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(54) Title  
**Handling apparatus for a quadruped**

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Abstract

A handling apparatus 10 for a quadruped such as a sheep 12  
5 comprises a holding box 14 for holding the sheep 12, a  
cradle 16 and a transport system 18. The holding box 14 is  
provided with a plurality of spaced apart slots 20a-20f.  
The cradle 16 is provided with a plurality of spaced apart  
10 curved fingers 22 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 14,  
through the holding box 14 where the fingers 22 travel  
through respective slots 20 to pick up the sheep 12, and  
subsequently to an unloading point 98 which is spaced from  
15 the holding box 14 and where the sheep 12 can be unloaded  
from the cradle 16. The transport system 18 pivots the  
cradle 16 away from the holding box 14 as the cradle 16 is  
being returned to its lowest position so that the fingers  
22 do not pass through the box 14 on the return leg.

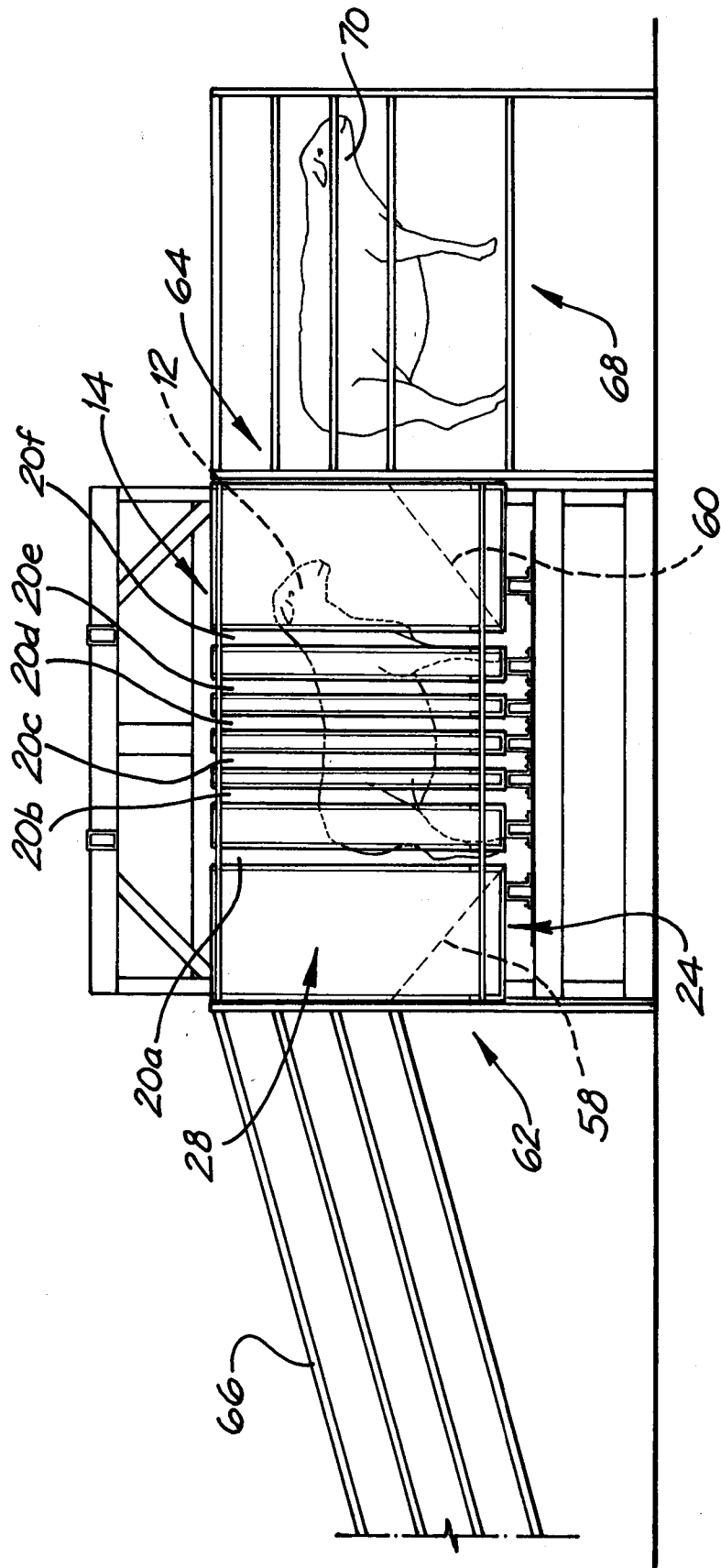


FIG. 2

**AUSTRALIA**

**PATENTS ACT 1990**

**COMPLETE SPECIFICATION FOR A**

**STANDARD PATENT**

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Standard Complete Specification for the invention entitled:

**HANDLING APPARATUS FOR A QUADRUPED**

Details of Associated Provisional Applications:

Application No.: 2002950992  
Date: 26 August 2002

The following is a full description of this invention,  
including the best method of performing it known to me:-

Handling Apparatus for a Quadruped

Field of the Invention

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

Background to the Invention

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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.

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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

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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 quadrupeds.

30

Throughout this specification the term "comprising" is used inclusively, in the sense that there may be other features and/or steps included in the invention not expressly defined or comprehended in the features or steps subsequently defined or described. What such other

35

features and/or steps may include will be apparent from the specification read as a whole.

Summary of the Invention

5

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

10 a holding box for holding a quadruped, 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 quadruped; and,

15 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 quadruped held in said holding box; to an unloading point spaced from said holding box where  
20 said quadruped is unloaded from said cradle.

Preferably said holding box comprises a floor and first and second side walls extending upwardly from opposite sides of said floor, wherein each slot includes a first channel  
25 leading to a floor channel which leads to a second channel, 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 second channel, each second  
30 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.

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

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

Preferably said transport system comprises 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.

Preferably said transport system comprises 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.

Preferably said mechanism comprises 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.

Preferably said cradle is pivotally coupled to said conveyor; and, said handling apparatus comprises a first cam member attached to said cradle and a second cam member attached to said conveyor, said first and second cam members engaging each other as said cradle approaches said

unloading point to cause said cradle to pivot to direct said quadruped towards said unloading point.

Brief Description of the Drawings

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

10 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;

15 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;

20

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;

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

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

30

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

Detailed Description of Preferred Embodiment

35 Referring to the accompanying drawings and in particular Figures 1-4, it can be seen that a handling apparatus 10 for a quadruped such as a sheep 12 comprises a holding box

14 for holding the sheep 12, a cradle 16 and 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  
5 plurality of spaced apart curved fingers 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  
10 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 14 and where the sheep 12 is unloaded from the cradle 16.

15 Referring now particularly to Figures 1 and 2, the holding box 14 comprises 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 respective first channel 30a-30f (hereinafter referred to  
20 in general as "first channels 30"), which leads to a respective floor channel 32a-32f (hereinafter referred to in general as "floor channels 32"), which then leads to a respective second channel 34a-34f (hereinafter referred to in general as "second channels 34"). Each of the first  
25 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  
30 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  
35 second channel 34a then extending upwardly along the second wall 28 to the edge 38.

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  
5 (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 44a-44f (hereinafter referred to in general as "second wall panels 44"). The  
10 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.

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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.

20 The floor 24 also includes first and second guide sections 58 and 60. The guide section 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  
25 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 sheep's rear and hind legs inside of the first floor channel 32a and the last floor channel 32f.

30

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  
35 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.

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  
5 respective upper sprockets 78. The transport system 18 is pivotally coupled to a support structure 80 by respective stub axles 82 of the sprockets 78 which are rotatably supported in bearings 84 which are in turn attached to the support structure 80.

10

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 the cradle 16. A second cam member in the form of  
15 profiled cam plates 92 is 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  
20 between the support structure 80 and the transport system 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.

25 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 the pen 14. When entering the pen 14, the sheep 12 steps over the guide 58 and will have its front and rear  
30 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.

35 In this position, the cradle 16 is disposed beneath the holding box 14 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).

5 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 or directing the sheep 12 towards the unloading point 98 as shown in  
10 Figure 5. This process in effect tips or turns 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.

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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  
20 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  
25 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  
30 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  
35 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  
5 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  
10 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  
15 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 and  
20 the appended claims.

The claims defining the invention are as follows:

- 5 1. A handling apparatus for a quadruped comprising:  
a holding box for holding a quadruped, said holding box  
formed with a plurality of spaced apart slots;  
a cradle provided with a plurality of spaced apart curved  
10 fingers for cradling said quadruped; and,  
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  
15 said slots to pick up a quadruped held in said holding box;  
to an unloading point spaced from said holding box where  
said quadruped is unloaded from said cradle.
- 20 2. The handling apparatus according to claim 1 wherein  
said holding box comprises a floor and first and second  
side walls extending upwardly from opposite sides of said  
floor, wherein each slot includes a first channel leading  
to a floor channel which leads to a second channel, each  
25 first channel extending from an upper edge of said first  
wall to said floor, each floor channel extending from one  
end of a corresponding second channel, each second channel  
extending from a corresponding floor channel to an edge of  
said second wall.
- 30 3. The handling apparatus according to claim 1 or 2  
wherein at least one of said first and second walls is  
pivotally coupled to said floor.
- 35 4. The handling apparatus according to claim 2 or 3  
wherein said floor comprises a first guide section which is  
inclined upwardly from a first of said floor channels  
toward a first end of said holding box.
5. The handling apparatus according to claim 4 wherein

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

- 5 6. The handling apparatus according to any one of claims 1-5 wherein said transport system returns said cradle to beneath said holding box from said unloading point without passing said cradle through said holding box.
- 10 7. The handling apparatus according to any one of claims 1-6 wherein said transport system comprises 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  
15 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.
- 20 8. The handling apparatus according to claim 7 wherein said transport system comprises a support structure to which said conveyor is pivotally coupled at an end nearest said unloading point and said mechanism is coupled between  
25 said support structure and said conveyor.
9. The handling apparatus according to claim 7 or 8 wherein said mechanism comprises a ram pivotally coupled at one end to said support structure and pivotally coupled at  
30 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.
- 35 10. The handling apparatus according to any one of claims 7-9 wherein said cradle is pivotally coupled to said conveyor; and, said handling apparatus comprises a first

cam member attached to said cradle and a second cam member  
attached to said conveyor, said first and second cam  
members engaging each other as said cradle approaches said  
unloading point to cause said cradle to pivot to direct  
5 said quadraped towards said unloading point.

11. A handling apparatus substantially as herein described  
with reference to and as illustrated by the accompanying  
drawings.  
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Dated this 22nd day of August 2003

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20 Fellows Institute of Patent and Trade Mark  
Attorneys of Australia



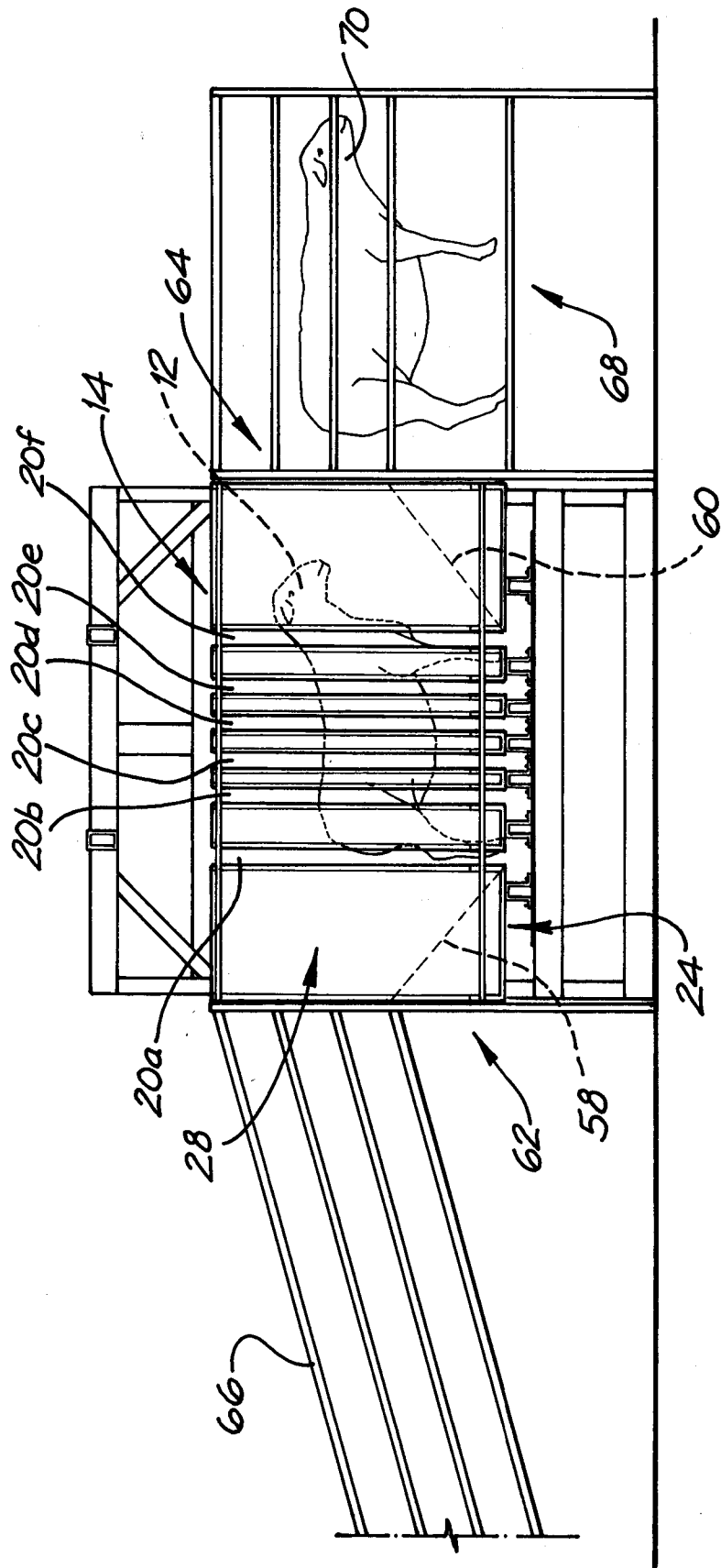


FIG. 2

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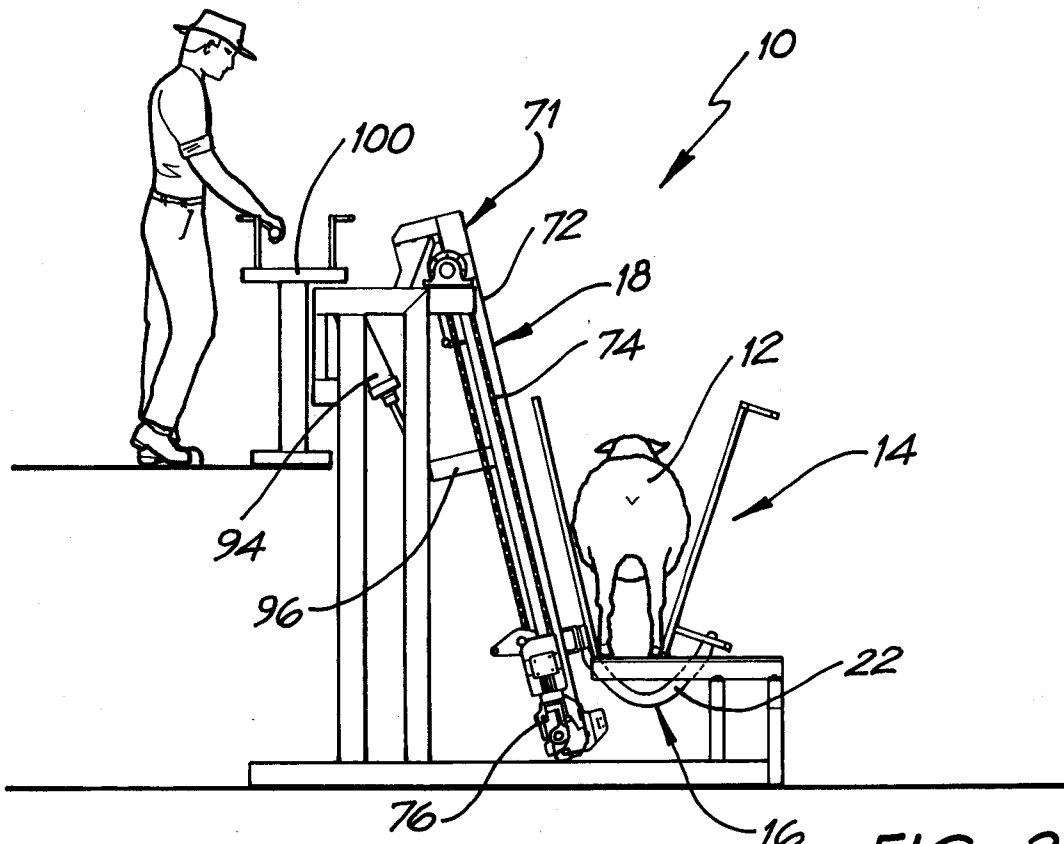


FIG. 3

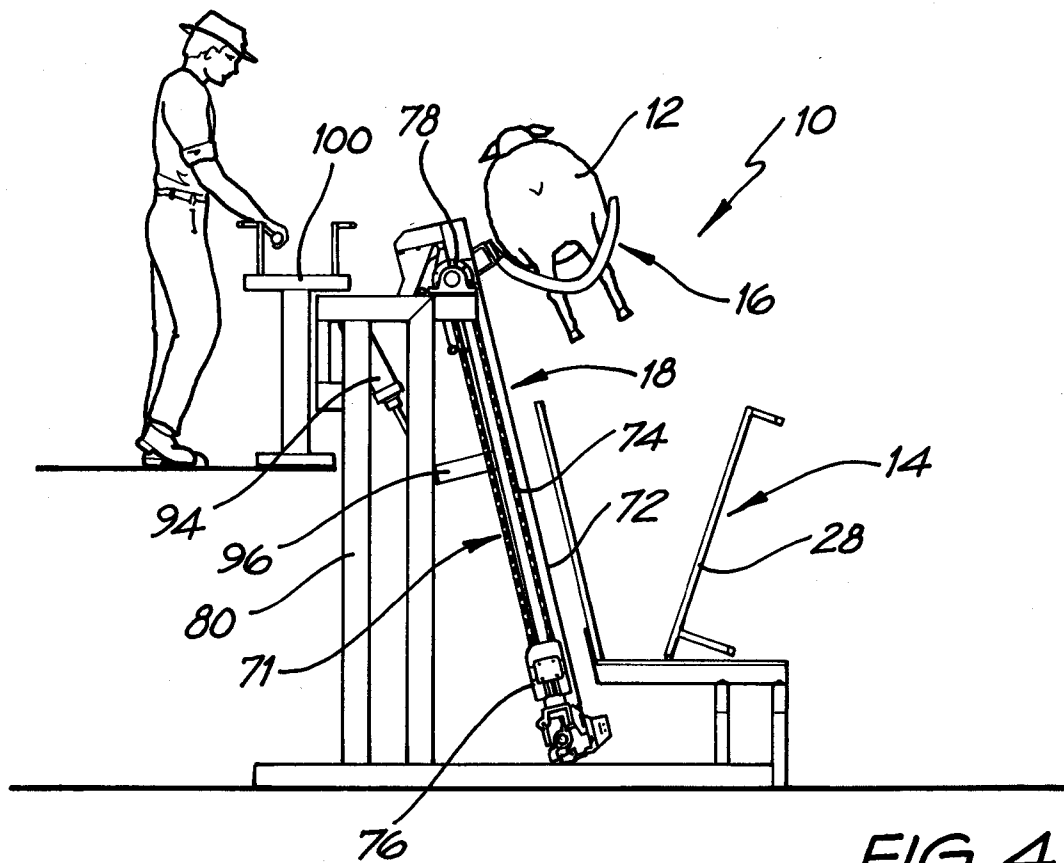


FIG. 4

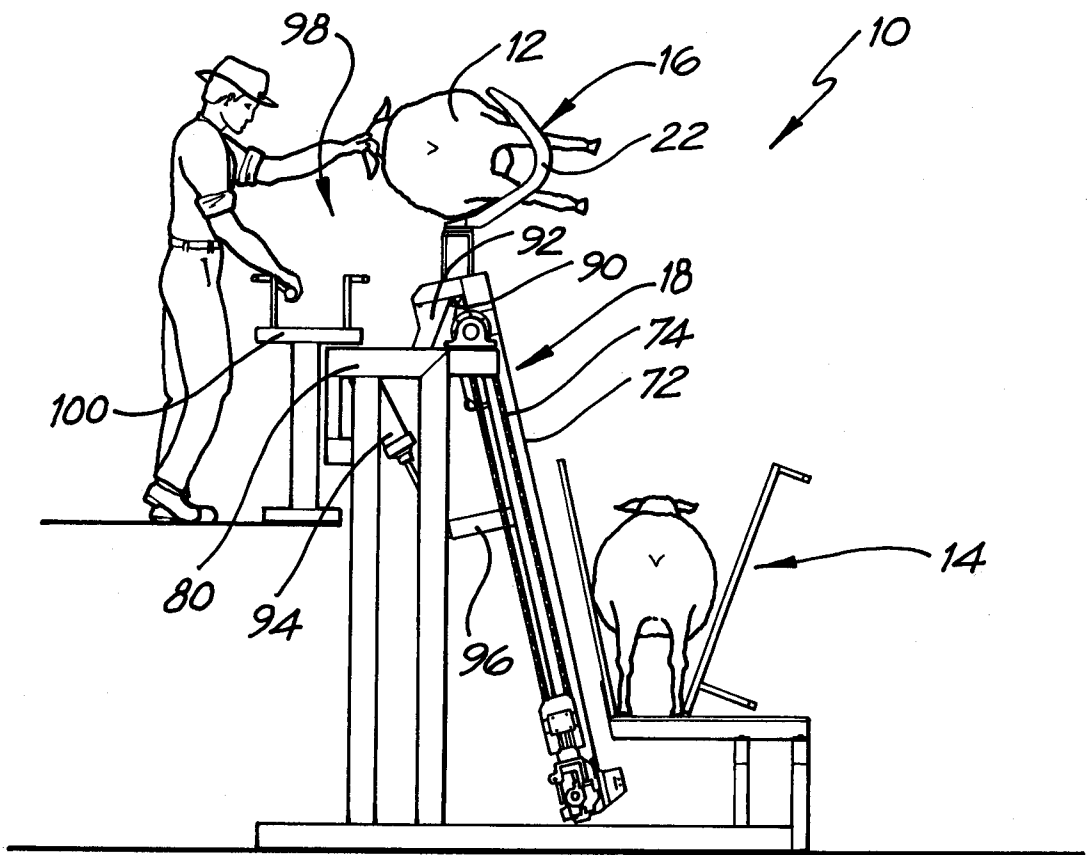


FIG. 5

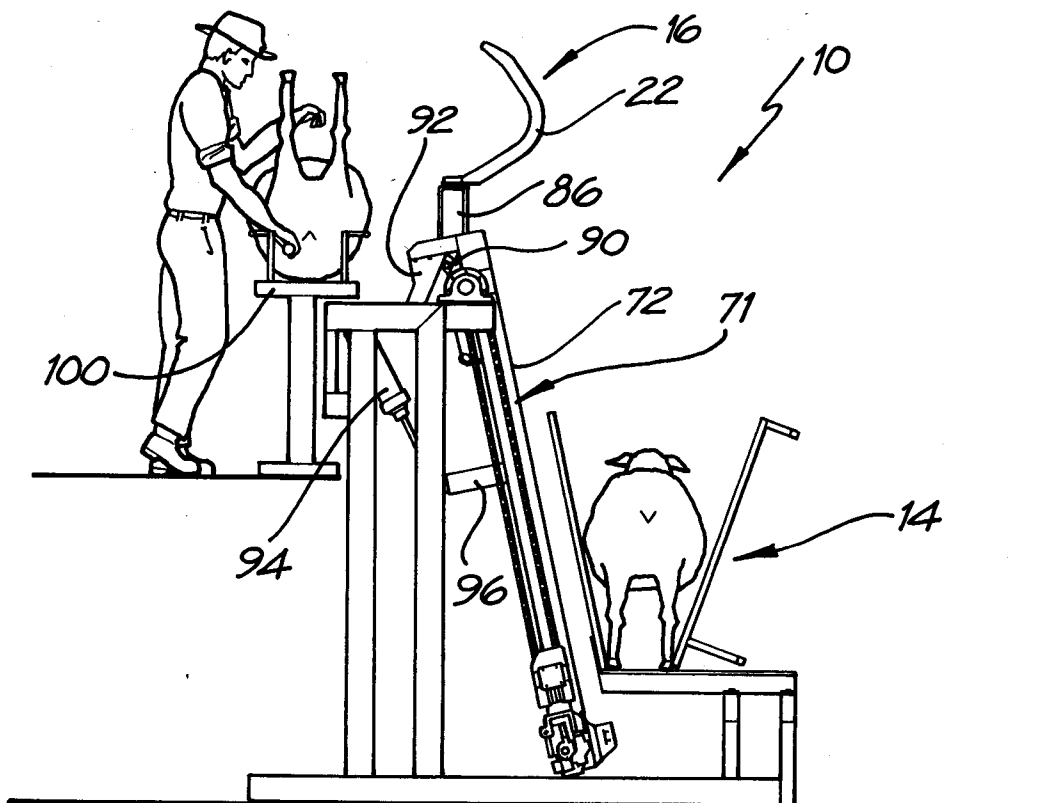


FIG. 6

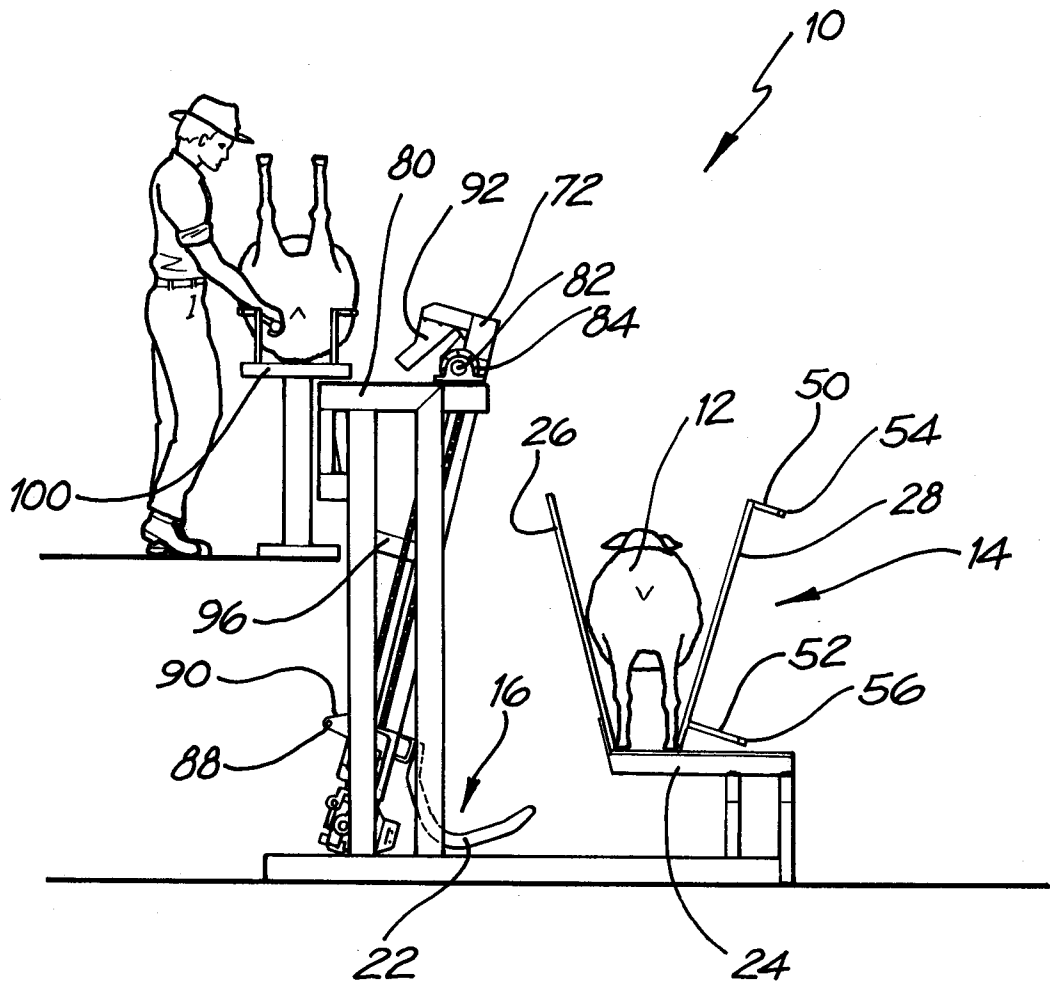


FIG. 7

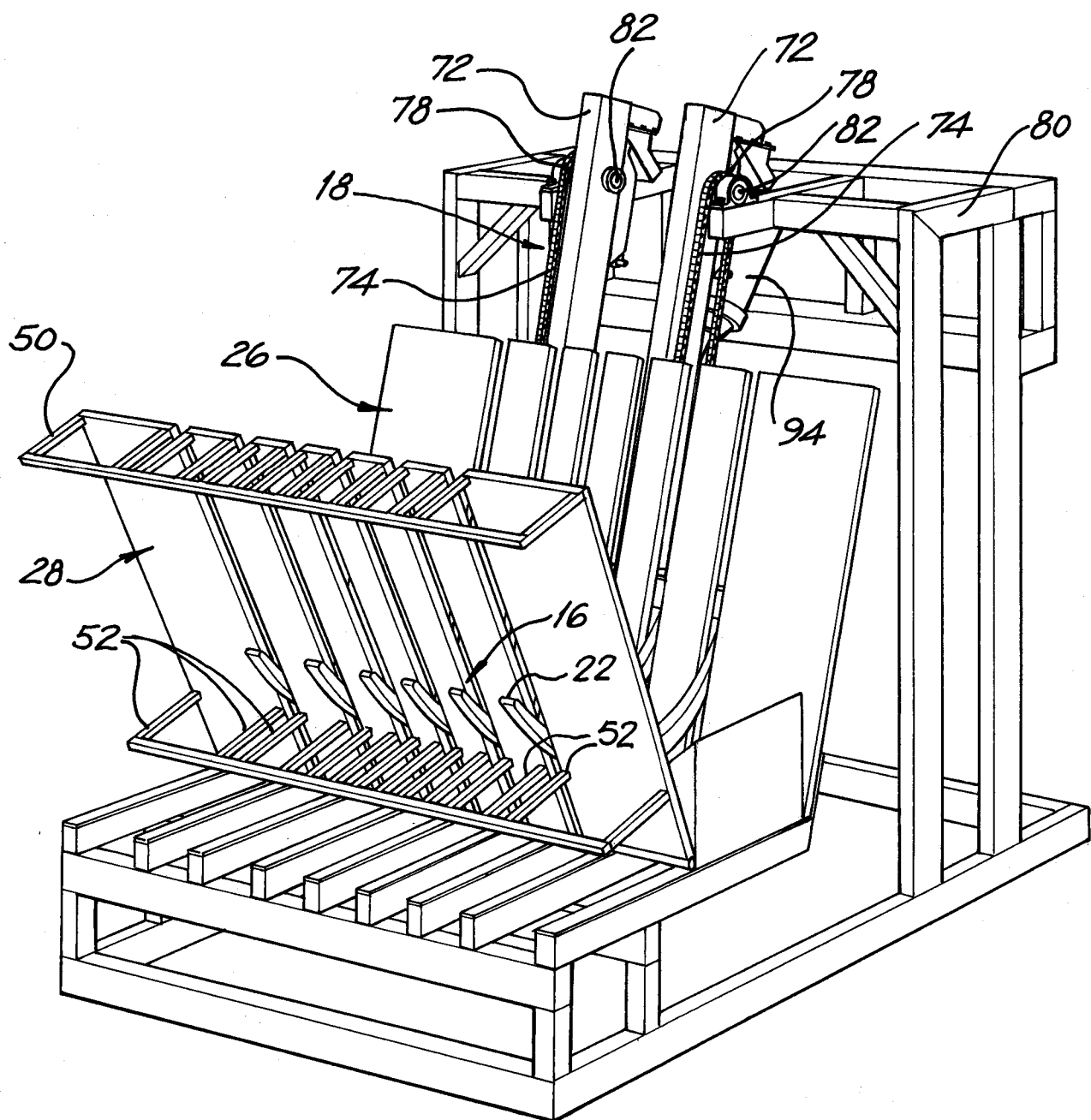


FIG. 8