

# **PATENT SPECIFICATION**

**AUSTRALIA**

**SHEAREXPRESS PTY LTD**

**LIMB RESTRAINT**

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**AUSTRALIA**  
**PATENTS ACT 1990**  
**PROVISIONAL SPECIFICATION**

**FOR THE INVENTION ENTITLED:**

**"LIMB RESTRAINT"**

**The invention is described in the following statement:-**

## Limb Restraint

### Field of the Invention

- 5 The present invention relates to a limb restraint, particularly, for restraining the limbs of an animal.

### Background of the Invention

- 10 When handling animals such as sheep, from time-to-time it becomes necessary to restrain one or more of their limbs in order to carry out husbandry, or other, procedures. Various types of limb restraints are known and used for such purposes. The simplest form of restraint is a length of rope or cord for binding one or more limbs to a fixed member such as a post.

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Another type of restraint commonly used is in the form of a metallic shackle or cuff in the shape of a closed loop having a gate which can be selectively opened or closed to allow limbs to be passed and withdrawn from the loop.

### 20 Summary of the Invention

According to a first aspect of the present invention there is provided a limb restraint for an animal including:

- 25 a first member and a second member, said first and second members moveable relative to each other between a closed position and an open position, said members relatively configured so that when moved to said closed position said first and second members define a space closed sufficiently to prevent the withdrawal of an animal limb therefrom, and when moved to said opened position define an opening therebetween  
30 through which a limb can be inserted into or withdrawn from said space;

an elastic element coupled between said first and second members and extending across said opening; and,

a releasable locking mechanism having an engaged state which allows said first and second members to be moved together in a plurality of positions which progressively reduce the size of said opening and prevents said first and second members from being moved in a manner to increase the size of said opening, and a disengaged state allowing  
5 said first and second members to be moved in a manner to increase the size of said opening.

Preferably said release locking mechanism is in the form of a ratchet mechanism.

10 Preferably said ratchet mechanism includes a ratchet gear fixed to said first member and a pawl biased into contact with said ratchet gear.

Preferably said releasable locking mechanism includes a linkage having one end engaging said pawl and an opposite end by which an operator can manipulate said  
15 linkage to release said pawl from said ratchet gear, placing said releasable locking mechanism in said disengaged state whereby said first and second members can be moved toward said open position.

Preferably said first member is pivotally coupled to a support and said second member  
20 is fixed to said support.

Preferably said elastic element is adjustably coupled at at least one end to one of first and second members to facilitate adjustment of a length of said element extending  
25 between said members.

Preferably each of said first and second elements is provided with an aperture through which respective ends of said elastic element pass, and respective stops engaging portions of said elastic element that extend through said apertures at locations outside of  
30 said space to prevent said portions of said elastic element from being drawn into said space.

According to the invention there is provided a dual limb restraint for an animal

including:

first and second restraints, each restraint in accordance with the first aspect of the present invention;

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said first and second restraints coupled to a common support and disposed relative to each other so that one of each of a pair of limbs of an animal can be restrained by respective restraints.

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Preferably each of said first and second restraints includes respective first and second linkages, each linkage having one end engaging a pawl of a respective restraint and an opposite end by which an operator can manipulate that linkage to release said pawl from an associated ratchet gear, said opposite ends disposed so that an operator can manipulate said linkages together with one hand.

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#### Brief Description of the Drawings

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

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Figure 1 is a plan view of an embodiment of the limb restraint;

Figure 2 is a side view of the restraint shown in Figure 1;

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Figure 3 is a bottom view of the restraint shown in Figures 1 and 2;

Figure 4 is a side view of a first of first and second members incorporated in the limb restraint; and,

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Figure 5 is a side view of the second of the members.

### Detailed Description of Preferred Embodiment

Referring to the accompanying drawings, a limb restraint 10 for an animal (not shown) includes a first member 12 and a second member 14 which are moveable relative to each other. The members 12 and 14 are relatively configured so that when moved to a closed position (illustrated in Figure 3 by the relative juxtaposition of a first member 12c and second member 14c) they define a space 16 which is closed sufficiently to prevent the withdrawal of an animal's limb therefrom. The first and second members 12 and 14 can be moved to an opened position (as shown in Figure 3 by the juxtaposition of first member 12o and second member 14) to define an opening 18 therebetween through which a limb can be inserted into or withdrawn from the space 16. An elastic element in the form of an elastic band 20 is coupled between the first and second members 12 and 14 and extends across the opening 18. The restraint 10 also includes a releasable locking mechanism 22 for releasably locking the first and second members 12 and 14 together in a plurality of positions which progressively reduce the size of the opening 18.

Each of the first and second members 12 and 14 is in the form of a plate which is bent or otherwise formed into a configuration similar to a reversed letter "S". More particularly, the member 12 includes a first portion 24 which is curved concavely when viewed from inside the space 16 and a second contiguous portion 26 which curves away convexly from one end of the first portion 24. The first portion 24 has a length greater than that of the second portion 26.

The second member 14 includes a first portion 28 and a second portion 30 which are shaped in a mirror image to the portions 24 and 26 of the first member 12. However, as is evident from Figures 4 and 5, the first and second members 12 and 14 are not exact mirror images of each other. An end 32 of the member 12 distant the first portion 26 is formed with two spaced apart tubular collars 34 for receiving a bolt 36. On the other hand, end 38 of the member 14 distant its second portion 30 is provided with a tubular sleeve 40 which is adapted to fit between the collars 34 and register therewith so that the bolt 36 can pass through the collars and sleeve 40 to pivotally couple the first and

second members 12 and 14 together.

The first and second members 12,14 are each formed with a transverse extending slot 41 and 43 respectively, through which the elastic element 20 extends.

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Referring to Figure 3, it can be seen that when the first and second members 12 and 14 are in the closed position, the respective second portions 26 and 30 form a guide converging towards the space 16. The respective first portions 24 and 28 define a generally circular region within which the space 16 is located.

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The first and second members 12 and 14 are coupled to a support in the form of a base plate 42. More particularly, the member 14 is fixed, typically by welding, to the base plate 42 with the bolt 46 passing through a hole (not shown) formed in the base plate 42 to thereby pivotally couple the first member 12 to the base plate 42 as well as the second member 14.

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The releasable locking mechanism 22 is in the form of a ratchet mechanism having a ratchet gear 44 and a pawl 46. The ratchet gear 44 is fixed to the first member 12 typically by welding, while the pawl 46 is pivotally coupled via a bolt 48 to the base plate 42.

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The ratchet gear 44 is provided with an arcuate face 50 in which is formed a plurality of first v-shaped recesses 52 which commence from an edge 53 of the ratchet gear 44 nearest the first member 12. The recesses 52 terminate at a location about half way along the arc length of the face 50. A further recess 54 is formed in the face 50 and spaced from the first recesses 52.

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The pawl 46 is in the form of a bent arm having a tooth 56 at one end engaging with one of the recesses 52 and 54 on the ratchet gear 44. The pawl 46 is also provided with a cavity 58 on a side opposite the tooth 56 for seating a spring 60 which biases the pawl 46 against the arcuate surface 50 of the ratchet gear 44, thereby placing the locking mechanism 22 in an engaged state.

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A spring retaining block 62 is fixed to the base plate 42 adjacent the pawl 46 on a side

opposite the ratchet gear 44 and is arranged to seat an opposite end of the spring 60.

In the absence of any countering force, the spring 60 biases the pawl 44 against the arcuate surface 50 of the ratchet gear 44. With the releasable locking mechanism 22 in the engaged state, if the tooth 56 were in the recess 54 the first member 12 could be moved toward the second member 14 to reduce the size of the opening by action of the pawl 46 pivoting about bolt 48 against the bias of spring 60. The pawl 46 would in this instance engage successive recesses 52 progressively reducing the size of the opening 18. It will be appreciated that while the tooth 56 is seated in one of the recesses 54 or 52, the first and second members 12 and 14 cannot be moved in an opposite direction to increase the size of the opening 18.

A mechanical linkage 64 is provided to selectively disengage the pawl 46 from the ratchet gear 44, which can be viewed as equivalent to placing the releasable locking mechanism 22 in a disengaged or released state. When in the disengaged state the releasable locking mechanism 22 allows the first and second members 12 and 14 to be moved in a manner to increase the size of the opening 18.

The linkage 64 includes a lever 66 which extends along one side of the base plate 42 and is provided with an upturned foot 68 which passes through an elongated slot 70 formed in the base plate 42 between the ratchet gear 44 and the pawl 46. An end of the lever 66 opposite the foot 68 is provided with a bifurcation arm 72 which is pivotally coupled via a pivot pin 74 to a handle 76 which in turn is pivotally coupled via a bolt 78 to the base plate 42. A spring 80 is supported on the base plate 42 biasing the handle 76 in a direction forcing the foot 68 of the lever 66 against an end of the slot 70 nearest the ratchet gear 44. This has the effect of preventing the pawl 46 from pivoting toward the first member 12 due to abutment with the foot 68.

The elastic band 20 is in the form of a strip of rubber having opposite ends 82 and 84 which extend through the slots 41 and 43 of the members 12 and 14 respectively. The ends 82 and 84 also pass through respective stops 86 and 88 disposed on the outside of the space 16 which prevents the ends 82 and 84 from being pulled through the respective slots back into the space 16. The stops 86 and 88 also allow adjustment of

the length of the elastic band within the space 16. The stops 86 and 88 can be in any conventional form including, for example, a buckle through which the ends 82 and 84 are threaded. The length of the elastic band 20 within the space 16 is selected so that the band is under tension when a limb is held within the restraint 10.

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The ratchet mechanism 22 is arranged to ordinarily prevent the pivoting of the first member 12 from the closed position to the opened position. In order to allow such pivoting motion, the handle 76 must be pulled or otherwise manipulated so as to rotate about the bolt 78 in a clockwise direction (when viewed in relation to Figure 1). This motion causes the foot 68 of the lever 66 to pivot the pawl 46 about bolt 48 away from the ratchet gear 44.

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The typical use and operation of the restraint 10 will now be described.

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In order to engage an animal's limb, such as a sheep's leg, the restraint 10 is opened by pulling on the handle 76 to allow the first member 12 to be pivoted to a position where the tooth 56 on the pawl 44 engages the recess 54 in the ratchet gear 44. In this configuration, the opening 18 is opened to its maximum extent. The sheep's limb is then passed into the opening 18 between the respective second portions 26 and 30 until it engages on the elastic band 20. The foot is then pushed against the elastic band 16 causing the first member 12 to pivot in a direction progressively closing the opening 18.

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During such pivoting motion, the pawl 46 which is biased by the spring 60 against the arcuate face 50 will eventually reach the first recesses 52. Depending on the size of the sheep's limb, the length of the band 20 within the space 16, and the force applied to the limb, the tooth 56 will finally settle in one of the recesses 52, which may not necessarily be the recess adjacent the edge 53 of gear 44. Accordingly, there may be situations where the opening 18 is not fully closed to the extent that the first and second members 12 and 14 are in contact or immediately adjacent. The opening 18 may remain partially open 18 so that a gap exists between the respective inflection points of the members 12 and 14, but not open to an extent whereby the limb can pass therethrough.

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The resilience of the band 20 and its high friction co-efficient prevent the limb from being withdrawn from the restraint 10.



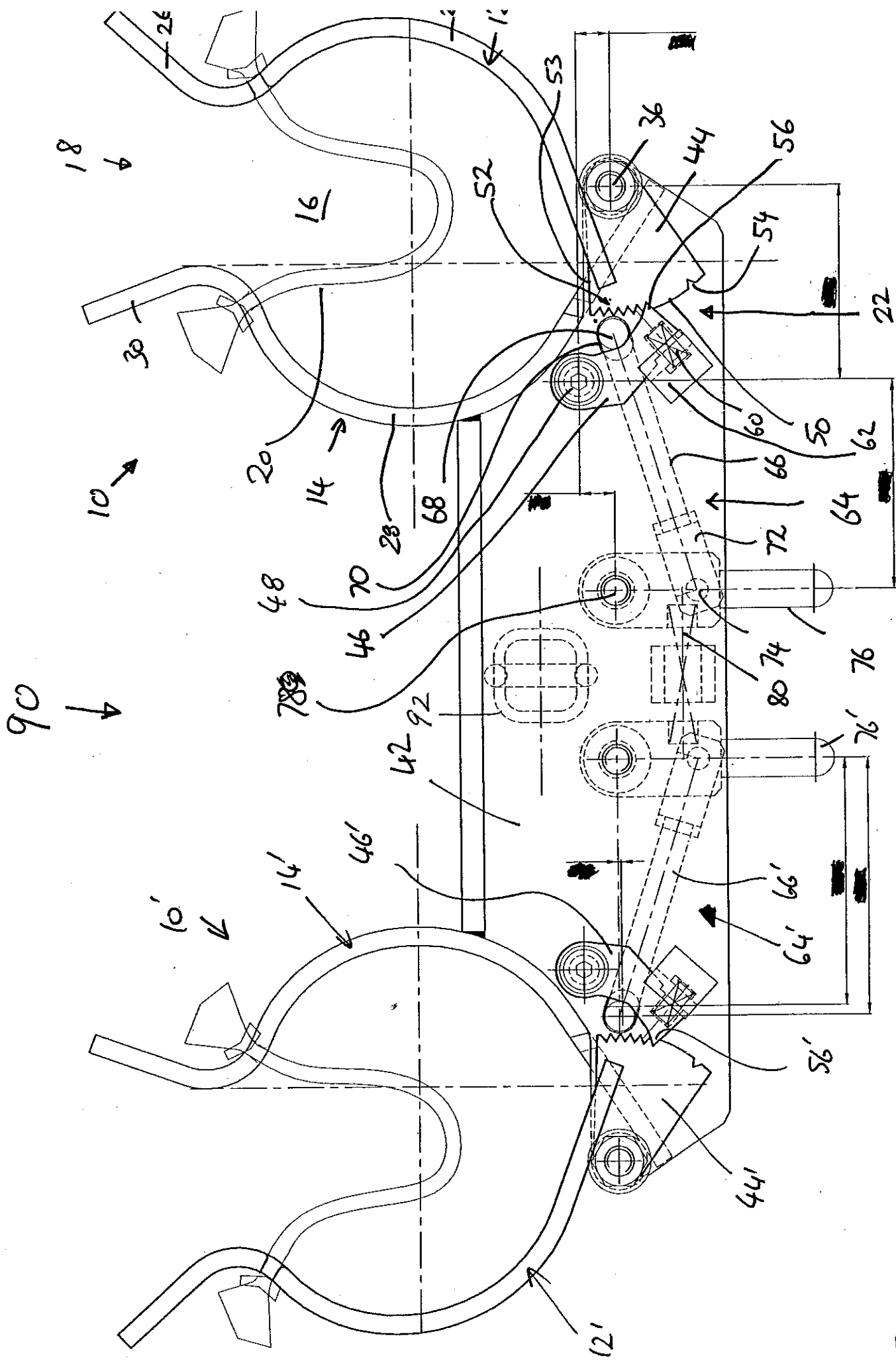
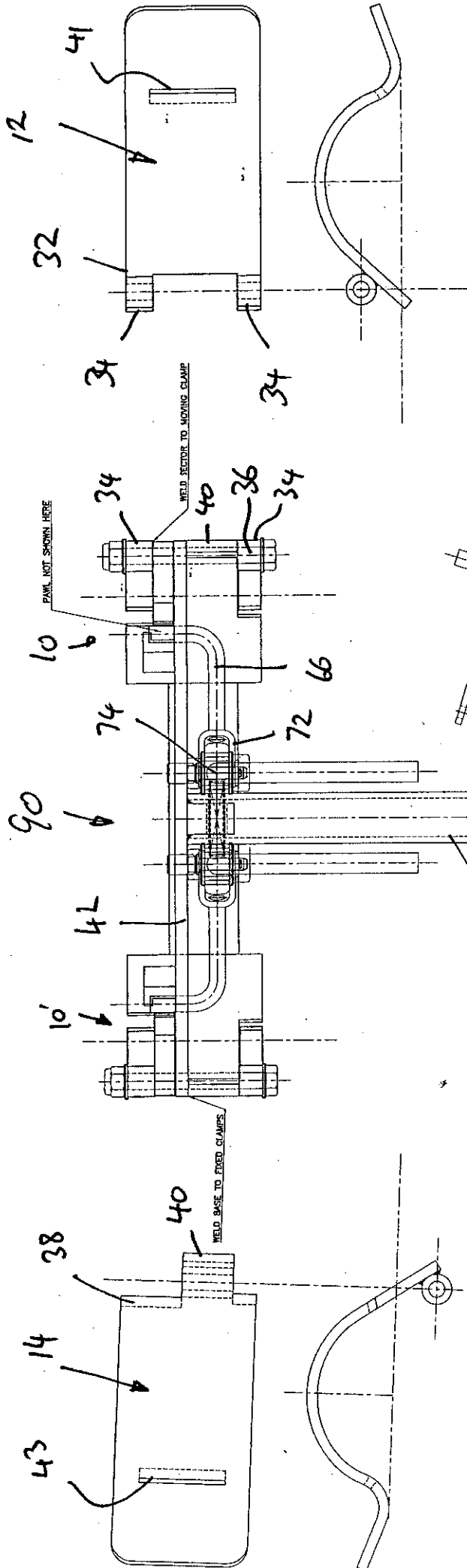


FIG 1



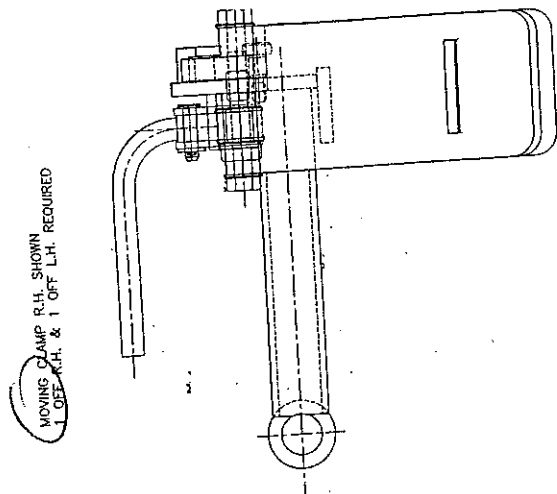
FIXED CLAMP R.H. SHOWN  
 1 OFF R.H. & 1 OFF L.H. REQUIRED

FIGS

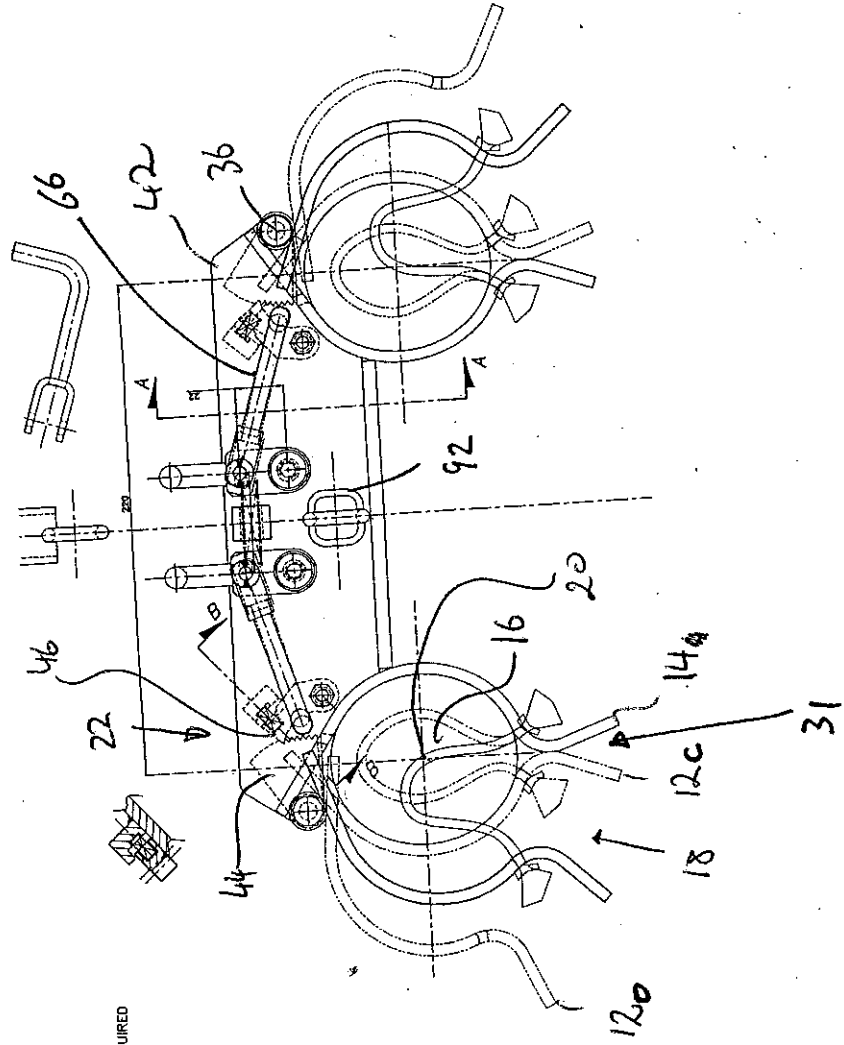
FIG2

MOVING CLAMP R.H. SHOWN  
 1 OFF R.H. & 1 OFF L.H. REQUIRED

FIG4



MOVING CLAMP R.H. SHOWN  
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FIXED CLAMP R.H. SHOWN  
1 OFF R.H. & 1 OFF L.H. REQUIRED

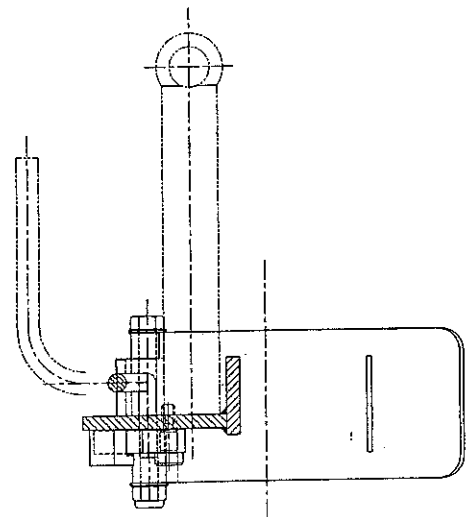


FIG 3