

New Zealand No. 272969

International No. PCT/

TO BE ENTERED AFTER
ACCEPTANCE AND PUBLICATION

Priority dates: 12.09.1994;

Complete Specification Filed: 08.09.1995

Classification:(6) A01K14/00

Publication date: 25 November 1998

Journal No.: 1434

NEW ZEALAND
PATENTS ACT 1953
COMPLETE SPECIFICATION

Title of Invention:

Apparatus for supporting an animal and a production line for processing an animal
incorporating said apparatus

Name, address and nationality of
applicant(s) as in international
application form:

CHAIN SHEARING PTY LTD, an Australian company of 1/277 Great Eastern
Highway, Belmont, Western Australia, Australia 6104

272969

SUBSTITUTION OF APPLICANT
UNDER SECTION 24
CHAIN SHEARING PTY LTD
27/8/97.

NEW ZEALAND
PATENTS ACT 1953
COMPLETE SPECIFICATION



"APPARATUS FOR SUPPORTING AN ANIMAL AND A PRODUCTION LINE FOR
PROCESSING AN ANIMAL INCORPORATING SAID APPARATUS"

263 *6521*
We, ~~ALFRED WYBROW & RHONDA WYBROW, both Australian citizens of~~
~~CHAIN SHEAR PTY LIMITED, an Australian company of 1/277 Great Eastern~~
~~Cantabilling Road, Badgingarra~~
~~Highway, Belmont, Western Australia, Australia 6104,~~ hereby declare the invention, for
which we pray that a patent may be granted to us, and the method by which it is to be
performed, to be particularly described in and by the following statement:

APPARATUS FOR SUPPORTING AN ANIMAL AND A PRODUCTION LINE
FOR PROCESSING AN ANIMAL INCORPORATING SAID APPARATUS

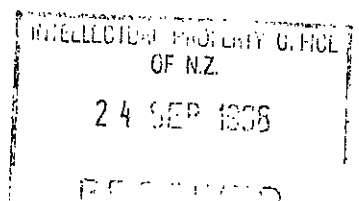
The present invention relates to an apparatus for supporting an animal and, a production line for processing that animal incorporating said apparatus and, in particular, but not exclusively, to an apparatus for supporting a sheep and a production line for shearing a sheep supported on said apparatus.

Conventionally, a sheep is wholly shorn by one shearer. Indeed, payment for shearing is made on the basis of the number of sheep shorn by a shearer. Shearing the whole sheep is physically very demanding as the sheep must be constantly lifted and turned in order to completely remove the fleece. While the quickest shearers can completely shear a sheep within about 60 seconds, the vast majority take considerably longer. Nevertheless, irrespective of how quickly a sheep can be shorn by a single shearer, the need to constantly turn and lift this sheep results in inefficiencies in the shearing process.

The present invention was developed with a view to providing an apparatus for supporting an animal and a production line for processing an animal supported on such an apparatus which reduces the physical demand on the animal processor and/or assists in reducing the time required to process the animal.

According to one aspect of the present invention there is provided an apparatus for supporting an animal including:

substantially symmetrical first and second sheet like elements arranged side by side for supporting an animal therebetween, the sheet like elements having a substantially concave depression formed in a central region of their respective facing surfaces and being further profiled so as to dispose an animal supported therebetween in a manner that facilitates stretching of the skin of the animal;



support means for supporting said first and second sheet like elements in the manner so that the position of one of said elements can be varied relative to the other;

5 whereby, in use, said apparatus can support animals of different size between said first and second sheet like elements by operation of said support means to vary the position of one of said parts relative to the other.

10 According to another aspect of the present invention there is provided a production line having a plurality of stations for the sequential processing of an animal, said production line comprising:

15 an apparatus in accordance with the first aspect of the present invention; and,

 conveying means for conveying said apparatus sequentially to a number of said stations;

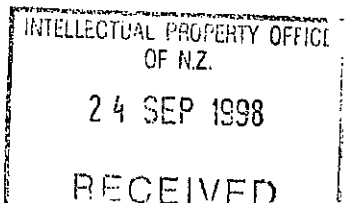
20 whereby, in use, said animal can be processed by processing predetermined parts of said animal at each station as said animal is conveyed through said production line.

 Preferably said production line further comprises transferring means for transferring said animal from a holding pen onto said apparatus.

25 Preferably said transferring means comprises a race leading from said pen to an enclosure, said enclosure elevated above the ground and adapted for pivotal movement so that, in use, an animal held in said enclosure can be tipped onto said apparatus by pivoting said enclosure.

30 Preferably said conveying means conveys said apparatus about a closed loop path, said path having a lower run along which said animal can be processed and an upper run for returning said apparatus to an initial one of said stations, said upper run being disposed above the
35 lower run.

 Preferably said production line further comprises computer means for correlating a unique identifier of an



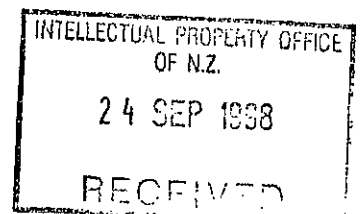
272969

- 3 -

animal processed by said production line with the difference in weight for that animal prior to and after processing.

5 Preferably said production line further comprises means for automatically reading and storing said unique identifier.

10 Preferably said computer further comprises data entering means for entering data concerning said animal and correlating said data with said unique identifier for a particular animal.



In an alternate embodiment, each of said parts comprises a sheet-like element wherein the surface of said sheet-like element which faces the other part, is profiled so as to dispose an animal supported between said parts in a manner to facilitate stretching of the skin of said animal.

5
10
Preferably said support means comprises two arms and motive means acting on at least one of said arms for moving one arm relative to the other, wherein said first part is attached to one of said arms and the second part is attached to the other arm.

Preferably said arms are pivotally connected together at a location intermediate their length.

15
According to another aspect of the present invention there is provided a production line having a plurality of stations for the sequential processing of an animal, said production line comprising:

20
an apparatus in accordance with the first aspect of the present invention; and,
conveying means for conveying said apparatus sequentially to a number of said stations;

25
whereby, in use, said animal can be processed by processing predetermined parts of said animal at each station as said animal is conveyed through said production line.

30
Preferably said conveying means conveys said apparatus about a closed loop path, said path having an upper run along which said animal can be processed and a lower run for returning said apparatus to an initial one of said stations, said lower run disposed beneath said upper run.

35
Preferably said first and second parts separate in such a manner so as to dispose said first and second parts under said lower run when said apparatus reaches a first point in said path where said upper run turns into said lower run, and said first and second parts come together when said apparatus reaches a second point in said

path where said lower run turns into said upper run.

Preferably said arms are arranged to pivot in a first direction away from each other when said apparatus reaches said first point and to pivot in an opposite
5 direction when said apparatus reaches said second point.

Preferably said production line further comprises a conveyor belt disposed between said apparatus and said stations for carrying said animal when dismounted from said apparatus.

10 Preferably said production line further comprises transferring means for transferring said animal from a holding pen onto said apparatus.

Preferably said transferring means comprises a race leading from said pen to an enclosure, said enclosure
15 elevated above the ground and adapted for pivotal movement so that, in use, an animal held in said enclosure can be tipped onto said apparatus by pivoting said enclosure.

In an alternate embodiment, said conveying means conveys said apparatus about a closed loop path, said path
20 having a lower run along which said animal can be processed and an upper run for returning said apparatus to an initial one of said stations, said upper run being disposed above the lower run.

Preferably said production line further
25 comprises:

Preferably said production line further comprises computer means for correlating a unique identifier of an animal processed by said production line with the difference in weight for that animal prior to and after
30 processing.

Preferably said production line further comprises means for automatically reading and storing said unique identifier.

Preferably said computer further comprises data
35 entering means for entering data concerning said animal and correlating said data with said unique identifier for a particular animal.

Embodiments of the present invention will now be described by way of example only, with reference to the accompanying drawings in which:

5 Figure 1 is a plan view of a first embodiment of the apparatus for supporting an animal shown on the production line for processing the animal;

Figure 2 is a side elevation view of the apparatus and a portion of the production line shown in Figure 1;

10 Figure 3 is a plan view of the production line shown in Figures 1 and 2; and,

Figure 4 is a schematic representation of a tipper used in the production line for transferring an animal from a holding pen onto the apparatus;

15 Figure 5 is a perspective view of a second embodiment of the apparatus for supporting an animal;

Figure 6 is a side view of the apparatus shown in Figure 5 with an animal supported therein;

20 Figure 7 is a side view of the apparatus shown in Figure 5;

Figure 8 is an end view of a support means for supporting the apparatus shown in Figures 5-7;

Figure 9 is a side view of the support means shown in Figure 8; and,

25 Figure 10 is a side view of a conveyor system for the apparatus shown in Figures 5-9.

30 As shown in the accompanying drawings with particular reference to Figures 1 and 2 an apparatus 10 for supporting an animal such as a sheep (not shown) in varying positions comprises substantially symmetrical first and second parts 12 and 14 arranged side by side. Each part comprises a first elongate support means in the form of a cylindrical member 16 having an arcuate circumferential surface on which a sheep can be rolled and a wing 18
35 extending from a length 20 of the cylindrical member 16 for providing support to the sheep from one side. A sheep can be supported on and between the first and second parts 12,

14 typically on its back or on one side with the fore portion of the sheep between the wings 18. The position of the sheep can be varied by rolling the sheep on one or both of the cylindrical members 16.

5 Each length 20 extends from a point intermediate the length of its corresponding cylindrical member 16 to an end 22 of that member. The members 16 are configured so that the length 20 are mutually convergent and are closest together at the ends 22. Each cylindrical member 16 also
10 includes a length 21, contiguous with length 20, where the lengths 21 of the members 16 are substantially mutually parallel.

 Each wing 18 extends from a side of its corresponding member 16 most distant the other member 16.
15 As seen most clearly in Figure 2, the wings 16 are arcuate in shape and formed with a concaved surface 24, the wings being arranged so that the concaved surfaces 24 face each other.

 Each part 12, 14 is supported on a corresponding
20 base 26 which includes a spring 28 allowing one end of a particular part to be elevated relative to an opposite end by applying a downwardly directed force to that opposite end.

 As shown in Figures 2 and 3, the apparatus 10 can
25 be used as part of a production line 30 having a plurality of stations 32a-32f for processing (shearing) a sheep. A shearer is located at each station for shearing a particular portion of the sheep. The production line 30 includes a conveying means in the form of a chain 34
30 configured and driven so as to travel in the closed loop path. A pair of arms 36 is coupled to the chain 34 and which supports the first and second parts 12 and 14 respectively via the springs 28. The arms 36 are configured so as to allow a conveyor belt 38 to pass
35 between the apparatus 10 and the stations 32.

 The chain 34 conveys the apparatus 10 along an upper run to allow processing of the animal at stations

32a-32d (as shown in Figures 1, 2 and 3) and a lower run of the chain in which the apparatus 10 is disposed beneath the conveyor belt 38 for return to the initial station 32a. A mechanism (not shown) is provided for causing the arms 36 to pivot in the manner so as to dispose the first and second parts 12, 14 to be under the lower run (and therefore under the conveyor belt 38) when the apparatus 10 reaches a point 40 in the closed loop path where the upper run turns into the lower run. A further mechanism (not shown) is provided at the other end of the closed loop path to pivot the arms 36 back into the position shown in Figures 1, 2 and 3 so that the apparatus 10 is located above the upper run of the chain and therefore above the conveyor belt 38.

Another mechanism (not shown) is also provided for varying the spacing between the parts 12 and 14 to accommodate animals of different sizes. One realisation of this mechanism is a hydraulic ram in each arm 36 which can be selectively extended or retracted to vary the spacing between the arms and accordingly vary the spacing between the parts 12 and 14. This mechanism in conjunction with the base 26 and arms 36 form a support means for the apparatus 10.

The conveyor belt 38 extends from the first station 32a to the end station 34f. A number of oddment chutes 42a-42d are provided adjacent stations 32a-32d respectively for the deposit wool oddments. After shearing at station 32d, the sheep is removed from the apparatus 10 and supported on its side on conveyor belt 38 so as to travel to stations 32e and 32f for further shearing. After shearing at station 32f, the sheep is placed onto ramp 44 and led away from the production line 30 into a yard. At stations 32e and 32f the fleece is finally removed from the sheep and transported by the conveyor belt 38 to a fleece conveyor 46. The fleece conveyor carries the fleece away from the production line 30 for classing and bailing.

It is envisaged that the production line 30 may also include scales or other means for weighing the sheep 104 both prior to processing and after processing so that the weight of the fleece produced by particular sheep can be logged. The production line 30 can also include a computer for correlating the fleece weight with a unique identifier for each sheep. In this regard, if each sheep is provided with say a coded ear tag, an ear tag reader coupled with the computer can be used to read the ear tag number so as to, for example, set up a file for that particular sheep to which further data or information relating to the sheep can be added. Accordingly, a wool classer may make preliminary classifications for the fleece of a particular sheep and enter details of those classifications by the computer into the file generated for that sheep. Further, the computer can be used to segregate sheep of a particular set of characteristics. This may be achieved, for example by, controlling a series of dye jets at or after the final station 32f for marking sheep of a particular set of characteristics with dye of a predetermined colour, or alternately to control a plurality of exists from the production line 30 to separate pens for sheep of particular characteristics.

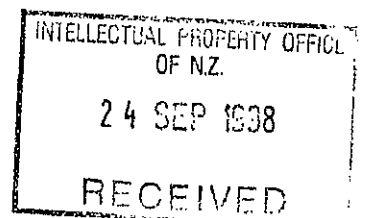
Referring now to Figures 3 and 4, a transferring means comprising a race 48 and enclosure 50 are provided for transferring a sheep from a holding pen (not shown) onto the apparatus 10 at station 32a. The race leads to the enclosure 50 which is pivotally supported above the ground on a beam 52. A tipper arm 54 is connected to the enclosure 50 to facilitate pivoting of the enclosure between the first upright position shown in Figure 4 in which a sheep can be walked into the enclosure to a second position pivoted 90° from the first in which the sheep is placed on its side and can be slid onto the apparatus 10.

A second embodiment of the apparatus for supporting the sheep is shown in Figures 5-7. The apparatus is designated generally as item number 100 and

272980

comprises substantially symmetrical first and second parts 102 arranged side by side for supporting an animal, such as for example, a sheep 104 therebetween. Each part 102 is in the form of a sheet-like element having a surface 106 which
5 faces the other part 102 that is profiled so as to dispose the sheep 104 supported between the parts 102 in the manner to facilitate stretching the skin of the sheep 104. Each surface 106 has a central concave portion 108 and smaller convex portions 110 and 112 spaced by the concave portion
10 108. The concave area 108 and convex areas 110, 112 are designed to fit around the shape of the sheep 104, pull the wool down stretching out the skin wrinkles on the belly and legs and push into the sheep to stretch out the legs, in a manner similar to that achieved by stretching out sheep in
15 traditionally shearing.

Referring to Figures 8 and 9, the apparatus 100 is supported by support means 114 in a manner so that the position of one of the parts 102 can be varied relative to position of the other part 102. In the illustrated
20 embodiment, the support means 114 is in the form of a pair of arms 116 which are hinged together at a point 118 intermediate their length. An upper end 120 of either or both of the arms 116 can be coupled to a motive means such as an electric, hydraulic or pneumatic motor or ram for
25 moving that arm relative to the other. Lower end 122 of each arm 116 has an integrally formed rail 124 extending in a plane perpendicular to that containing the respective arm 116. Each part 102 is demountably attached to the respective rail 124. It is envisaged that the demountable
30 attachment can be by way of mechanical fasteners or by forming complimentary portions on the lower edge of each part 102 and on the rail 124 to allow engagement therebetween. This provides for the ability to readily change the size and shape of the parts 102 to suit the
35 average physical characteristics of a particular mob eg., for crossbred wetters, mario ewes, small lambs etc.



By moving one of the arms 116 relative to the other, the position of one of the parts 102 also varies relative to the other part 102. In the illustrated embodiment, the variation in position includes both a variation in the angle of inclination of each part 102 as well as a variation in the separation or distance between the parts 102. However, it is envisaged that the support means 114 can be constructed in other ways so as to vary only the angle of inclination of the parts 102 relative to each other, or only the distance between the parts 102.

The apparatus 110 is supported by the supporting means 114 of short distance, for example 9cm to 10cm above the stations 32. However, when this specific embodiment of the apparatus 100 is used, the stations 32 of the production line 30 are modified so as to each include a transversely extending hump 126 of a height approximately equal to the height of the apparatus 100 above the conveyor belt 38. The hump 126 is disposed centrally of each station 32. Accordingly, when the apparatus 100 is disposed at the centre of each station 32, the back of the sheep 104 held between the parts 102 will be supported by the hump 126.

Referring to Figure 10, it can be seen that the apparatus 100 is conveyed by conveying system 128 in a closed vertical loop above the conveyor belt 38. The movement of the apparatus 100 is synchronised with that of the conveyor belt 38. The upper ends 120 of the support means 114 for each apparatus 100 is pivotally attached to drive chains 130 of the conveying system 128 so that the apparatuses maintain substantially the same disposition as the drive chain 130 travels in an endless vertical loop.

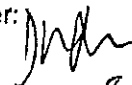
Now that embodiments of the invention have been described in detail it will be apparent to those skilled in the various arts that numerous modifications and variations may be made without departing from the basic inventive concepts. For example, although the production line is shown as having only one apparatus 10, any number of

272969

- 12 -

apparatuses 10 (or 100) can be used in the production line. In addition, any number of stations 32 can be placed along the production line. In order to increase the stability of the apparatus 10, the parts 12 and 14 can be made to touch
5 at an end containing the wings 18. Alternatively, the first part 12 can be provided with an elongate arm and the second part 14 provided with a recess for receiving one end of the arm to rigidify the apparatus 10. All such modifications and variations are deemed to be within the
10 scope of the present invention, the nature of which is to be determined from the foregoing description.

CHAIN SHEAR PTY LTD
by the authorised agent
KNOWLES & ASSOCIATES
per:



8 September 1995

WHAT WE CLAIM IS:

1. An apparatus for supporting an animal including:

substantially symmetrical first and second sheet like elements arranged side by side for supporting an animal therebetween, the sheet like elements having a substantially concave depression formed in a central region of their respective facing surfaces and being further profiled so as to dispose an animal supported therebetween in a manner that facilitates stretching of the skin of the animal;

support means for supporting said first and second sheet like elements in the manner so that the position of one of said elements can be varied relative to the other;

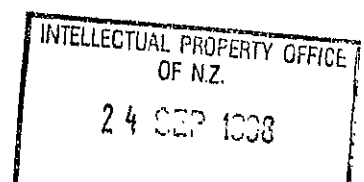
whereby, in use, said apparatus can support animals of different size between said first and second sheet like elements by operation of said support means to vary the position of one of said parts relative to the other.

2. An apparatus according to claim 1, wherein said surface of each sheet-like element is further provided with substantially convex protrusions on each side of said concave depression.

3. An apparatus according to claim 1 or 2, wherein said support means is operable to vary the distance between said first and second parts.

4. An apparatus according to any one of claims 1 to 3, said support means is operable to vary the angle of inclination of one part relative to the other part.

5. An apparatus according to any one of claims 1 to 4, wherein said support means comprises two arms and



motive means acting on at least one of said arms for moving one arm relative to the other, wherein said first sheet like element is attached to one of said arms and the second sheet like element is attached to the other arm.

5 6. An apparatus according to claim 5, wherein said arms are pivotally connected together at a location intermediate their length.

10 7. An apparatus according to claim 5 or 6, wherein each arm is provided with means for demountably coupling individual ones of said parts to said support means, whereby, in use, said parts can be changed to accommodate animals of different physical characteristics.

15 8. A production line having a plurality of stations for the sequential processing of an animal, said production line comprising:

an apparatus according to any one of claims 1 to 7; and,

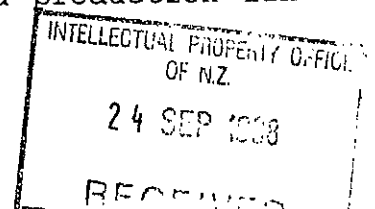
conveying means for conveying said apparatus sequentially to a number of said stations;

20 whereby, in use, said animal can be processed by processing predetermined parts of said animal at each station as said animal is conveyed through said production line.

25 9. A production line according to claim 8, further comprising means for weighing said animal prior to the commencement of processing of said animal, and means for weighing said animal after processing; and,

means for logging the difference in weight prior to and after processing.

30 10. A production line according to claim 9, further comprising computer means for correlating a unique identifier of an animal processed by said production line



272969

- 1~~7~~ -

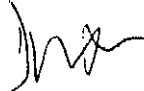
with the difference in weight for that animal prior to and after processing.

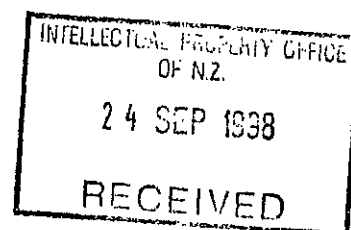
5 11. A production line according to claim 10, further comprising means for automatically reading and storing said unique identifier.

10 12. A production line according to claim 11, wherein said computer further comprises data entering means for entering data concerning said animal and correlating said data with said unique identifier for a particular animal.

13. A production line according to any one of claims 8 to 12, further including transferring means for transferring said animal from a holding pen onto said apparatus.

15 14. A production line according to claim 13, wherein said transferring means includes a race leading from said pen to an enclosure, said enclosure elevated above the ground and adapted for pivotal movement so that, in use, an animal held in said enclosure can be tipped onto
20 said apparatus by pivoting said enclosure.

(CHAIN SHEARING PTY LIMITED)
by the authorised agent
KNOWLES & ASSOCIATES
per: 



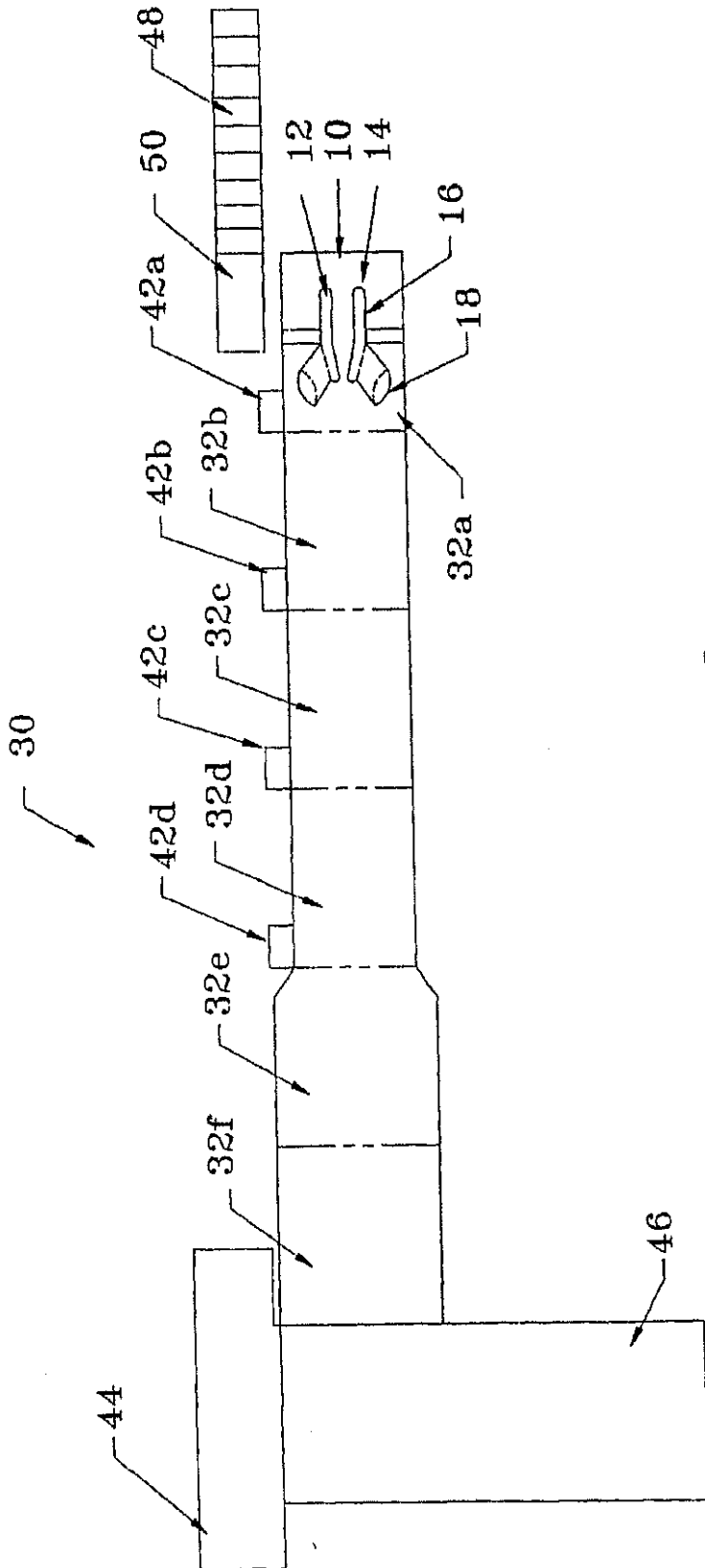


FIG 3

Chain Shear Pty Ltd
by the authorised agent
KNOWLES & ASSOCIATES
18/3/96

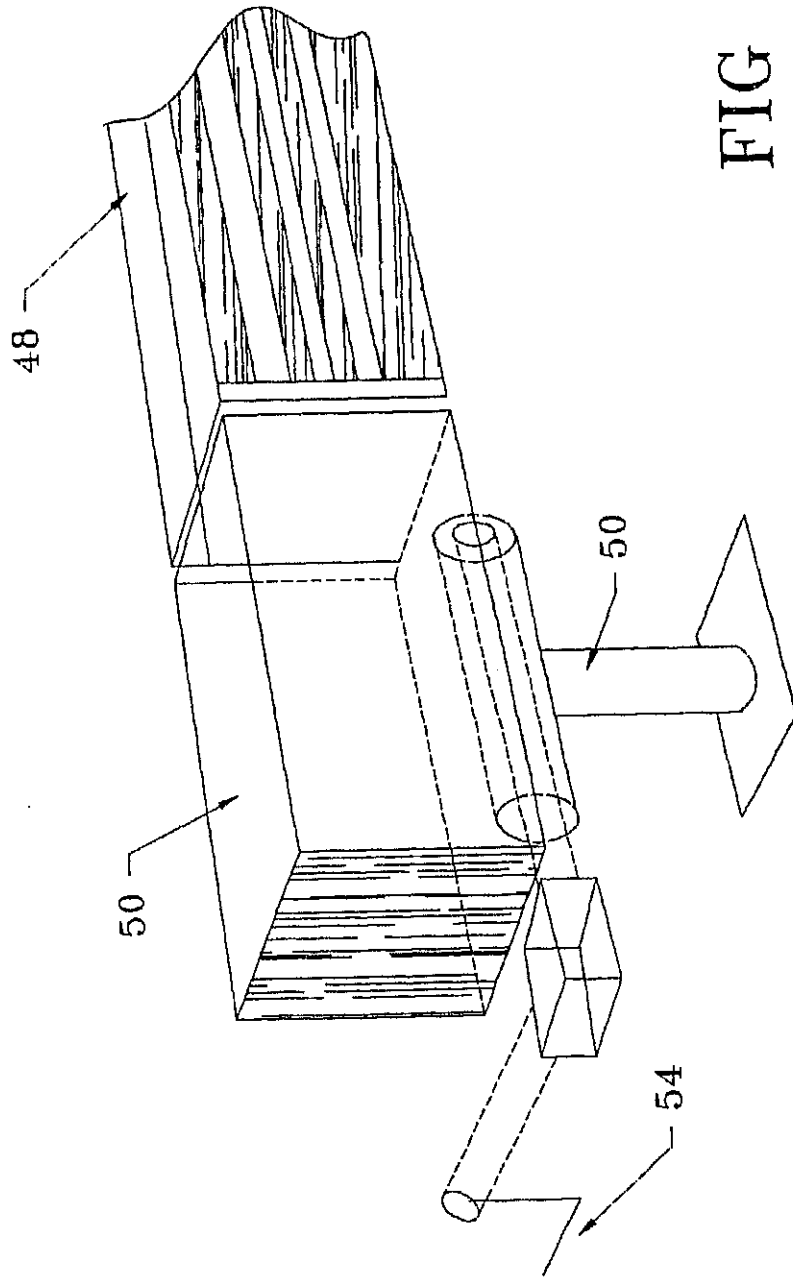
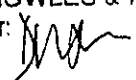


FIG 4

~~Chavin Shear Pty Ltd~~
by the authorised agent
KNOWLES & ASSOCIATES
per:  18/3/96

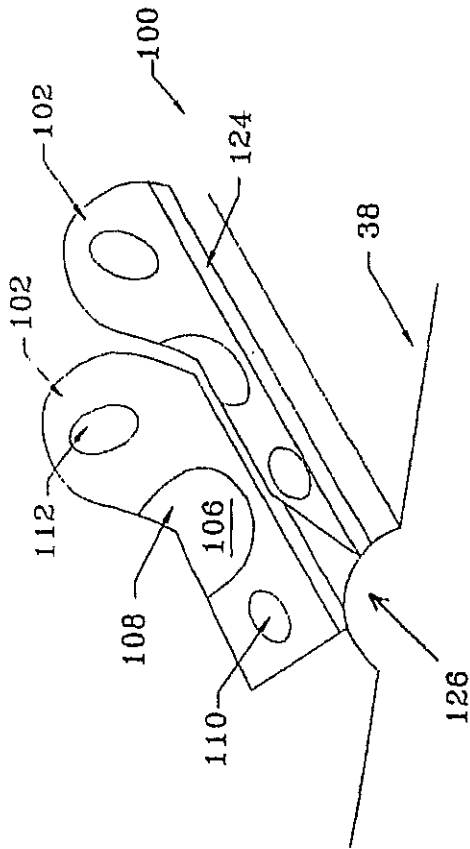


FIG 5

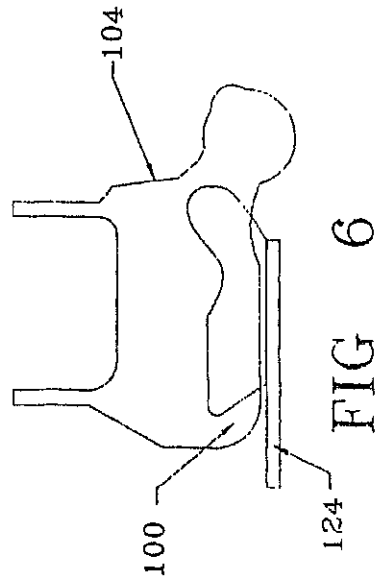


FIG 6

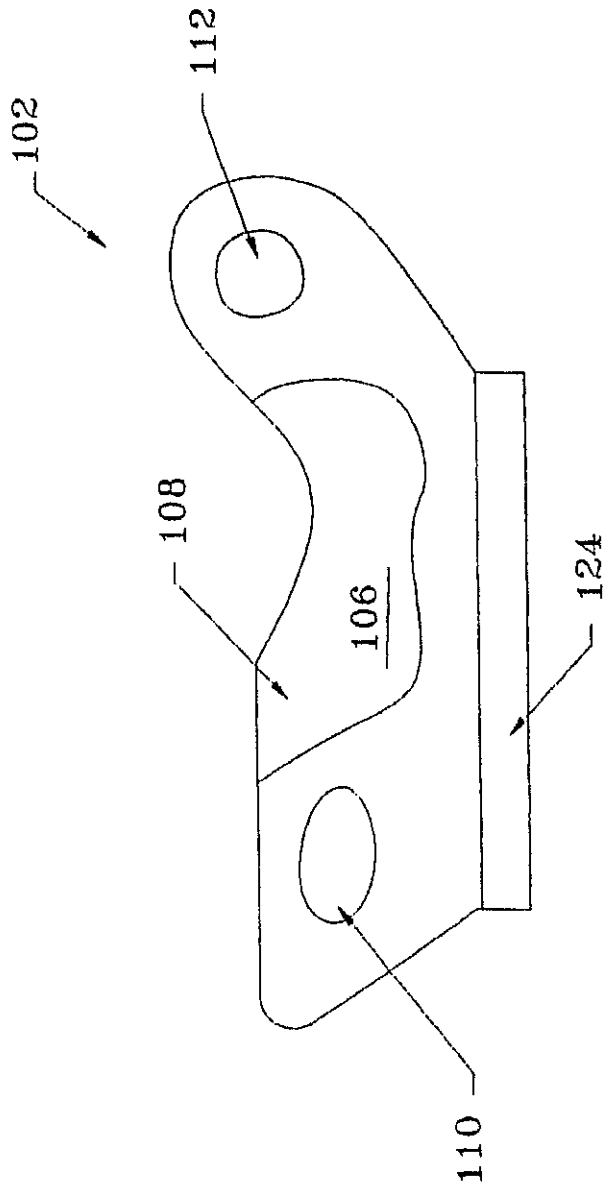


FIG 7

~~Chain Shear Pty Ltd~~
by the authorised agent
KNOWLES & ASSOCIATES
per *[Signature]* 18/3/96

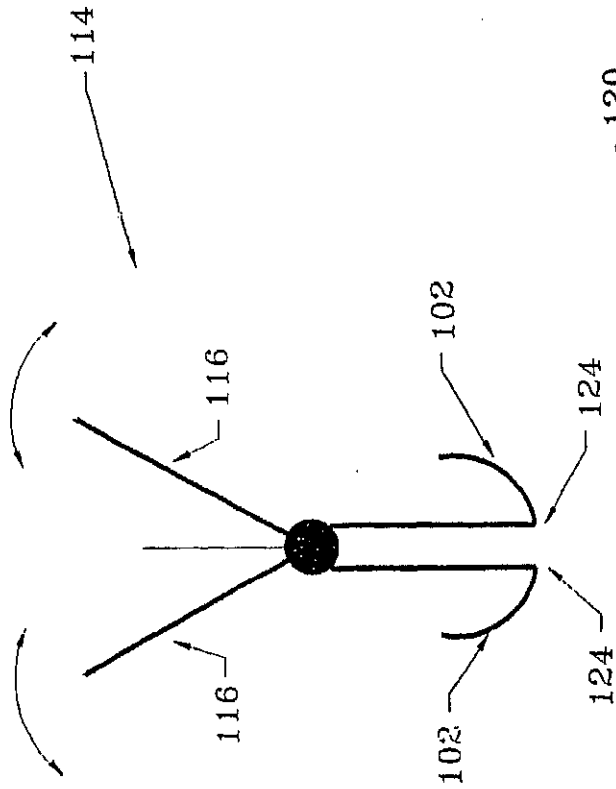


FIG 8

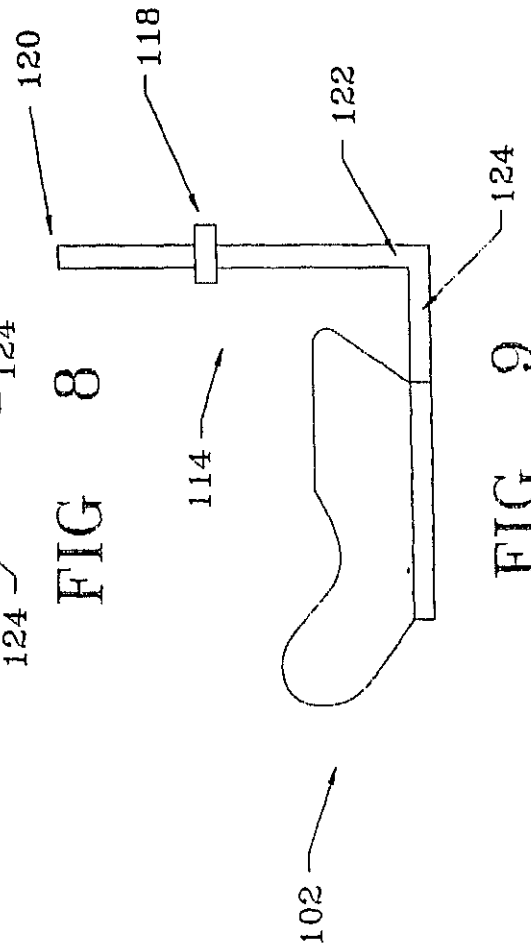


FIG 9

~~Chain Shear Pty Ltd~~
by the authorised agent
KNOWLES & ASSOCIATES
per *[Signature]* 18/3/96

7/7

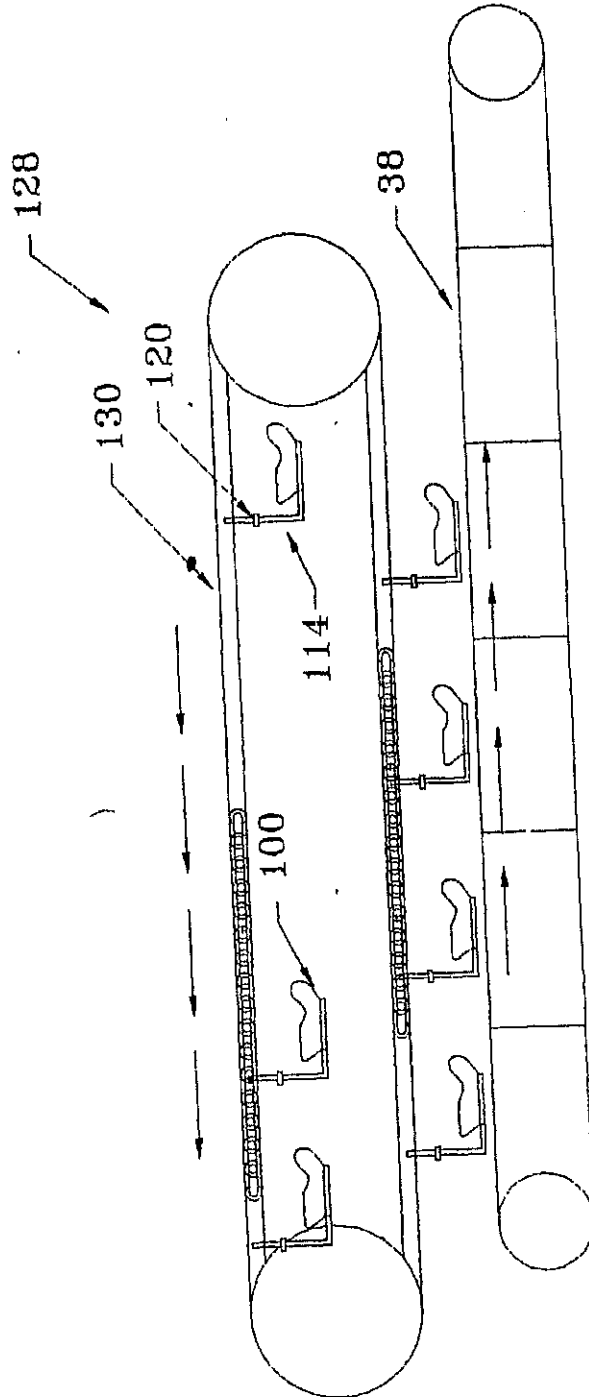
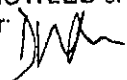


FIG 10

~~Chamra Shear Pty Ltd~~
by the authorised agent
KNOWLES & ASSOCIATES
per  18/3/96

END