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REGULATION 9

COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1952

APPLICATION FOR A STANDARD PATENT

We, LANGEN RESEARCH B.V., Private Limited Liability Company of The Netherlands, of Beversestraat 4, 5430 AA CUIJK, The Netherlands, hereby apply for the grant of a Standard Patent for an invention entitled:-

"METHOD AND DEVICE FOR BONING MEAT PORTIONS"

which is described in the accompanying Complete Specification.

Details of basic application:-

Number: 8602388 and 8700418

Country: The Netherlands

Date: 22nd September, 1986 and 19th February, 1987

Our address for service is:

SHELSTON WATERS

APPLICATION ACCEPTED AND AMENDMENTS

55 Clarence Street

ALLOWED ..... 6 . 6 . 90 .....

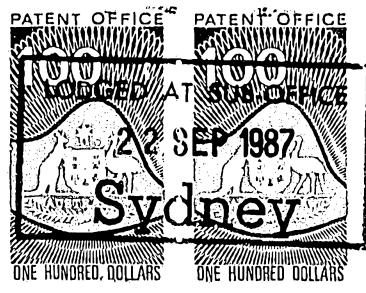
SYDNEY, N.S.W. 2000.

DATED this 22nd day of September, 1987

LANGEN RESEARCH B.V.

by *P. Heathcote*

Law Institute of Patent Attorneys of Australia  
of SHELSTON WATERS



To: The Commissioner of Patents  
WODEN A.C.T. 2606

File: 102G

Fee: \$205.00

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COMMONWEALTH OF AUSTRALIA PATENTS ACT, 1952-1973  
DECLARATION IN SUPPORT OF A CONVENTION APPLICATION FOR A PATENT

In support of the Convention Application No. .... made

(a) Here Insert (In full) Name of Company.

by <sup>(a)</sup> Langen Research B.V. ....

(hereinafter referred to as "Applicant") for a patent for an invention entitled:

(b) Here Insert Title of Invention.

<sup>(b)</sup> Method and device for boning meat portions ....

<sup>(c)</sup> Christianus Petrus Langen of 11 Zandkampen, ....

(c) and (d) Here Insert Full Name and Address of Company Official authorised to make declaration.

5431 BB CUIJK, The Netherlands ....

of <sup>(d)</sup> ....

do solemnly and sincerely declare as follows:

1. I am authorised by Applicant to make this declaration on its behalf.

2. The basic Application(s) as defined by section 141 of the Act was/were made

(e) Here Insert Basic Country or Countries followed by date or dates of Basic Application(s).

in <sup>(e)</sup> The Netherlands on the 22nd day of September 19 86

The Netherlands on the 19th day of February 19 87

(f) Here Insert Full Name(s) of Applicant(s) in Basic Country.

by <sup>(f)</sup> Langen Research B.V. ....

3. <sup>(g)</sup> Christianus Petrus Langen (1) and Johannes Christina

(g) Here Insert (In full) Name and Address of actual Inventor or Inventors.

Langen (2) ....

of (1) 11 Zandkampen 5431 BB CUIJK and (2) 56 Jan van

Cuijkstraat, 5431 GC Cuijk is/are

the actual Inventor(s) of the invention and the facts upon which Applicant is entitled to make the Application are as follows:

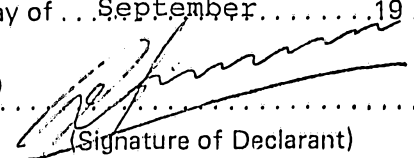
Applicant is the Assignee of the said Inventor(s).

4. The basic Application(s) referred to in paragraph 2 of this Declaration was/were the first Application(s) made in a Convention country in respect of the invention, the subject of the Application.

DECLARED at ... Cuijk, The Netherlands

this ... 10 th ... day of ... September ... 19 87

(h) Personal Signature of Declarant (c) (no seal, witness or legalisation).

LANGEN RESEARCH B.V. <sup>(h)</sup> 

(Signature of Declarant)

To THE COMMISSIONER OF PATENTS.

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**(12) PATENT ABRIDGMENT (11) Document No. AU-B-78864/87**  
**(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 600524**

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(54) Title  
BONING MEAT PORTIONS

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(71) Applicant(s)  
LANGEN RESEARCH B.V.

(72) Inventor(s)  
CHRISTIANUS PETRUS LANGEN; JOHANNES CHRISTINA LANGEN

(74) Attorney or Agent  
SHELSTON WATERS

(56) Prior Art Documents  
US 4649600  
US 4594751  
US 4577369

(57) Claim

1. A method of removing a bone from a piece of meat wherein the bone has a ridge portion which projects therefrom and wherein the piece of meat in which the bone is located is positioned between a pair of oppositely disposed pressing elements which are mounted for movement toward one another to separate the bone from the meat as they close, the pressing elements having bone retaining recesses, wherein;

the ridge portion of the bone is gripped by gripper means carried by one of said pressing elements for movement with respect to said one pressing element laterally inwardly of its bone retaining recess so as to hold the ridge fast with respect to said one pressing element as the pressing elements close.

4. A press for removing a bone from a piece of meat of the type wherein the bone has a ridge portion which projects outwardly from one side thereof, the press having

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(10) 600524

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a pair of oppositely disposed pressing elements which are mounted for movement toward and away from one another, each pressing element having a bone retaining recess, said press comprising

gripper means on one of said pressing element for releaseably gripping said ridge to secure the bone with respect to said one pressing element to prevent movement of the bone as the pressing elements close to remove meat from the bone, said gripper means comprises a pair of gripper elements which have a bite formed therebetween and wherein at least one of the elements is moveable relative to the other to open and close the bite.



METHOD AND DEVICE FOR BONING MEAT PORTIONS

The invention relates to a method and press for boning meat portions.

The invention has for its object to at least ameliorate the prior art methods and presses for separating the meat from the bones.

10 According to a first aspect of the present invention there is provided a method of removing a bone from a piece of meat wherein the bone has a ridge portion which projects therefrom and wherein the piece of meat in which the bone is located is positioned between a pair of oppositely disposed pressing elements which are mounted for movement toward one another to separate the bone from the meat as they close, the pressing elements having bone retaining recesses, wherein;

20 the ridge portion of the bone is gripped by gripper means carried by one of said pressing elements for movement with respect to said one pressing element laterally inwardly of its bone retaining recess so as to hold the ridge fast with respect to said one pressing element as the pressing elements close.

30 According to a second aspect there is provided a press for removing a bone from a piece of meat of the type wherein the bone has a ridge portion which projects outwardly from one side thereof, the press having a pair of oppositely disposed pressing elements which are mounted for movement toward and away from one another, each pressing element having a bone retaining recess, said press comprising gripper means on one of said pressing elements for releaseably gripping said ridge to secure the bone with respect to said one pressing element to prevent movement of the bone as the pressing elements close to remove meat from the bone, said gripper means comprises a pair of gripper elements which have a bite formed therebetween and wherein at least one of the elements is moveable relative to the other to open and close the bite.

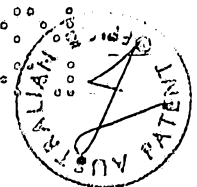
A further aspect of the invention includes a press



for removing a bone from a piece of meat, the press having pressing elements which are mounted for movement toward and away from one another along a first path, the press elements having oppositely disposed pressing faces which have bone retaining recesses formed therein and a meat severing means extending about the perimeter of the recess, said press comprising a pair of bone gripping members carried by a first of said pressing elements, said bone gripping members being mounted to extend into the  
10 bone retaining recess of said first pressing element and being moveable with respect to one another in a direction which is perpendicular to said first path to grip a bone to retain it against movement relative to said pressing elements as they are moved toward and away from one another to remove a bone from a piece of meat in use.

Yet a further feature consists in a press for removing a bone from a piece of meat wherein the bone is longitudinally elongated, the press having pressing elements which are mounted for movement toward and away  
20 from one another, the pressing elements having oppositely disposed pressing faces which have bone retaining recesses formed therein, including bone retaining means mounted for movement in at least one end of one of said recesses, and means for moving said retaining means into engagement with a bone when a bone is located therein in use for securing a bone against longitudinal extension within said cavity in response to the compressive loads which are applied to the bone during meat removing compression in the press.

A further aspect provides a press for removing a  
30 plurality of longitudinally elongated bones from a piece of meat, the press having pressing elements which are mounted for movement toward and away from one another, the pressing elements having oppositely disposed pressing faces which have bone retaining recesses formed therein, including bone retaining means slidably mounted in at least one of said recesses of a first of said pressing element for movement with respect to said first pressing



element, and drive means for driving the bone retaining means to and fro between first and second positions to secure each bone against longitudinal movement so as to lock the bone within the bone retaining recesses.

The invention will be further described, by way of example only, with reference to the accompanying drawings in which;

Fig. 1 shows a perspective view of a device for boning meat portions embodying the invention,

10 Fig. 2 shows a sectional view of the pressing elements of fig. 1,

Fig. 3 is a partially sectioned perspective view of the bone gripper elements of fig 2.

Fig. 4 and 5 a cross-sectional view according to IV-IV in fig. 2, wherein the pressing elements are separated from each other or pressed to each other respectively.

Fig. 6 a cross-sectional view according to VI-VI in fig. 2.

20 Fig. 7 shows on a larger scale a perspective view of a part of the lower pressing element provided with gripper members according to a second embodiment of the invention.

Fig. 8 shows a sectional view like fig. 2 of the lower and upper pressing element according to the embodiment in fig. 10.

Fig. 9 is a cross-sectional view of gripping members according to a third embodiment of the invention.

Fig. 10 shows a top view of a fourth embodiment of the invention,

30 Fig. 11 shows on a larger scale a cross-sectional view along line XI-XI from fig. 7.



Fig. 12 a sectional view like fig. 2 of the lower and upper pressing elements, the cavity of which is provided with locking-up and/or pressing means.

Fig. 13 is a bottom view of the upper pressing element 5 in fig. 12,

Fig. 14 and 15 a sectional view like fig. 12, detailing the upper pressing element as further embodiment and a bottom view of the upper pressing element in fig. 4 respectively,

10 Fig. 16 a sectional view of the upper pressing element like fig. 4, provided with a loose insert as further embodiment of the locking-up means.

Fig. 17 a sectional view of a detail of the lower pressing element, provided with a further embodiment of the pressing means for pre-loading each bone-piece.

The boning device in fig. 1 comprises a frame 1 of such a rigid structure to withstand high pressing forces between the lower and upper pressing element 2 and 3 respectively. The pressing elements 2 and 3 are arranged opposite to each-  
20 other whereas the upper element 3 is rigidly suspended to the top side of the frame 1, whereas the lower element 2 is supported by a hydraulic cylinder 4 arranged in the lower part of frame 1. Due to the cylinder 4, the piston of which is movable in up- and downward direction, the lower pressing element 2 can be moved upwardly starting from the position as  
25 shown in fig. 1.

Each element 3 is provided with a recess 5, which will be elucidated herebelow. The recess is adapted to receive the bone part in a meat portion M, which is to be deboned.

30 It is assumed that the operator will put the meat portion M on top of the lower pressing element 2, whereupon after actuation of the hydraulic cylinder 4 the pressing element 2 is urged to pressing element 3, so punching out the bone part from the meat portion M. After having lowered the  
35 pressing element 2, the bone parts are left in the recess 5, whereas the meat portion can be removed from between the pressing elements.

In order to have the bone part correctly placed near the recess 5, a plurality of members 6 are arranged in straddled



relationship to the upper pressing element 3, said members urging the bone parts to the right position in between the lower and upper pressing elements 2 and 3. The working of said elements and the above mentioned device is disclosed in applicants earlier application as mentioned hereinbefore. It is noticed that in such a device the meat itself is not brought under pressure except for the bone part.

10 Turning now to the figures 2-6, it is noticed that the recess 5 in the lower and upper pressing element 2, 3 is provided with bone retaining means in the form of inserts 7 and 8 respectively, of any suitable material. The pressing surface 9 of the inserts are cooperating such that the remaining space between the inserts when the lower and upper pressing element are pressed to each other will just receive the bone volume, such that all the meat material attached to the bone parts are urged outwardly.

20 In order to avoid damage to the bone parts, that is to say, splintering or fracture of the bones, the inserts 7 in the lower pressing element 2 may yield downwardly into the lower recess 5 of said element, which is possible by reason of the particular support in the form of a piston 10. The lower end of the piston 10 is protruding in a pressing chamber 11, which can be filled with a hydraulic pressure fluid. The pressure is such that a sufficient pressure can be exerted upon the bone but not so high that the bone will damage.

30 It is noticed that the inserts can be made of any suitable material such as flexible material, like rubber, but also metal, like copper etc.

The insert 7''', right in fig. 2, is not supported by a piston 10 as under the other inserts 7, but is supported without any yielding possibility in element 2.

Said insert 7'''' is nevertheless provided with a pair of gripping members 12, 13 showing a head portion and a shank portion 14. The shank portion is strip-like and fits into a guiding orifice of a rectangular cross-section



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formed in the insert 7'''. The head portions of the gripper elements 12, 13 have a particular shape adapted to cooperate with one side of a bone portion, for instance a shoulder blade. Such a blade B is provided with a ridge 17 and adjacent cavities 15, 16, see also fig. 4, 5.-----

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Furthermore the shank portions 14 of both the gripping elements 12, 13 are oblique to each other, so when lowering the shank portions in the inserts 7''', the head portions will converge each other; and when moving upwards the head 5 portions will diverge.

In the embodiment shown in fig. 2-5, the gripping elements 12, 13 are supported by a piston 10' corresponding with the pistons 10 underneath the other inserts 7.

As is clearly depicted in the figs. 4 and 5 the meat 10 surrounding the shoulder blade B will be urged out of the cavities 15, 16 due to the profiled top surface of the head portions of gripping elements 12, 13, see fig. 5. As soon as the meat is separated from the bone the pressing elements 2, 3 can be separated from each other to the position in fig. 4, 15 whereupon the piston 10' will urge the elements 12, 13 upwardly, so freeing the bone from the lower element. A next meat portion can be entered in between the lower and upper pressing element 2, 3 again, as is shown in fig. 4.

Turning to the fig. 7-11 several alternatives of the 20 gripping elements 12, 13 are elucidated. In the embodiment according to fig. 7, 8 the upper press element 35 is suspended to hydraulic cylinders 36, whereas the lower pressing element is fixedly secured to a frame. Moreover the inserts are here embodied in rubber material 37.

25 The embodiment of the device 23 as in fig. 7, 8 comprises a press frame 24 which has a lower press element 25. In press element 25 a clamp 26 is forced upward in vertical direction by a compression spring 10'' instead of the hydraulic cylinder. Clamp 26 consists of a non-pivoting gripper member 30 27 guided only in vertical direction in the press element 25 and a gripper member 28 which can pivot relative to gripper member 27 by means of a hinge 61. Gripper member 28 has a projection 29 which cooperates with a stop member 30 of press element 25. During upward movement of clamp 26 gripper member 35 28 pivots in arrow direction 31 as a result of projection 29 striking against stop member 30, this causing the clamp 26 to open. The position in fig. 7, 8 is then reached. A piece of meat M can now be laid on press element 25, whereby the piece



of meat M, in which a slight incision may or may not have been made beforehand, is placed with its ridge 17 into the opened clamp 26. The rest of the piece of meat M with the bone B shown therein is now placed into the recess 33 of the  
5 press element 25 adapted for the B. An upper press element 35 is then driven downward forcefully by means of hydraulic cylinder 36. Through deforming of the rubber 37 the bone B can be enclosed on all sides, so that virtually all the meat 39 with the exception of sinew is forced out of the press and is  
10 there cut off by means of a separating edge 20. It is noted that when the press is closed the clamp 26 is forced downward, as a result of which the gripper members 27 and 28 are forced towards each other, thereby clamping the ridge 9 tightly between them. Both gripper members 27 and 28 thereby pene-  
15 trate into the cavities 15 and 16 on either side of ridge 9, so that the meat present there is pressed out. There is then created, as it were, a continuous upper surface of the press element 25 that is well adapted to the underside of bone B.

With the device 41 in fig. 9 a lower press element is  
20 formed by a frame 42 having two gripper members 44 therein which can pivot in shafts 43, which members form, in lifted position by means of counterweights 45, an opened clamp in which can be placed a piece of meat M. During downward movement the gripper members 44 pivot downward and then penetrate  
25 into the cavities 15 and 16 of bone B. The upper parts and edges of the gripper members 44 are adapted to the underside of bone B. The downward forcing can be carried out by means of an upper press element (not shown).

The device 51 from fig. 10 and 11 is adapted for boning  
30 a piece of meat M with an end bone 54 that has a ridge 53. With this device 51 the piece of meat 52 is positioned on a press element 55 by means of a clamp 56 with a vertically guided, non-pivoting gripper member 57 and gripper member 57 connected thereto for pivoting.

35 In addition, a simpler clamp 59 may be employed for good positioning of the end bone 54 and thereby the entire piece of meat M. A press element (not shown) placed above this and adapted to the upper surface of the bone can be moved downward in order to press out all the meat.



Turning now to figure 12 and 13, the embodiment here is also provided with particular inserts in the recess 60 of the lower pressing element 61 and upper element 62 respectively. Lower element 61 is moveable in up- and downward direction according to arrow P1, what can be embodied by the cylinder 4 in figure 1.

10 The inserts as shown are partly of solid material, like metal 63, an insert 64 with gripping members 65 corresponding to the embodiment in figure 8, and yieldable material like rubber 66. The insert 63 in the lower pressing element 61 is supported by the pistons 10.

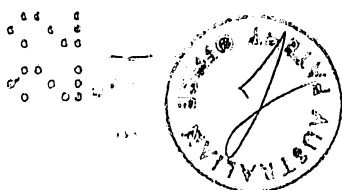
As is clearly depicted in figure 13 the group of bones B are hingedly connected to each other, whereas the left portion in figure 13 is the so-called shoulder blade S.

According to the invention the recess in both the pressing elements are provided with stop faces 74, which are formed here by the head end of a stub 75, protruding into the recess 60.

20 Said stop face may also be a fixed part of the inner wall of the recess of the pressing element, see for instance at 74'. However the stop faces are located such there where the head ends K of a bone B is laying in the recess, whereby the bone is locked-up in length-wise direction.

The middle-bone in figure 13 is solely supported at one side by a face 74, since due to its configuration the bone is supported in the hinge of the bone at the right side, so it will be locked-up sufficiently.

30 Furthermore it will be noted that in the embodiment as shown in figure 12 and 13 the upper pressing element is provided with such stop surfaces 74, 74', since the inserts 63 have such dimensions that in the closed position of the upper and lower pressing elements the bone will be received substantially in the upper pressing element.



The advantage obtained by the stop faces 74, is that yielding inserts 63 can be avoided easily, whereupon those inserts may be made in harder material, for instance stainless steel. Having an adapted contouring surface of the inserts, the bone will be enveloped rather accurate, and even-----



when using high pressing forces the bone will be a bit deformed, but will not be damaged or fractured. Within the scope of the invention it is possible to provide the stub 75 with an actuating system 76, so being able to bring the stub 75  
5 more or less far protruding in the recess and also the related stop face 74. It is also possible to urge a certain pressure upon the bone in length-wise direction by means of the system 76, so compensating even in high pressing forces of the pressing element 61, 62 a possible length variation of  
10 the bone.

The actuating system 76 can be hydraulic, pneumatic or mechanic and it can fully be removed when the stub 75 has the form of a screw-bolt. When rotating the bolt is a threaded hole in the wall of the upper element, the face 74 can be  
15 brought more or less into the recess thereof.

The reciprocating movement of the stub 75 can be effected before the meat portion M with including bones are laid upon the lower pressing element, but it can also be effected when the pressing elements are urged almost to each other,  
20 when a certain pressing force upon the bone piece is already available. In that case the hydraulic cylinder 76 can be actuated in order to bring the stub 75 and of course the stop face 74 against the head end of a bone in order to obtain the desired compensation force for diminishing the increase of  
25 length of the bone piece.

In the next embodiment according to figures 14 and 15 the stub 75 may have another position with respect to the element 62. Figure 14 shows an orifice in the upper pressing element 62 to receiving a stub 75', which is more or less  
30 protruding into the recess of the pressing element by means of a corresponding actuating system 76'. The cylindrical surface of the stub 75', here indicated with 74, serves as pressing surface which will contact the head end K of a bone B. The surface is inclined with respect to the direction of mo-  
35 vement of the stub 75' in order to preload the bone piece more when the stub 75' is protruding more into the recess of the pressing element.

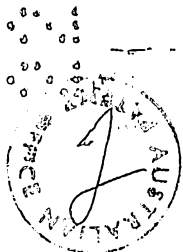


Figure 16 shows a exchangeable insert 77, the surface 74'' of which facing the recess of the upper element 62 is also inclined, so when moving the pressing element against eachother, the bone portion in the recess of the upper element 62 is preloaded in length-wise direction since the surface 14'' compresses the head end of the bone B. Owing to the inclination of the surface 74'' it will happen that when urging the bone piece more in the upper element 62, the preloading upon the head end of the bone B will raise, what will diminish the increase of the length of the bone, so avoiding damage.

The insert 77 is dependent upon the average bone form and is to be exchanged by other inserts, in order to obtain the optimum preloading upon the head end of the bone. This is dependent upon the experience and the skill of the operator.

A fourth embodiment of a lock-up member for the head end of a bone piece is depicted in figure 17, wherein a ridge 78 is arranged in the insert 71, its knife-like edge protrudes from said insert. The location of the ridge 13 is near the outer extremity of the insert 71 and so near the head end of a bone B. This knife-like ridge will carve into the bone when closing the pressing elements and in this manner a displacement of the head end is prevented and therefor the increase of the bone length.

Also in this way there will be generated a force acting upon the bone, so preventing fracture of said bone.

The invention is not limited to the embodiment as described hereabove and as shown in the drawings.

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THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:-

1. A method of removing a bone from a piece of meat wherein the bone has a ridge portion which projects therefrom and wherein the piece of meat in which the bone is located is positioned between a pair of oppositely disposed pressing elements which are mounted for movement toward one another to separate the bone from the meat as they close, the pressing elements having bone retaining recesses, wherein;

the ridge portion of the bone is gripped by gripper means carried by one of said pressing elements for movement with respect to said one pressing element laterally inwardly of its bone retaining recess so as to hold the ridge fast with respect to said one pressing element as the pressing elements close.

2. A method as claimed in claim 1, wherein the bone is formed with at least one cavity extending along one side of the ridge thereof into which meat extends, wherein said gripping means is operable to expel the meat from said cavity as the gripper means moves laterally into engagement within said ridge.

3. A method as claimed in claim 1, wherein the bone from which the meat is to be removed has a main body portion which has first and second oppositely disposed side faces, said ridge projecting from one of said side faces and wherein the gripper means grips the ridge and is located at said first side of said main body and the other of said pressing elements is arranged to bear against said second side face of the bone.

4. A press for removing a bone from a piece of meat of the type wherein the bone has a ridge portion which projects outwardly from one side thereof, the press having a pair of oppositely disposed pressing elements which are mounted for movement toward and away from one another, each pressing element having a bone retaining recess, said press comprising

gripper means on one of said pressing element for releaseably gripping said ridge to secure the bone with



respect to said one pressing element to prevent movement of the bone as the pressing elements close to remove meat from the bone, said gripper means comprises a pair of gripper elements which have a bite formed therebetween and wherein at least one of the elements is moveable relative to the other to open and close the bite.

5. A press as claimed in claim 4, for use in association with a meat bearing bone of the type which is formed with at least one cavity extending along one side of the ridge portion thereof into which meat extends, the further improvement wherein the gripper means is adapted to conform to the configuration of said cavity and is operable to expel the meat from the cavity as the gripper elements move to the closed position in use.

6. A press as claimed in claim 4, wherein the gripper elements are moveable relative to the one pressing element which is disposed toward the ridge portion of the bone in use.

7. A press as claimed in claim 4, wherein the gripper elements are pivotally mounted for movement with respect to one another.

8. A press as claimed in claim 4, further comprising drive means associated with said pressing elements for driving the gripper elements to and fro between said open and closed positions.

9. A press as claimed in claim 4, further comprising means normally urging said gripper elements to said open position and stop means for limiting the movement of the or each moveable element to limit the extent to which the element may open.

10. A press as claimed in claim 4, wherein each of the pressing elements has a meat severing ridge defining the perimeter of the bone retaining recess, said gripping means being located within the perimeter of said bone retaining recess.

11. A press for removing a bone from a piece of meat, the press having pressing elements which are mounted for



movement toward and away from one another along a first path, the press elements having oppositely disposed pressing faces which have bone retaining recesses formed therein and a meat severing means extending about the perimeter of the recess, said press comprising a pair of bone gripping members carried by a first of said pressing elements, said bone gripping members being mounted to extend into the bone retaining recess of said first pressing element and being moveable with respect to one another in a direction which is perpendicular to said first path to grip a bone to retain it against movement relative to said pressing elements as they are moved toward and away from one another to remove a bone from a piece of meat in use.

12. A press for removing a bone from a piece of meat wherein the bone is longitudinally elongated, the press having pressing elements which are mounted for movement toward and away from one another, the pressing elements having oppositely disposed pressing faces which have bone retaining recesses formed therein, including bone retaining means mounted for movement in at least one end of one of said recesses, and means for moving said retaining means into engagement with a bone when a bone is located therein in use for securing a bone against longitudinal extension within said recess in response to the compressive loads which are applied to the bone during meat removing compression in the press.

13. A press for removing a plurality of longitudinally elongated bones from a piece of meat, the press having pressing elements which are mounted for movement toward and away from one another, the pressing elements having oppositely disposed pressing faces which have bone retaining recesses formed therein, including bone retaining means slidably mounted in at least the recess of a first of said pressing elements for movement with respect to said first pressing element, and drive means for driving the bone retaining means to and fro



between first and second positions to secure each bone against longitudinal movement so as to lock the bone within the bone retaining recesses.

14. A press as claimed in claim 13, wherein a plurality of bone retaining means are mounted in said recess.

15. A press as claimed in claim 14, wherein the bone retaining means comprises stop means and associated pressing means in said recess arranged to bear against opposite ends of the bones which are to be retained therein.

16. A press as claimed in claim 15, wherein said stop means is moveable with respect to its associated pressing means so as to be adjustable to apply a preload longitudinal compression to one end of a bone before the pressing elements close.

17. A press as claimed in claim 15, wherein said stop means has an end face directed toward an end of a bone in use, said stop face being angularly inclined with respect to the direction in which the pressing elements close so as to apply a progressively increasing compressive load to the bone as the pressing elements move toward their closed position.

18. A press as claimed in claim 15, wherein the stop means comprises a ridge which protrudes from one of the pressing elements, said ridge having a knife-like edge arranged to bear against a bone to secure the bone against longitudinal movement with respect to the pressing elements in use.

19. A press for boning meat substantially as herein described with reference to figures 1 to 6, figures 7, 8 and 11 or figure 9 of the accompanying drawings.

DATED this 25th day of May 1990.

LANGEN RESEARCH B.V.

Attorney: WILLIAM S. LLOYD  
Fellow Institute of Patent Attorneys of Australia  
of SHELSTON WATERS





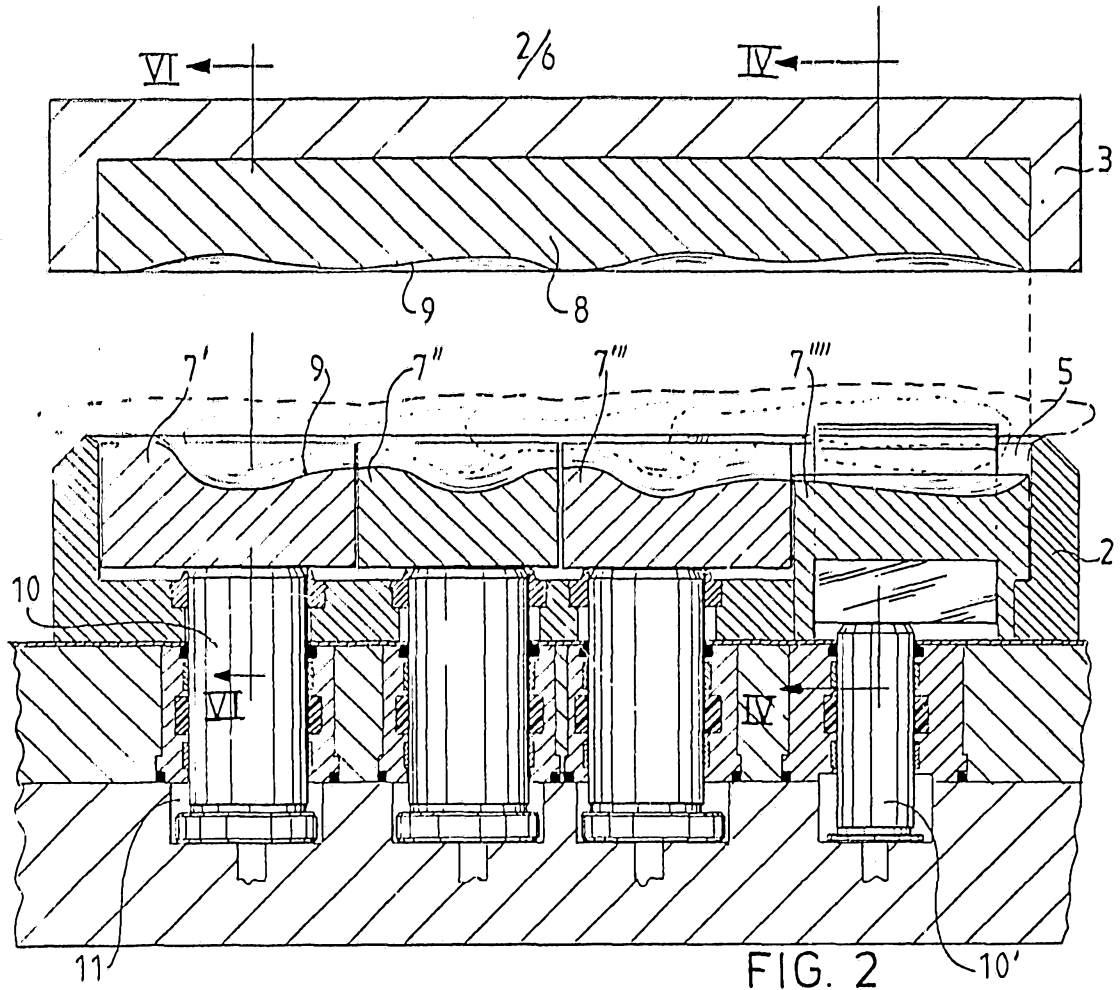


FIG. 2

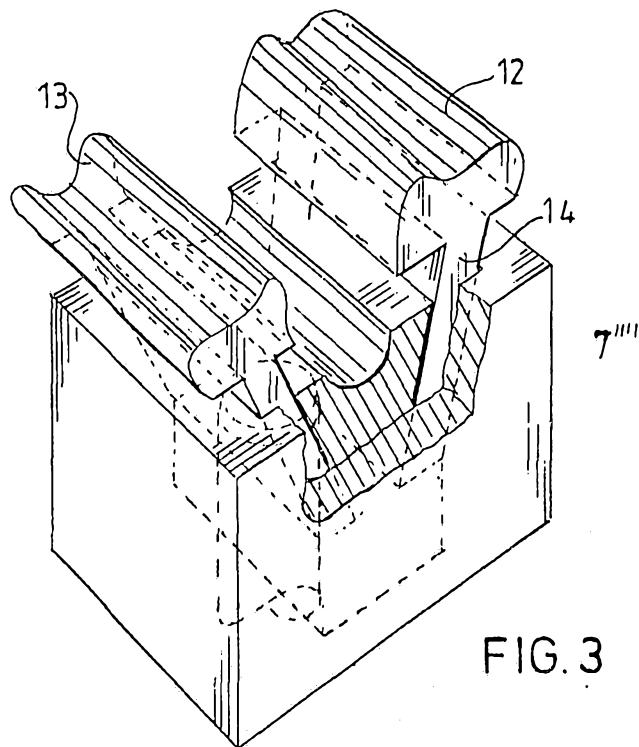
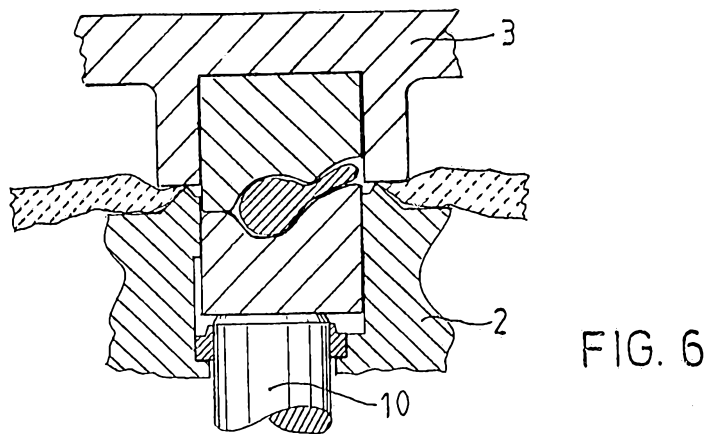
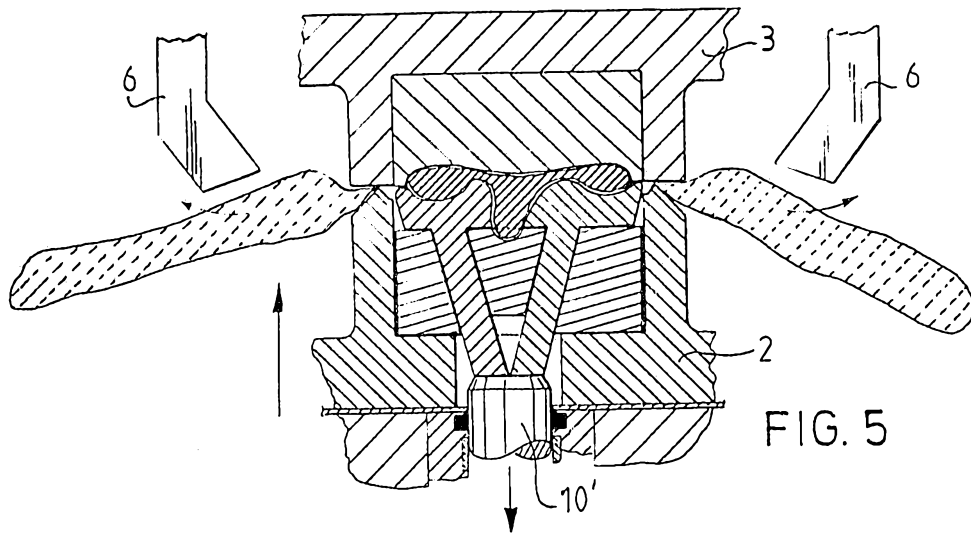
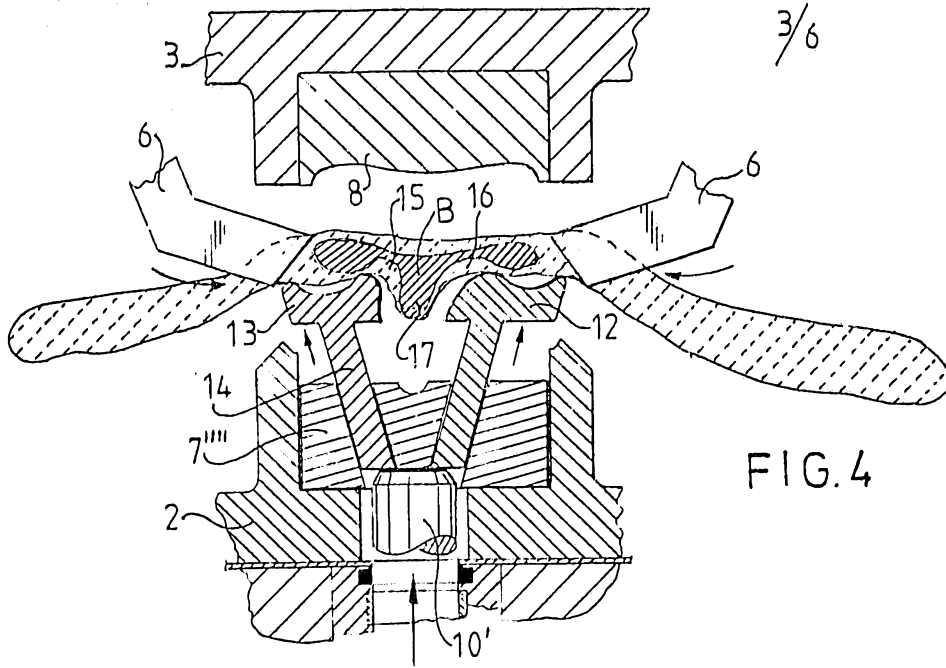
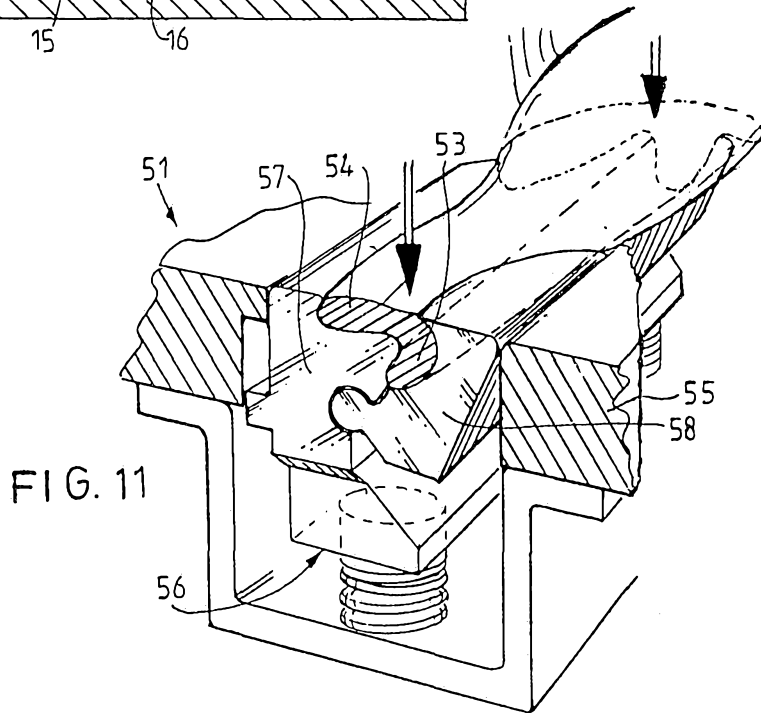
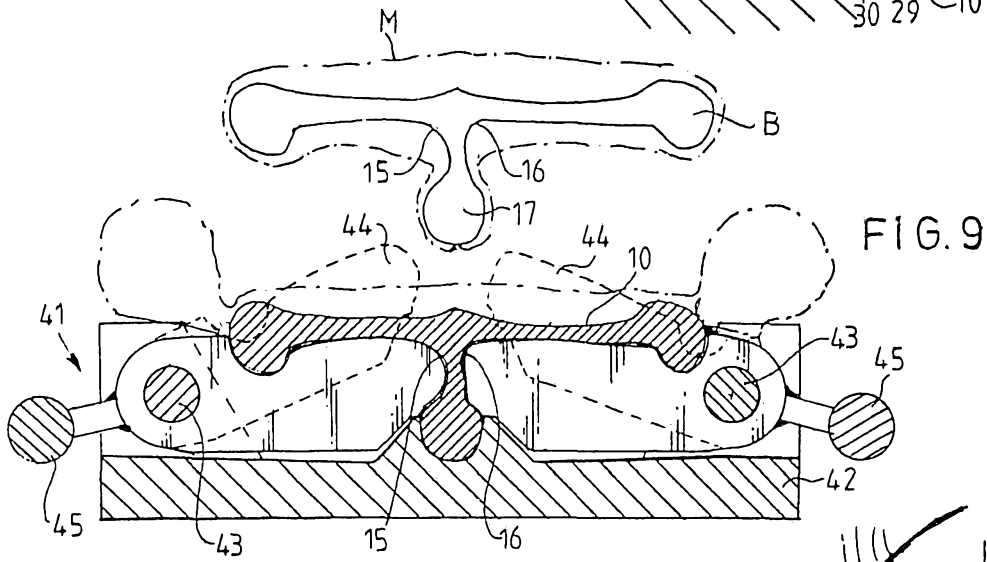
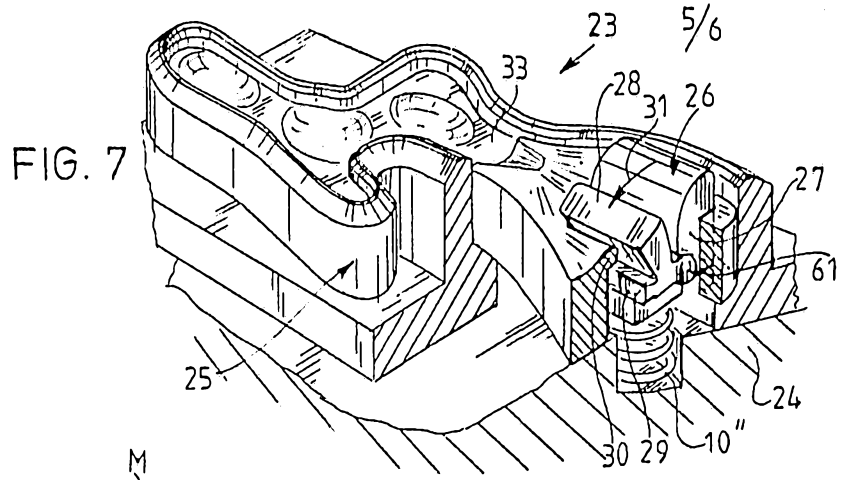
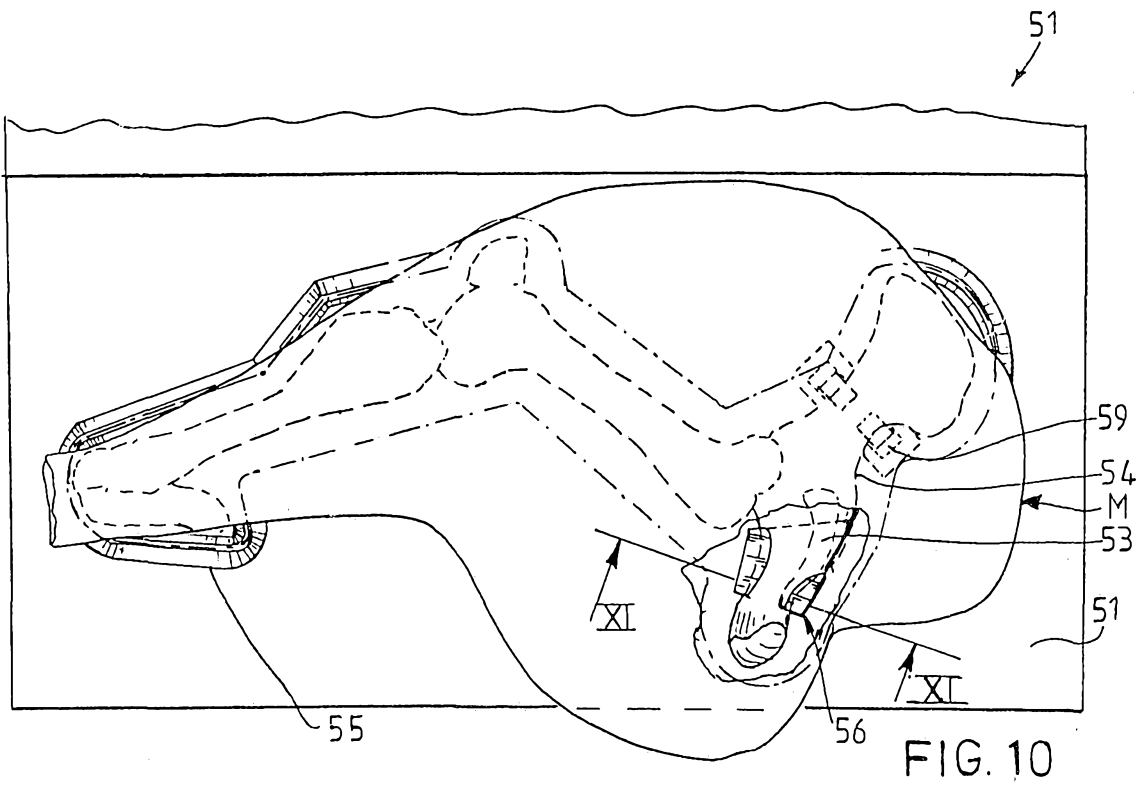
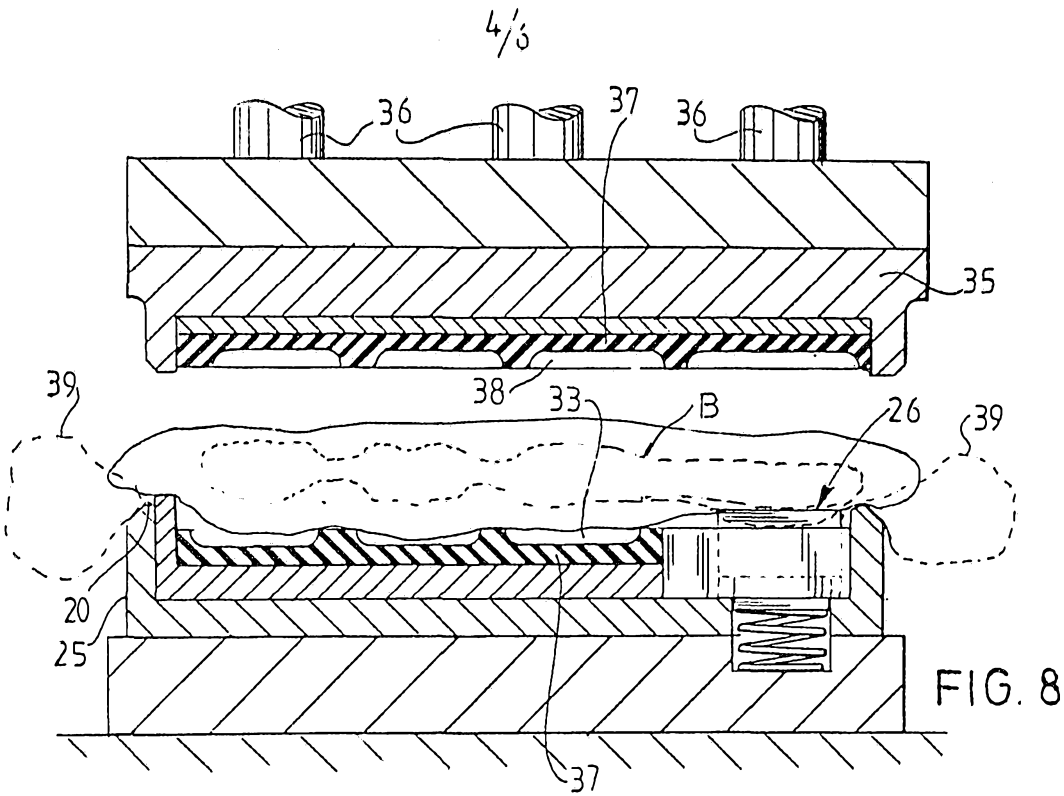


FIG. 3







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FIG.13

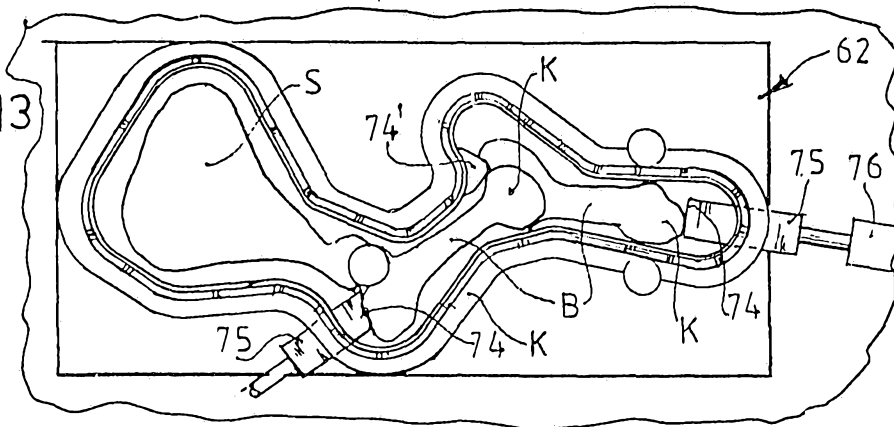


FIG.12

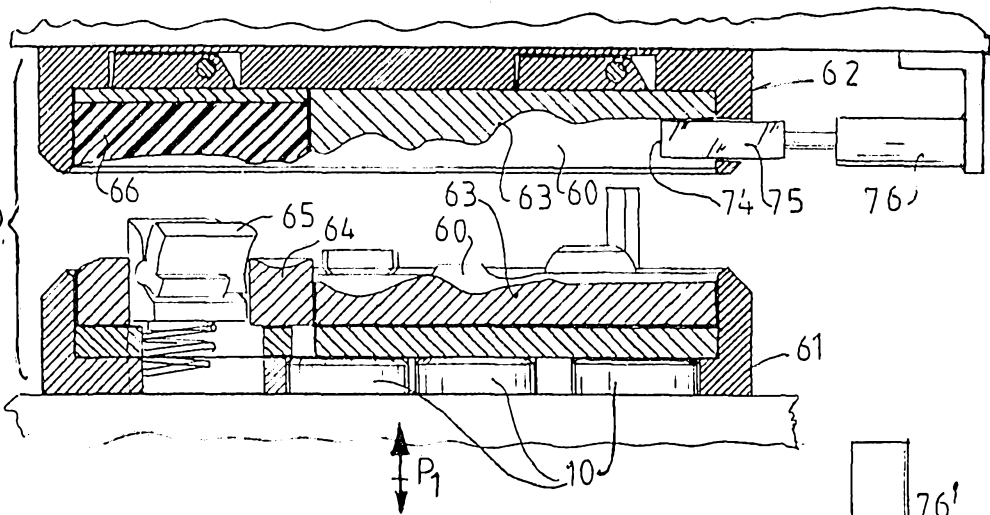


FIG.16

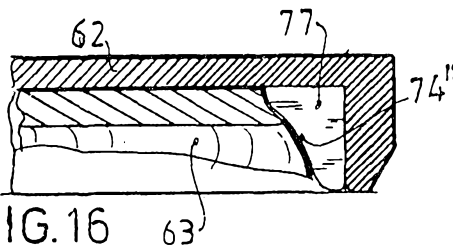


FIG.14

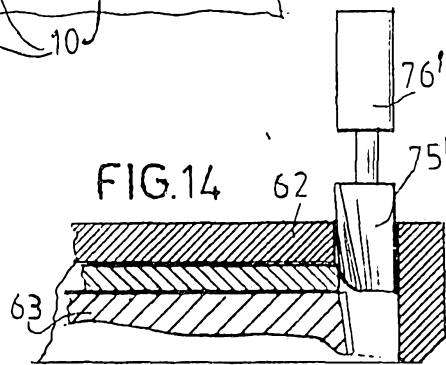


FIG.17

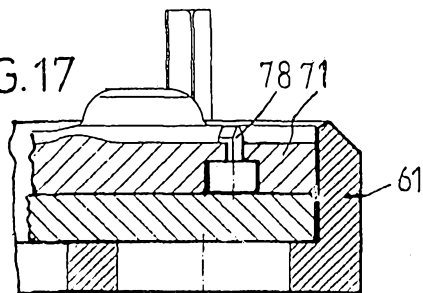


FIG.15

