

# **PATENT SPECIFICATION**

AUSTRALIA

SHEAREXPRESS PTY LTD

“HANDLING APPARATUS FOR A QUADRAPED”

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**AUSTRALIA**

**PATENTS ACT 1990**

**PROVISIONAL SPECIFICATION**

FOR THE INVENTION ENTITLED:

**"HANDLING APPARATUS FOR A QUADRAPED"**

The invention is described in the following statement:-

## Handling Apparatus for a Quadraped

### Field of the Invention

5 The present invention relates to a handling apparatus for a quadraped and particular, though not exclusively, to a handling apparatus for a sheep.

### Background to the Invention

10 The present Applicant and its predecessor in business has been particularly innovative in the field of rural harvesting. In particular, the Applicant is the Applicant and Patentee for numerous inventions in relation to processes and apparatus for harvesting wool with increased efficiency.

15 Some of the processes and apparatus require a sheep to be lifted from a holding pen to an elevated position where a wool harvesting process can be effected. Hitherto, the most commonly used method for lifting sheep is simply to provide an inclined race leading to a holding pen which is elevated to a required height and then dragging or tipping the sheep from the pen to a processing station.

20 The present invention was developed with a view to providing an alternate apparatus for handling sheep and in particular lifting sheep between two vertically separated locations. However, the apparatus is not so limited and may be applied for the general handling of other quadrapeds.

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### Summary of the Invention

According to the present invention there is provided a handling apparatus for a quadraped including at least:

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a holding box for holding a quadraped, said holding box formed with a plurality of spaced apart slots;

a cradle provided with a plurality of spaced apart curved fingers for cradling said quadraped; and,

5 a transport system to which said cradle is coupled for transporting said cradle from beneath said holding box, through said holding box where said fingers travel through said slots to pick up a quadraped held in said holding box, to an unloading point spaced from said holding box where said quadraped is unloaded from said cradle.

10 Preferably said holding box includes a floor and first and second side walls extending upwardly from opposite sides of said floor, wherein each slot includes a series of coplanar, first channels, floor channels and second channels, each first channel extending from an upper edge of said first wall to said floor, each floor channel extending from one end of a corresponding first channel across said floor to one end of a corresponding  
15 second channel, each second channel extending from a corresponding floor channel to an upper edge of said second wall.

Preferably at least one of said first and second walls is pivotally coupled to said floor.

20 Preferably said floor includes a first guide section which is inclined upwardly from a first of said floor channels toward a first end of said holding box.

Preferably said floor includes a second guide section which is inclined upwardly from a last of said floor channels toward a second end of said holding box.

25 Preferably said transport system returns said cradle to beneath said holding box from said unloading point without passing said cradle through said holding box.

30 Preferably said transport system includes a conveyor to which said cradle is coupled and a mechanism for moving said conveyor between a first position where said cradle travels through said holding box as it is transported in a first direction from beneath said holding box to said unloading point, and a second position where said cradle travels in a

second opposite direction from said unloading point to beneath said holding box without passing through said holding box.

5 Preferably said transport system includes a support structure to which said conveyor is pivotally coupled at an end nearest said unloading point and said mechanism is coupled between said support structure and said conveyor.

10 Preferably said mechanism includes a ram pivotally coupled at one end to said support structure and pivotally coupled at an opposite end to said conveyor at a location between where said conveyor is pivotally coupled to said support structure and an end of said conveyor distant said unloading point.

15 Preferably said cradle is pivotally coupled to said conveyor; and, said handling apparatus includes a first cam member attached to said cradle and a second cam member attached to said conveyor, said first and second cam members engaging as said cradle approaches said unloading point to cause said cradle to pivot to tip said quadraped towards said unloading point.

#### Brief Description of the Drawings

20

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

25 Figure 1 is a schematic representation of a holding box incorporated in the handling apparatus;

Figure 2 is a side view of the handling box shown in Figure 1 together with a race and decoy pen;

30 Figure 3 is a side view of the hand apparatus in an initial position with a sheep held in the holding box;

Figure 4 is a side view of the handling apparatus with the sheep lifted to a standby position;

5 Figure 5 is a side view of the handling apparatus with a sheep tipped towards an unloading position and a second sheep held in the holding box;

Figure 6 is a side view of the handling apparatus with a sheep in the unloaded position;

10 Figure 7 is a side view of the handling apparatus in a retracted position; and,

Figure 8 is a front view of a portion of the apparatus.

#### Detailed Description of Preferred Embodiment

15 Referring to the accompanying drawings and in particular Figures 1-4, it can be seen that a handling apparatus 10 for a quadraped such as a sheep 12 includes a holding box 14 for holding the sheep 12, a cradle 16 on a transport system 18. The holding box 14 is provided with a plurality of spaced apart slots 20a-20f (hereinafter referred to in general as "slots 20"). The cradle 16 is provided with a plurality of spaced apart curved fingers  
20 22 (one for each slot 20) for cradling the sheep 12. The cradle 16 is coupled to the transport system 18 which transports the cradle 16 from a position beneath the holding box (seen in Figures 3 and 7), through the holding box 14 where the fingers 22 travel through the slots 20 to pick up the sheep 12 held in the box 14, to an unloading point 98 (shown in Figure 5) which is spaced from the holding box 12 and where the sheep 12 is  
25 unloaded from the cradle 16.

Referring now particularly to Figures 1 and 2, the holding box 14 includes a floor 24, and first and second side walls 26 and 28 extending generally upwardly from opposite sides of the floor 24. Each of the slots 20a-20f includes a series of respective co-planar  
30 first channels 30a-30f (hereinafter referred to in general as "first channels 30"), floor channels 32a-32f (hereinafter referred to in general as "floor channels 32") and second channels 34a-34f (hereinafter referred to in general as "second channels 34"). Each of

the first channels 30 extend from an upper edge 36 of the first wall 26 to the floor 24. Each floor channel 32 extends across the floor 24 from one end of the corresponding first channel 30 to one end of a corresponding second channel 34, and each second channel 34 extends from a corresponding floor channel 32 to an upper edge 38 of the second wall 28. For example, slot 20a includes first channel 30a extending from an upper edge 36 from wall 26 to the floor 24, a floor channel 32a which extends from first channel 30a to an adjacent end of corresponding second channel 34a, the second channel 34a then extending upwardly along the second wall 28 to the edge 38.

10 The floor 24 is composed of a plurality of separate co-planar floor panels 40b-40f (hereinafter referred to in general as "floor panels 40"). The first side wall 26 is composed of parallel incline first wall panels 42a-42g (hereinafter referred to in general as "first wall panels 42"). The first wall panels 42 are fixed relative to the corresponding floor panels 40. The second wall 28 is composed of second wall panels 15 44a-44f (hereinafter referred to in general as "second wall panels 44"). The second wall 28 is pivotally coupled to the floor 24 by a bracket 46 and pivot pins 48 (only one shown) to allow the second wall 28 to be pivoted toward and away from the first wall 26 to allow for adjustment in the width of the holding box 14.

20 Each of the second wall panels 44 is attached by respective pairs of laterally extending upper and lower arms 50 and 52 to upper and lower common rails 54 and 56 respectively.

The floor 24 also includes first and second guide sections 58 and 60. The guide section 25 58 is inclined upwardly from first of the floor channel 32a toward a first or front end 62 of the holding box 14. The guide section 58 includes a sloped panel 58a of sheet metal. Similarly, the guide section 60 includes a sloping panel 60a of sheet metal. The effect of the guide sections 58 and 60, and corresponding panels 58a and 60a, is to assist in positioning the sheeps rear and hind legs inside of the first floor channel 32a and the last 30 floor channel 32f.

A standard inclined race 66 is used for leading a sheep 12 from a holding pen (not

shown) into the holding box 14. A decoy pen 68 is positioned on the opposite side of the holding pen 14 for holding a sheep 70. The sheep 70 is used to assist in inducing sheep 12 to walk into the holding pen 14 and also to assist in preventing the sheep 12 from wanting to walk any further forward.

5

The transport system 18 includes a conveyor 71 having a frame 72 and a pair of endless chains 74 supported on the outside of the frame 72. The chains 74 are driven in unison by a motor 76. The chains 74 each pass through respective upper sprockets 78. The transport system 18 is pivotally coupled to a support structure 80 by respective stub  
10 axles 82 of the sprockets 78 which are rotatably supported in bearings 84 which are in turn attached to the support structure 80.

The cradle 16 is pivotally coupled to a carriage 86 which in turn is coupled to the chains 74. A first cam member in the form of pins 88 extend laterally from arms 90 coupled to  
15 the cradle 16. A second cam member in the form of profiled cam plates 92 are attached to the top of the frame 72.

A mechanism in the form of a ram 94 for moving, or more particularly swinging, the transport system 18 is coupled between the support structure 80 and the transport system  
20 18. The ram 94 is pivotally coupled at one end to the support structure 80 and pivotally coupled at an opposite end to the frame 72 via an arm 96.

When the apparatus 10 is first used, a sheep 70 is lead up the race 66 through the pen 14 and locked in the decoy pen 68. Next, a sheep for processing is lead up the race 66 into  
25 the pen 14. When entering the pen 14, the sheep 12 steps over the guide 58 and will have its front and rear legs inside of, or at the very least not fully behind, the floor channels 32f and 32a respectively. The ram 94 is in an extended position swinging the frame 72 outwardly away from the support structure 80 and the motor 76 operated to drive the cradle 16 to its lowest point along the frame 72. In this position, the cradle 16  
30 is disposed beneath the holding 14 box as shown in Figure 3 to transport the sheep 12 to the unloading point 98. An operator now activates the motor 76 causing the cradle 16 to travel in the upward direction. Consequently, the fingers 22 of the cradle 16 pass

through respective slots 20a-20f and pick up the sheep 12 elevating the sheep from the pen 14 (shown in Figure 4). The fingers 22 cradle the sheep 12 around its belly, neck and backside. As the cradle 16 approaches the unloading point 98 the cam pins 88 engage the cam plates 92. This causes the cradle 16 to pivot thereby tilting the sheep 12 towards the unloading point 98 as shown in Figure 5. This process in effect tips the sheep 12 on its side from where an operator can grab the sheep and easily pull it onto a table 100 to commence processing. During this process, a further sheep 12 is being lead up the race 66 and into the holding box 14.

Once the operator has pulled the sheep 12 onto the table 100, the operator then activates the ram 94 causing it to retract and thus swinging the frame 72 inwardly toward the support structure 80, and also activates the motor 76 causing the cradle 16 to travel back down the frame 72. Due to the retraction of the ram 94, as the cradle 16 is being returned to its lowest position, it does not pass through the holding box 14 and thus does not contact the sheep 12 held therein. In order to now lift that sheep to the unloading point 98 and onto the table 100, the operator operates the ram 94 causing it to extend and thus swinging the frame 72 away from the support structure 80 to the position shown in Figure 1. The process may then be repeated sequentially to lift further sheep 12 to the unloading point 98 and the table 100.

Now that an embodiment of the present invention has been described in detail it will be apparent to those skilled in the relevant arts that numerous modifications and variations may be made without departing from the basic inventive concepts. For example, the number of slots 20 formed in the holding box 14 and number of fingers 22 on the cradle 16 can be varied to suit the size and configuration of the quadruped to be transported by the apparatus 10. Further, the side wall 28 may be fixed rather than pivotally coupled. The inclined race 66 could be replaced with other types of delivery systems or apparatus to deliver a sheep to the holding box 14. Also, the ram 94 may be a hydraulic or pneumatic ram or alternately be replaced by an electric motor to achieve the same effect. Further, the degree of pivoting of the cradle 16 when reaching the unloading point can be varied by changing the configuration of the cam plates 92. Alternately the cam pins 88 and cam plate 92 used for pivoting the cradle 16 can be replaced with a pneumatic,

hydraulic or electrically operated ram to achieve the same effect.

All such modifications and variations are deemed to be within the scope of the present invention, the nature of which is to be determined from the above description.

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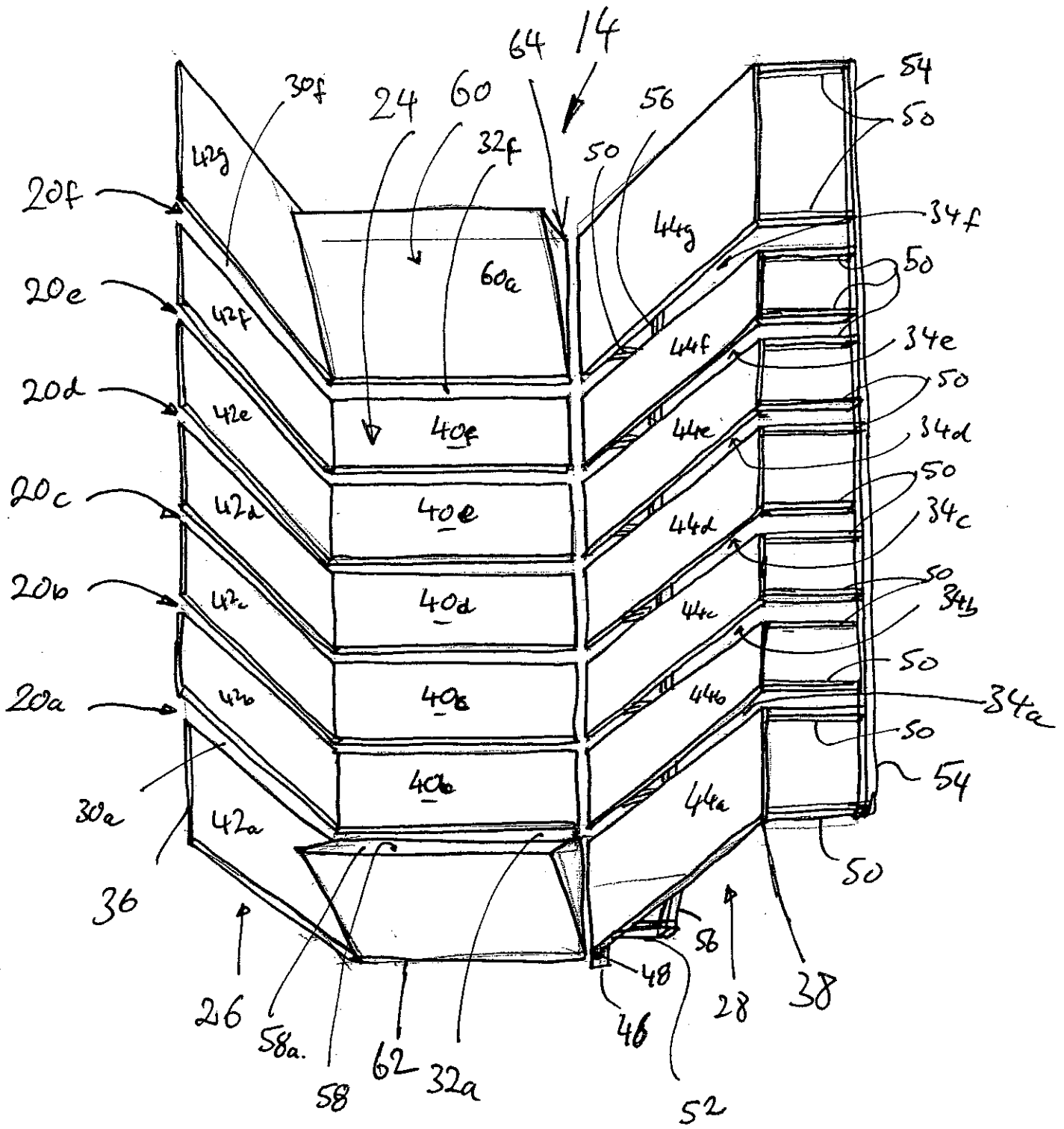


FIG 1



1. Sheep in Holding Box  
Lifter ready to lift sheep into Standby Position

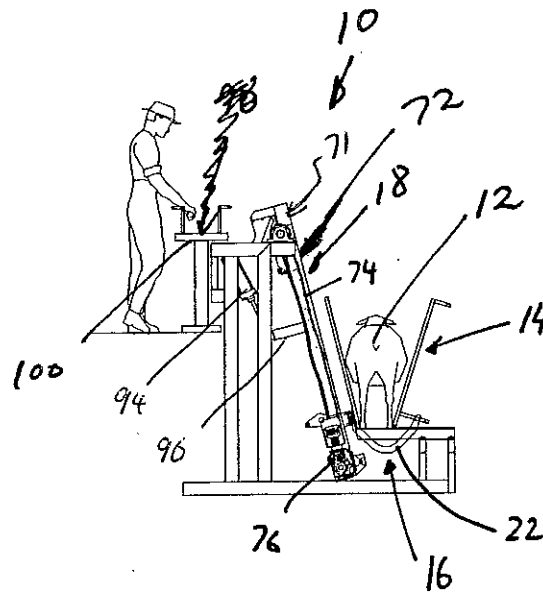


FIG 3

2. Sheep lifted into Standby Position

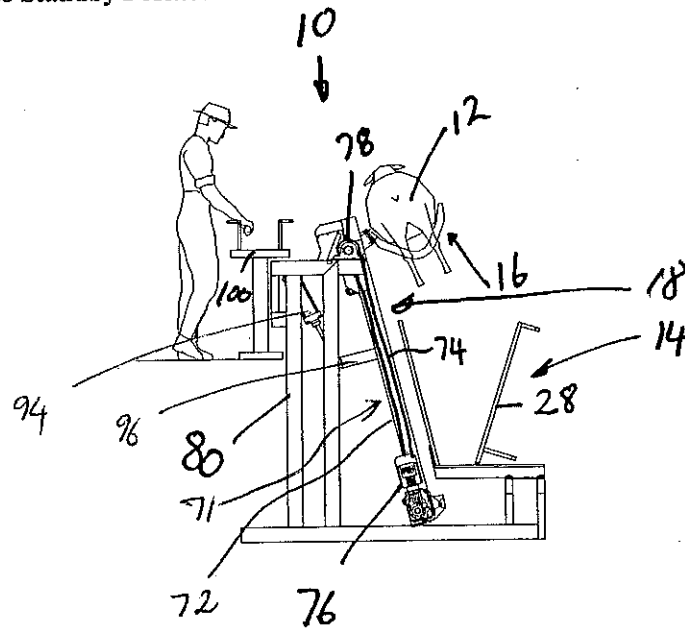
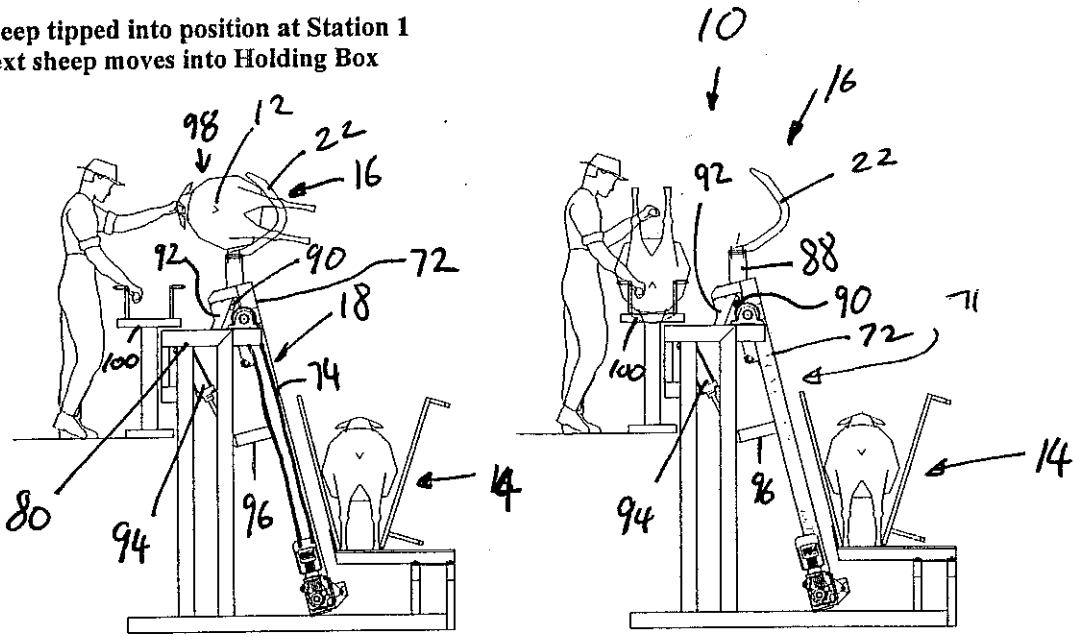
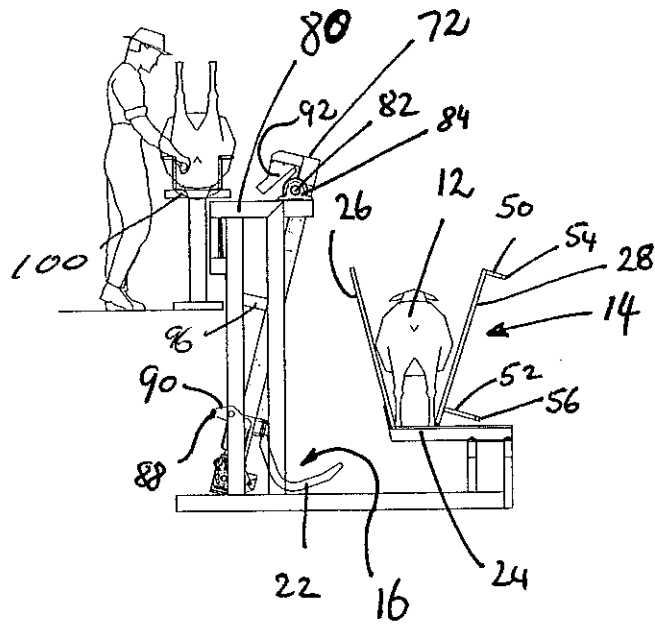


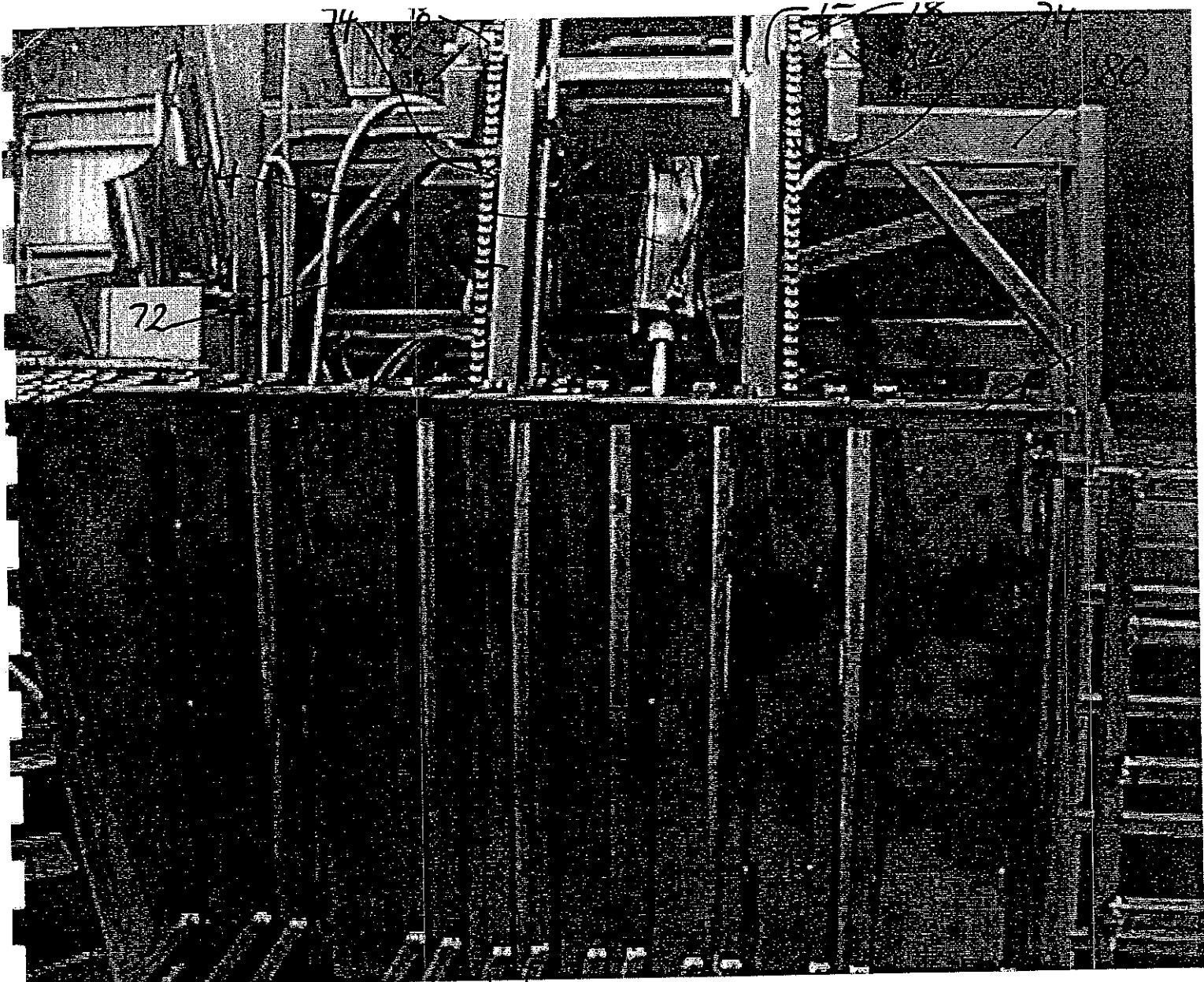
FIG 4

3. Sheep tipped into position at Station 1  
Next sheep moves into Holding Box



4. Lifter retracts and returns to lower position for next cycle





52 52 52

FIG 8