A closure die assembly according to Claim 1, characterised thereby that resilient means (157) oppose relative axial movement between said support frame (114, 116, 163) and said support plate (115).

3. A closure die assembly according to Claim 1 or Claim 2, characterised thereby that the support frame (114, 116, 163) includes location means (158) to locate the support plate (115) relative thereto.

4. A closure die assembly according to Claim 3, characterised thereby that said location means (158) guide the support plate (115) for movement axially of the support frame (114, 116, 163).

5. A closure die assembly according to Claim 4, characterised thereby that said location means comprise a plurality of upstanding guide pins (158) attached to the support plate (115) and extending through journal bearing of the support frame (114, 116, 163), the guide pins having an enlarged head and coil springs (157) being located around each of the guide pins between the support frame and a respective enlarged head to urge the support plate towards the support frame.

6. A closure die assembly according to any preceding claim, characterised thereby that an adjustable abutment (156) is provided in the die frame (117) for co-operation with said abutment (155) and to initiate relative axial movement between said support frame (114, 116, 163) and said support plate (115).

7. A closure die assembly according to any preceding claim, characterised thereby that the closure means comprise a plurality of frame members (111) each having a jaw to receive and fold an edge flange of the cover, each jaw being provided with an upstanding inner lip (160) to crimp the folded edge flange of cover and container.

8. A closure die assembly according to Claim 7, characterised thereby that the support plate (115) has a continuous upstanding peripheral lip (162) for engagement with the upstanding inner lip (160) of said frame members (111).

9. A closure die assembly according to Claim 8, characterised thereby that a chamber to receive an edge flange of cover and container is defined by the jaw and upstanding inner lip (160) of said frame members (111) and the outer edge of the upstanding peripheral lip (162) of said support plate (115).

Patentansprüche

1. Verschließwerkzeugeinheit zur Befestigung eines aus Folie bestehendem Deckels an einem aus Folie bestehenden Behälter, mit einem Werkzeugrahmen (117) und einem dazu axial beweglichen Verschließstempel (114 bis 116, 163), der einen Stützrahmen (114, 116, 163) aufweist, eine Abstützplatte (115) um einen Deckel gegen einen Behälter zu halten, und Verschließmitteln (111), die quer zum Stützrahmen (114, 116, 163) gliet bar sind, um bei einer relativen Axialbewegung zwischen dem Verschließstempel (114 bis 116, 163) und dem Werkzeugrahmen (117) einen Randflansch eines Deckels unter einen Randflansch eines Behälters zu falten, wobei die Abstützplatte (115) axial zum Stützrahmen (114, 116, 163) entgegen einer Rückvorspannung (157) bewegbar ist, dadurch gekennzeichnet, daß die Abstützplatte (115) normalerweise an dem Stützrahmen (114, 116, 163) anliegt, die Verschließmitteln (111) bei der relativen axialen Bewegung zwischen dem Verschließstempel (114 bis 116, 163) und dem Werkzeugrahmen (117) in den Stützrahmen (114, 116, 163) hieneingleiten, und die Abstützplatte (115) einen Anschlag (155) für einen derartigen Eingriff mit dem Werkzeugrahmen (117) hat, daß eine weitere relative axiale Bewegung zwischen dem Verschließstempel und dem Werkzeugrahmen den Stützrahemn (114, 116, 163) von der Abstützplatte (115) wegbewegt, um einen gefaltetten Randflansch des Deckels und Behälters zwischen der Abstützplatte (115) und den Verschließmitteln (111) einzubiegen.

2. Verschließwerkzeugeinheit nach Anspruch 1, dadurch gekennzeichnet, daß elastische Mittel (157) der relativen axialen Bewegung zwischen dem Stützrahmen (114, 116, 163) und der Abstützplatte (115) entgegenwirken.

3. Verschließwerkzeugeinheit nach Anspruch 1 oder Anspruch 2, dadurch gekennzeinchnet, daß der Stützrahmen (114, 116, 163) Lagemittel (158) zum Festlegen der Abstützplatte (115) relativ dazu enthält.

4. Verschließwerkzeugeinheit nach Anspruch 3, da-

durch gekennzeichnet, daß die Lagemittel (158) die Abstützplatte (115) in einer Bewegung axial zum Stützrahmen (114, 116, 163) führen.

5. Verschließwerkzeugeinheit nach Anspruch 4, dadurch gekennzeichnet, daß die Lagemittel eine Mehrzahl von hochstehenden Führungsstiften (158) umfassen, die an der Abstützplatte (115) befestigt sind und sich durch Zapfenlager des Stützrahmens (114, 116, 163) erstrecken, wobei die Führungsstifte einen vergrößerten Kopf haben und um jeden Führungsstift herum eine Schraubenfeder (157) zwischen dem Stützrahmen und dem jeweiligen vergrößerten Kopf angeordnet ist, um die Abstützplatte zum Stützrahmen hin zu drücken.

6. Verschließwerkzeugeinheit nach einem beliebigen vorhergehenden Anspruch, dadurch gekennzeichnet, daß ein einstellbares Widerlager (156) im Werkzeugrahmen (117) vorgesehen ist, um mit dem Anschlag (155) zusammenzuarbeiten und die relative axiale Bewegung zwischen dem Stützrahmen (114, 116, 163) und der Abstützplatte (115) einzulieten.

7. Verschließwerkzeugeinheit nach einem beliebigen vorgehenden Anspruch, dadurch gekennzeichnet, daß die Verschließmittel eine Mehrzahl von Rahmenteilen (111) umfassen, die je eine Backe haben, um einen Randflansch des Deckels aufzunehmen und zu falten, wobei jede Backe mit einer hochstehenden Innenkante (160) versehen ist, um den gefalteten Randflansch von Deckel und Behälter einzubiegen.

8. Verschließwerkzeugeinheit nach Anspruch 7, dadurch gekennzeichnet, daß die Abstützplatte (115) eine kontinuierliche abstehende periphere Kante (162) zum Eingriff mit der hochstehenden Innenkante (160) der Rahmenteile (111) hat.

9. Verschließwerkzeugeinheit nach Anspruch 8, dadurch gekennzeichnet, daß durch die Backe und die bochstehende Innenkante (160) der Rahmenteile (111) und den äußeren Rand der abstehenden peripheren Kante (162) der Abstützplatte (115) eine Kammer zu Aufnahme eines Randflansches von Deckel und Behälter definiert ist.

Revendications

1. Outillage de fermeture pour fixer un couvercle en feuille sur un récipient en feuille et comprenant un bâti d'outil (117) et un outil de fermeture (114 à 116, 163) mobile axialement par rapport à lui, l'outil de fermeture comprenant un bâti de support (114, 116, 163), une plaque de support (115) afin de maintenir un couvercle contre un récipient, et des moyens de fermeture (111) qui glissent transversalement au bâti de support (114, 116, 163) pour plier un rebord de rive d'un couvercle au-dessous d'un rebord de rive d'un récipient lors d'un mouvement axial relatif entre ledit outil de fermeture (114 à 116, 163) et ledit bâti d'outil (117), la plaque de support (115) étant mobile axialement au bâti de support (114, 116, 163) contre une force de rappel (157), caractérisé en ce que ladite plaque de support (115) est normalement en butée contre le bâti de support (114, 116, 163), lesdits moyens de fermeture (111) glissent dans ledit bâti de support (114, 116, 163) pendant le mouvement axial relatif entre ledit outil de fermeture (114 à 116, 163) et ledit bâti d'outil (117), et ladite plaque de support (115) comporte une butée (155) destinée à porter contre ledit bâti d'outil (117) afin que la poursuite du mouvement axial relatif entre ledit outil de fermeture et ledit bâti d'outil éloigne ledit bâti de support (114, 116, 163) de ladite plaque de support (115) pour sertir un rebord de rive plié du récipient et du couvercle entre la plaque de support (115) et les moyens de fermeture (111).

2. Outillage de fermeture selon la revendication 1, caractérisé en ce que des moyens élastiques (157) s'opposent à un mouvement axial relatif entre ledit bâti de support (114, 116, 163) et ladite plaque de support (115).

3. Outillage de fermeture selon la revendication 1 ou la revendication 2, caractérisé en ce que le bâti de support (114, 116, 163) comprend des moyens (158) de positionnement destinés à positionner la plaque de support (115) par rapport à lui.

4. Outillage de fermeture selon la revendication 3, caractérisé en ce que lesdits moyens de positionnement (158) guident la plaque (115) de support pour qu'elle se déplace axialement par rapport au bâti de support (114, 116, 163).

5. Outillage de fermature selon la revendication 4, caractérisé en ce que lesdits moyens de positionnement comprennent plusieurs goujons (158) de guidage orientés vers le haut, fixés à la plaque (115) de support et passant dans des coussinets du bâti de support (114, 116, 163), les goujons de guidage comportant une tête élargie et des ressorts hélicoïdaux (157) étant disposés autour de chacun des goujons de guidage, entre le bâti de support et une tête élargie respective, afin de rappeler la plaque de support vers le bâti de support.

6. Outillage de fermeture selon l'une quelconque des revendications précédentes, caractérisé en ce qu'une butée réglable (156) est prévue dans le bâti d'outil (117) pour coopérer avec ladite butée (155) et pour amorcer un mouvement axial relatif entre ledit bâti de support (114, 116, 163) et ladite plaque de support (115).

7. Outillage de fermeture selon l'une quelconque des revendications précédentes, caractérisé en ce que les moyens de fermeture comprennent plusieurs éléments de bâti (111) ayant chacun une mâchoire destinée à recevoir et plier un rebord de rive du couvercle, chaque mâchoire comportant une lèvre intérieure (160) orientée vers le haut pour sertir le rebord de rive plié du couvercle et du récipient.

8. Outillage de fermeture selon la revendication 7, caractérisé en ce que la plaque (115) de support comporte une lèvre périphérique continue (162) orientée vers le haut destinée à s'enclencher avec la lèvre intérieure (160) orientée vers le haut desdits éléments de bâti (111).

9. Outillage de fermeture selon la revendication 8, caractérisé en ce qu'une chambre destinée à recevoir un rebord de rive du couvercle et du récipient est définie par la mâchoire et la lèvre intérieure (160) orientée vers le haut desdits éléments de bâti (111) et par le bord extérieur de la lèvre périphérique (162) orientée vers le haut de ladite plaque de support (115).

FIG.1

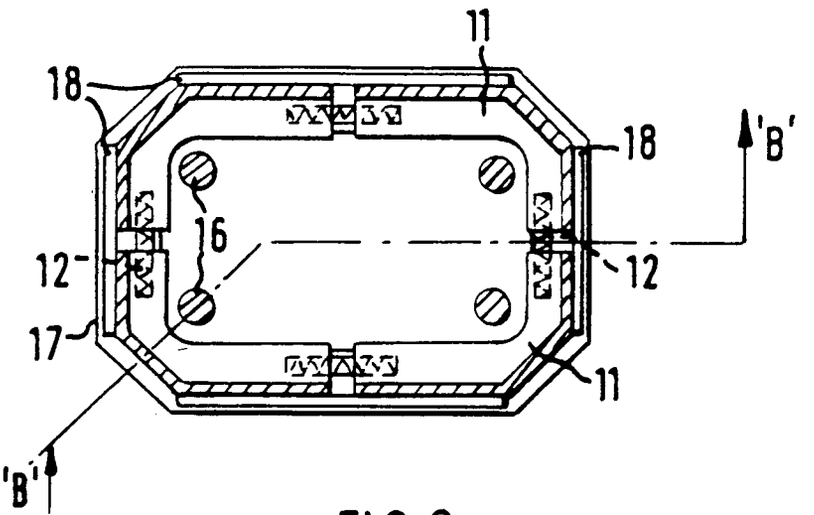
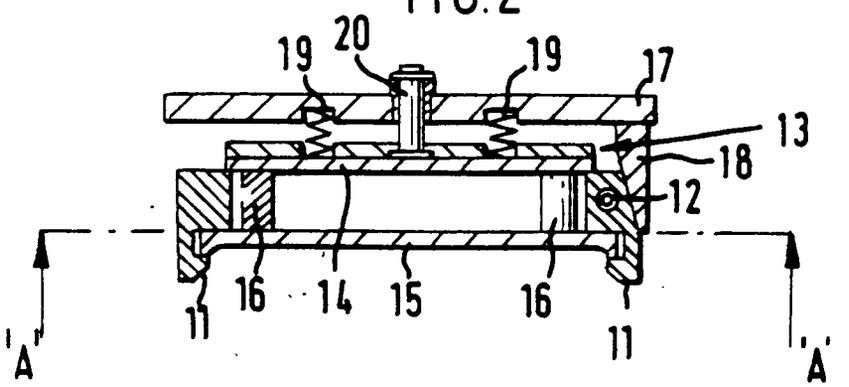


FIG.2



PRIOR ART

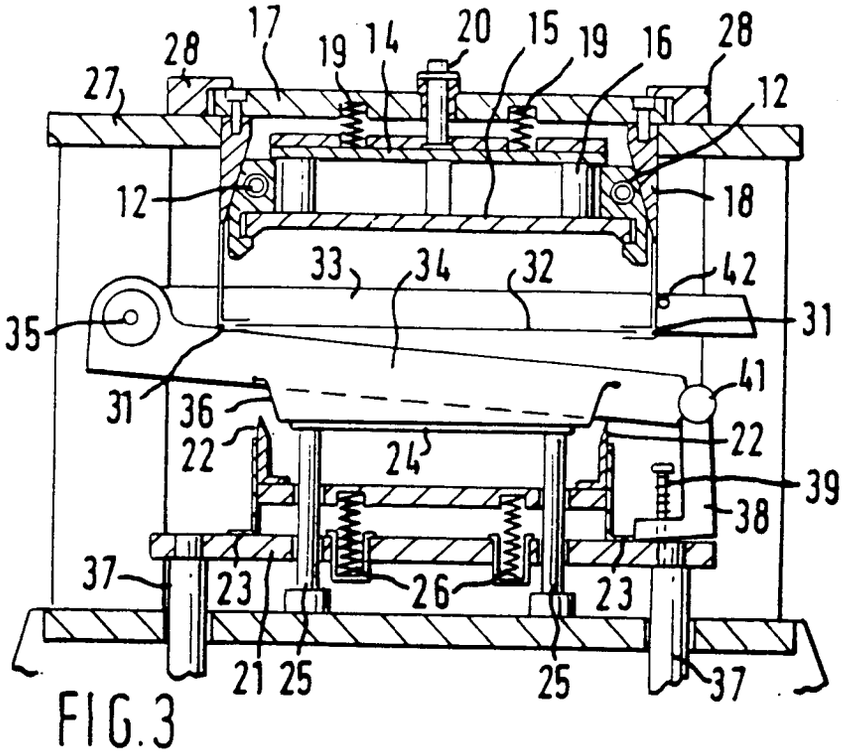


FIG.3

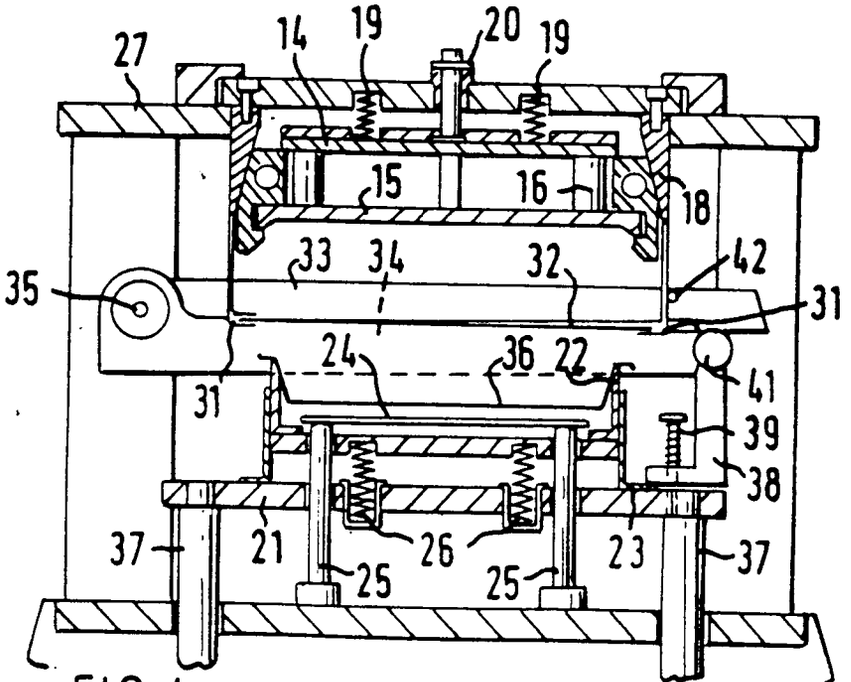


FIG.4 PRIOR ART

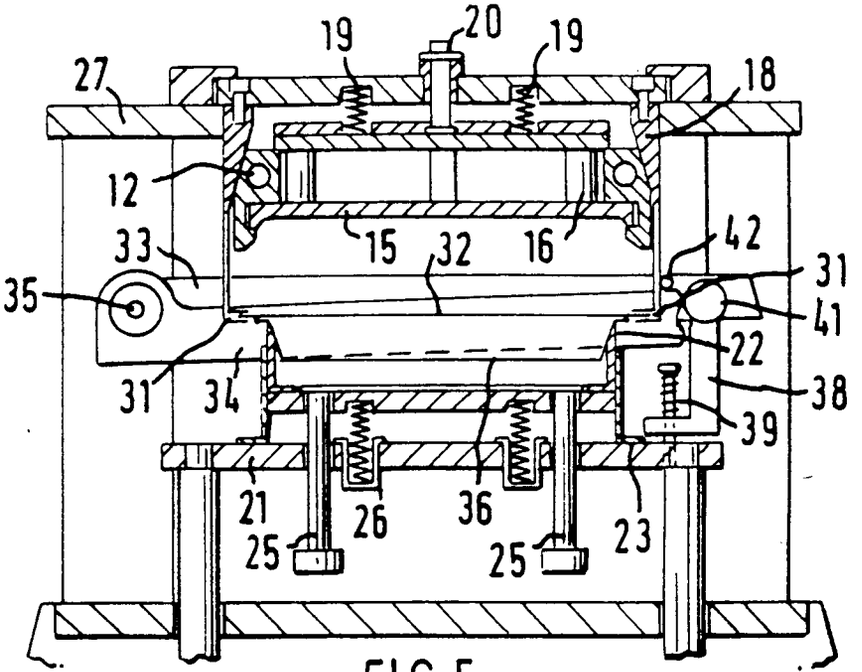


FIG.5

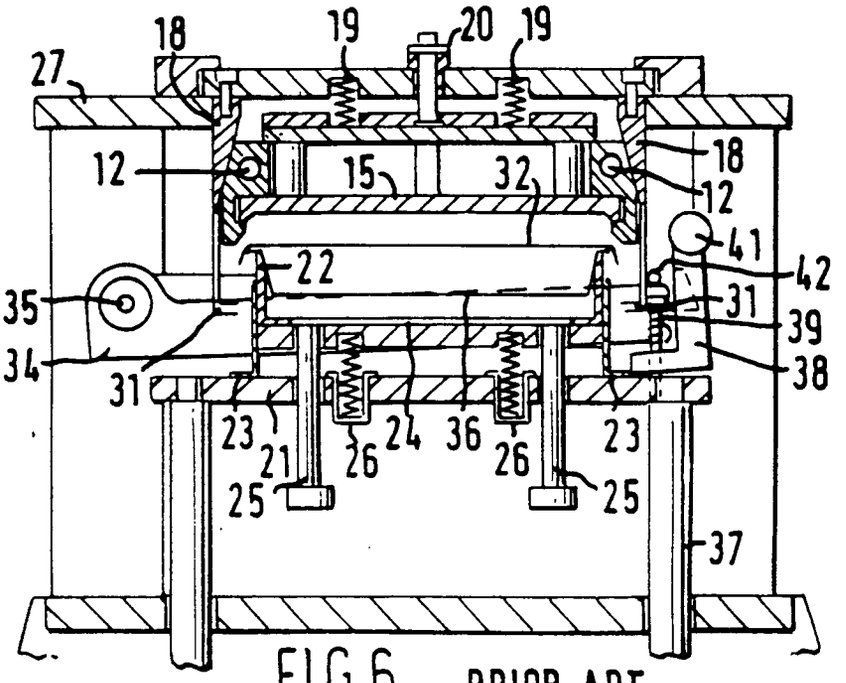


FIG.6 PRIOR ART

FIG.7

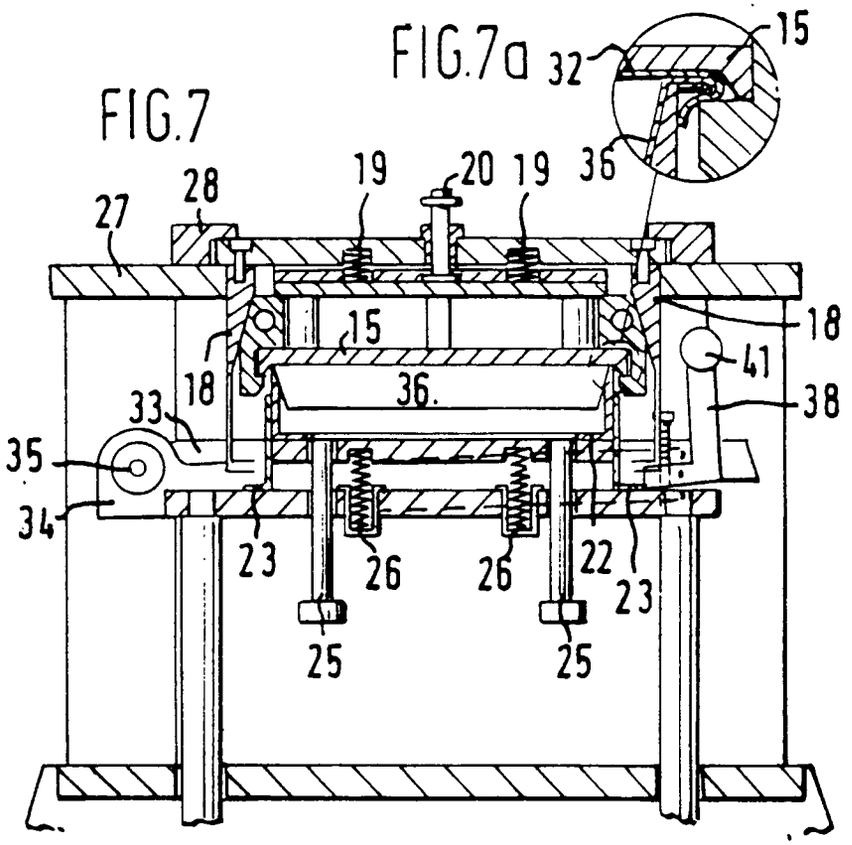


FIG.7a

FIG.8

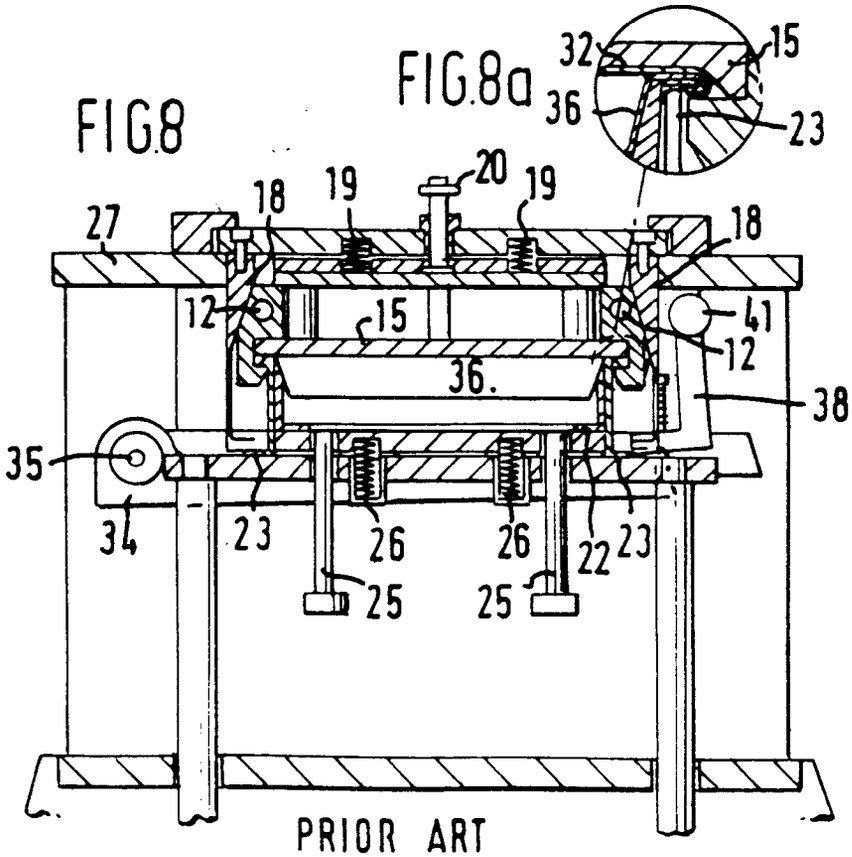


FIG.8a

PRIOR ART

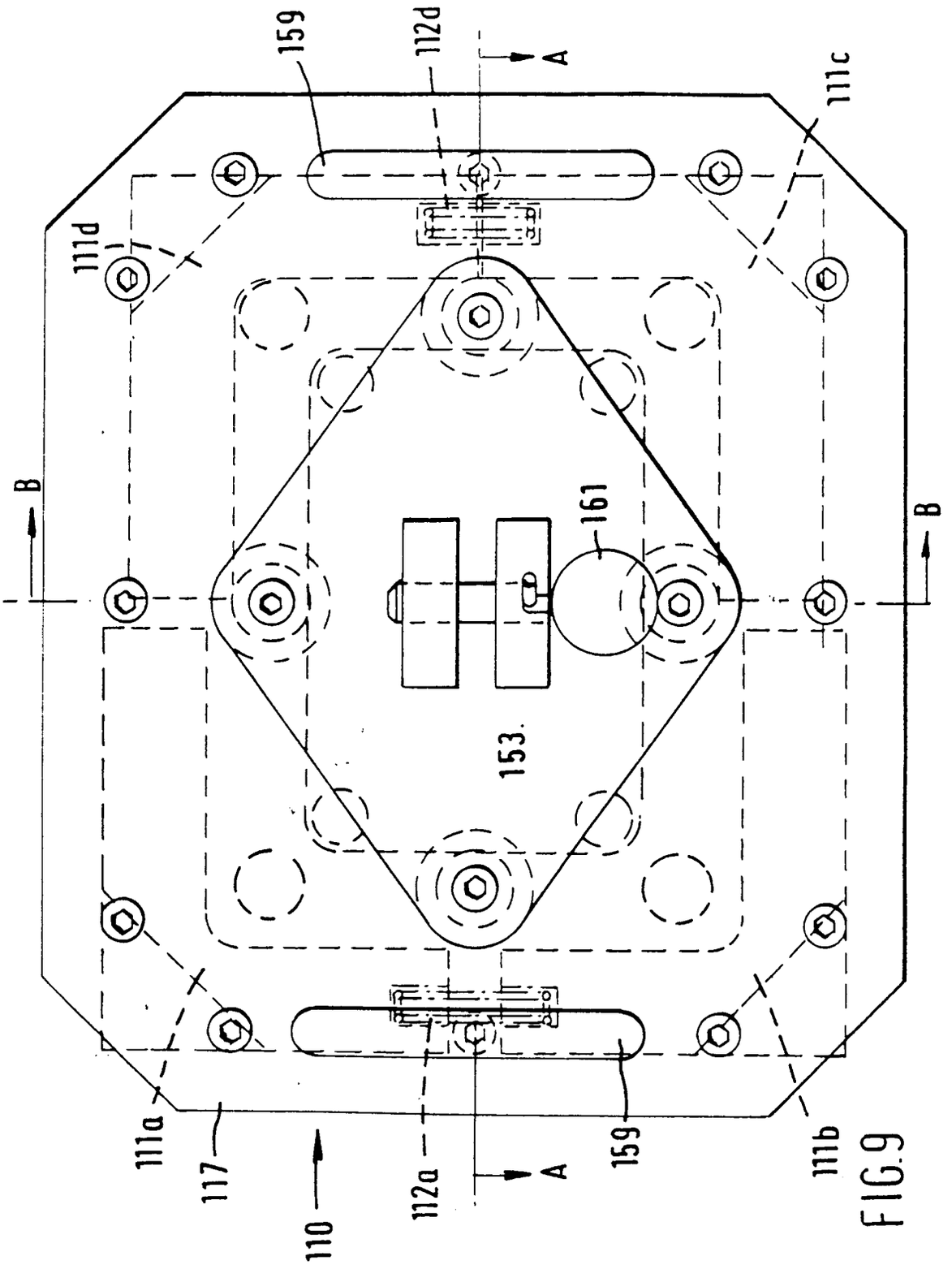


FIG.9

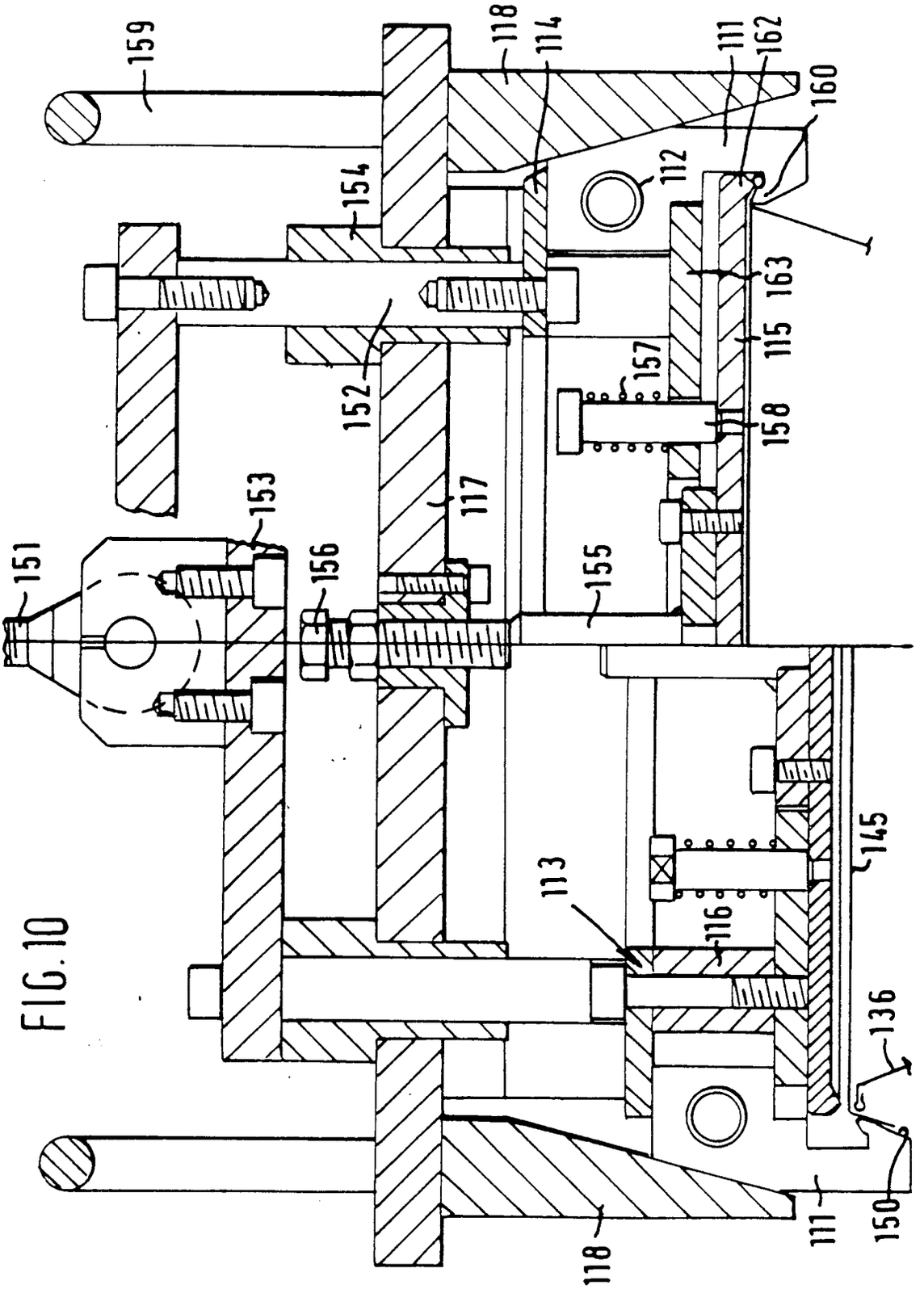

159
118
114
111
162
160
154
112
163
115
157
152
158
153
117
151
156
155
145
113
116
136
150
111
118

FIG.10

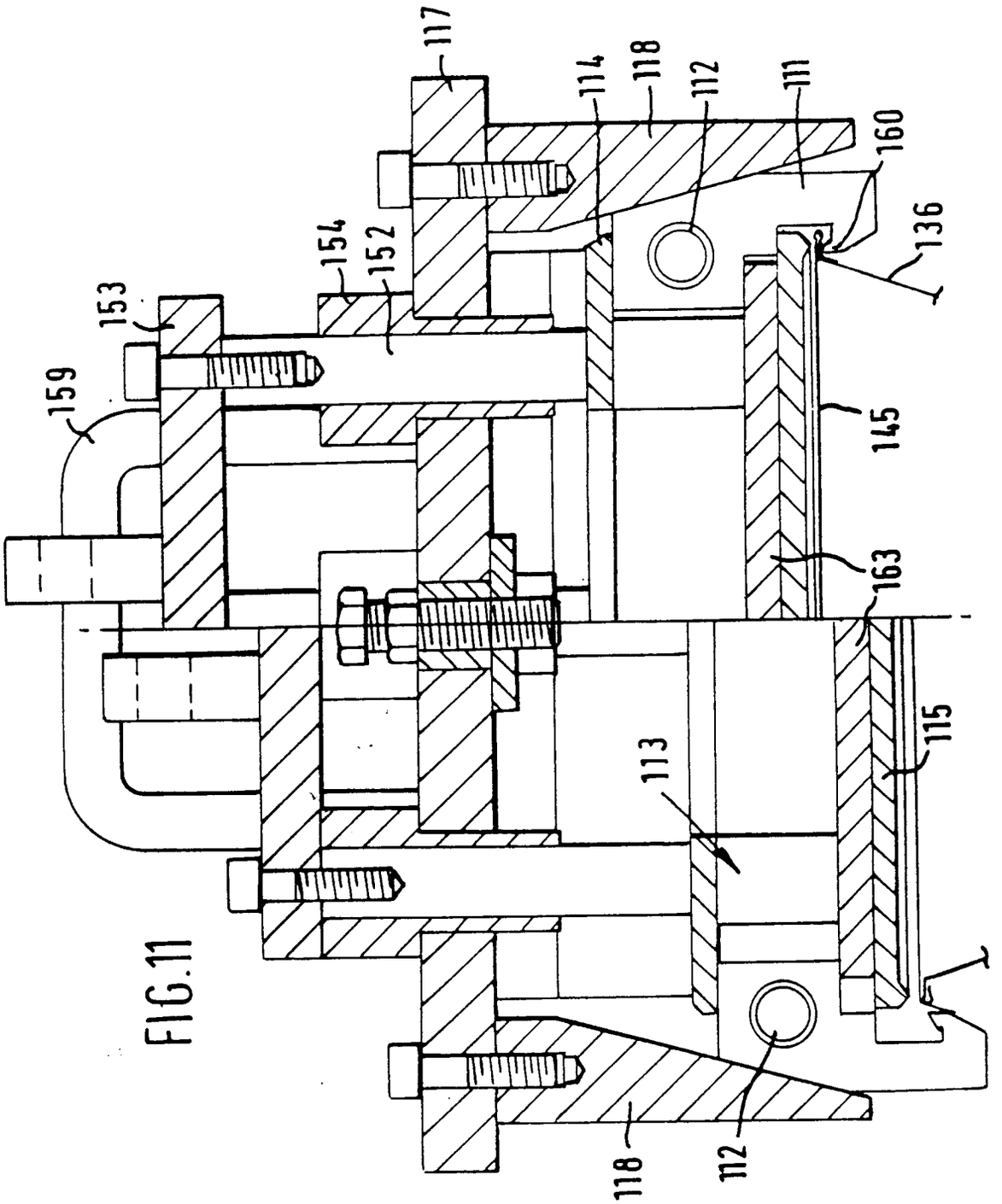

117
114
118
112
111
160
136
154
152
153
159
145
163
115
113
118
112

FIG.11