Office de la Propriété Intellectuelle du Canada
Un organisme d'Industrie Canada

Canadian Intellectual Property Office
An agency of Industry Canada

CA 2418518 A1 2004/08/05

(21) 2 418 518

(12) DEMANDE DE BREVET CANADIEN
CANADIAN PATENT APPLICATION

(13) A1

(22) Date de dépôt/Filing Date: 2003/02/05

(41) Mise à la disp. pub./Open to Public Insp.: 2004/08/05

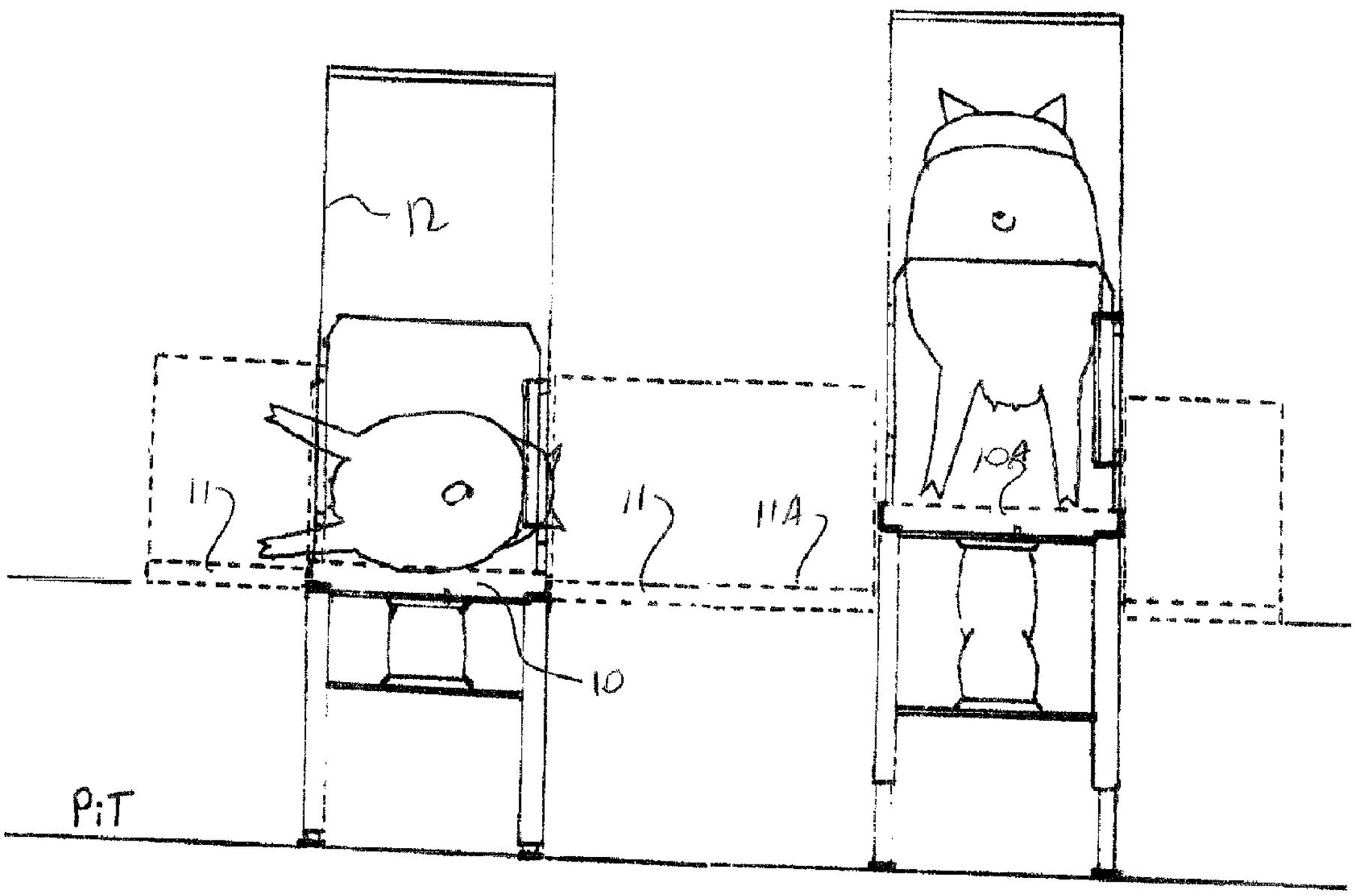
(51) Cl.Int.^{7}/Int.Cl.^{7} A01K 1/02

(71) Demandeurs/Applicants:
LARAMEE, GERALD E. J., CA;
FUNK, ROBERT, CA

(72) Inventeur/Inventor:
LARAMEE, GERALD E. J., CA

(74) Agent: ADE & COMPANY

(54) Titre : APPAREIL POUR L'ELEVAGE D'UNE TRUIE DANS UNE CAGE DE MISE-BAS
(54) Title: APPARATUS FOR RAISING A SOW IN A FARROWING CRATE



(57) Abrégé/Abstract:
In a farrowing pen which includes a pit and over the pit a first floor section on which the sow can stand and lie and two further floor sections on each side of the first floor section for receiving piglets of the sow and confining walls for locating the sow on the first floor section there is provided an apparatus for lifting the sow away from the piglets to prevent crushing. The apparatus includes a base on legs and a gas bag lift mechanism carried on the base above the manure and arranged to raise a plate carrying two parallel rails with the first floor section thereon. An air valve extends through the flooring and is operated by pressure from contact with the sow for actuating the controlling the flow of the air. The rate of lifting is faster than the rate of lowering. Extendible legs around the base support and guide the floor on the bag.

ABSTRACT

In a farrowing pen which includes a pit and over the pit a first floor section on which the sow can stand and lie and two further floor sections on each side of the first floor section for receiving piglets of the sow and confining walls for locating the sow on the first floor section there is provided an apparatus for lifting the sow away from the piglets to prevent crushing. The apparatus includes a base on legs and a gas bag lift mechanism carried on the base above the manure and arranged to raise a plate carrying two parallel rails with the first floor section thereon. An air valve extends through the flooring and is operated by pressure from contact with the sow for actuating the controlling the flow of the air. The rate of lifting is faster than the rate of lowering. Extendible legs around the base support and guide the floor on the bag.

APPARATUS FOR RAISING A SOW IN A FARROWING CRATE

This invention relates to an apparatus for raising a sow in a farrowing crate relative to a floor for the piglets for reducing piglet mortality by crushing as the sow lies or treads during movement to access feed and water.

BACKGROUND OF THE INVENTION

In British patent 932189 (Hodgkinson) issued in 1963 is shown a farrowing crate or pen for sows where the level of the outer floor section which carries the piglets can be raised and lowered in order to move the piglets away from danger from the sow when the sow is standing. Thus when the sow lies down, the piglets are kept away from the height of the floor level on which the sow lies to reduce the possibility of crushing.

This arrangement uses a light beam and electric switches to detect the movement of the sow and uses a complex lifting arrangement. Neither of these is satisfactory and the device is currently not available on the market.

U.S. Patent 4,793,287 of Hoffmann issued in 1988 discloses a modified arrangement in which lifting and lowering of the piglet floor section is actuated by an alternative arrangement. However again this construction is disadvantageous and is not available in the market place.

SUMMARY OF THE INVENTION

It is one object of the present invention, therefore, to provide an improved apparatus for raising and lowering a sow in a farrowing pen.

According to one aspect of the invention there is provided an apparatus for raising a sow in a farrowing pen where the farrowing pen includes a

first floor section on which the sow can stand and lie, a second floor section on at least one side of the first floor section for receiving piglets of the sow and confining walls for locating the sow on the first floor section; the apparatus comprising:

a support for carrying the first floor section;

a base member on which the support is mounted;

an air operated lift mechanism carried on the base member and arranged to raise the support with the first floor section thereon when air is supplied to the lift mechanism and arranged to lower the support with the first floor section thereon when air is discharged from the lift mechanism;

and a valve operable by pressure from contact with the sow for actuating the controlling the flow of the air.

Preferably the valve is arranged at the floor for pressure on the valve when the sow is lying.

Preferably the valve includes a valve actuator which is covered by a cover plate on to which the sow can lie.

Preferably the cover plate is a channel resting along floor bars of the first floor section.

Preferably the lift mechanism comprises an air bag.

Preferably support includes a plurality of extendible legs with the lift mechanism arranged lift the support thus causing the legs to extend.

Preferably the floor sections are arranged above a manure pit, wherein the legs extend from a bottom of the pit to the support and wherein the base member is carried on legs so as to support the lift mechanism above the manure.

Preferably the legs are at spaced positions around the base member.

Preferably the support comprises a pair of side rails for supporting floor panels of the first floor section the side rails being carried on a support plate on top of the lift mechanism.

Preferably the support plate on top of the lift mechanism extends across the width of the floor and only partly along the length of the rails.

Preferably the lift mechanism is arranged such that the time for lowering of the first floor section from a raised position to a position coplanar with the second floor section is longer than the time for raising.

Preferably there is provided a manually operable switch for controlling the lift mechanism by which the first floor section can be lowered for release of the sow and by which the first floor section can be raised to maintain the piglets in the second floor section for catching.

According to a second aspect of the invention there is provided an apparatus for raising a sow in a farrowing pen where the farrowing pen includes a manure pit, a first floor section over the pit on which the sow can stand and lie, a second floor section over the pit on at least one side of the first floor section for receiving piglets of the sow and confining walls for locating the sow on the first floor section; the apparatus comprising:

a support for carrying the first floor section;

a base member on which the support is mounted;

a lift mechanism carried on the base member and arranged to raise and lower the support with the first floor section thereon;

the base member having a plurality of legs supporting the lift mechanism above the bottom of the pit and out of the manure;

and a plurality of extendible legs at spaced positions around the base member extending from a bottom of the pit to the support.

According to a third aspect of the invention there is provided an apparatus for raising a sow in a farrowing pen where the farrowing pen includes a first floor section on which the sow can stand and lie, a second floor section on at least one side of the first floor section for receiving piglets of the sow and confining walls for locating the sow on the first floor section; the apparatus comprising:

a support for carrying the first floor section;

a base member on which the support is mounted;

a lift mechanism carried on the base member and arranged to raise and lower the support with the first floor section thereon;

and a switch operable by pressure from contact with the sow for actuating the lift mechanism, the switch being arranged at the floor for pressure on the switch when the sow is lying.

BRIEF DESCRIPTION OF THE DRAWINGS

One embodiment of the invention will now be described in conjunction with the accompanying drawings in which:

Figure 1 is a side elevational view through a farrowing pen showing the lifting apparatus according to the present invention.

Figure 2 is a rear elevational view of the farrowing pen of Figure 1.

Figure 3 is a rear elevational view similar to that of Figure 2 on an enlarged scale.

Figure 4 is a top plan view of a portion only of the farrowing pen of Figure 1.

Figure 5 is a cross sectional view along the lines 5-5 of Figure 4.

In the drawings like characters of reference indicate corresponding parts in the different figures.

DETAILED DESCRIPTION

In Figures 1 and 2 is shown the construction of the present invention somewhat schematically showing the operation of the device and the basic construction of the device.

A farrowing crate thus comprises a first floor section 10 for receiving the sow. The floor section 10 can be formed from many different types of flooring all of which are presently commercially available including plastics flooring, cast iron flooring and flooring of plastics coated metal. The floor section has a width and length sufficient to receive the sow and is in some cases formed from panels which are arranged end to end to form the complete floor section. On each side of the first floor section is provided to second floor sections 11 which are arranged for receiving the piglets. The characteristics of the floor therefore are significantly different and they include heating pads and the like to properly provide the required situation for the piglets including the required ambient temperature.

The second floor sections 11 are arranged so that a next adjacent farrowing pen provides an adjacent floor section 11A with a further floor section 10A for the next adjacent sow.

Each first floor section 10 includes a crate 12 providing confining walls which locate the sow front and back and side to side so that the sow is maintained in the area on top of the floor and is prevented from moving to the sides into the area of the floor section 11 or out of the pen in front to rear direction. The walls are shown only schematically since these are well known to one skilled in the art and the construction can vary depending upon the particular manufacture of the farrowing crate. A feeder 13 is provided on a front wall 13A for providing feed and water to the sow when required. In order to take the feed and water, the sow stands on the floor section 10 to feed voluntarily and then to lie down when feeding is complete.

The floor sections 10 and 11 are arranged over a pit 14 having a pit floor 15 onto which manure collects from the pens by passing through the flooring which is suitably perforated. The depth of the pit is generally of the order of 18 to 24 inches which allows manure to collect in the bottom of the pit up to a depth of no more than 9 to 15 inches for collection through a collection system.

The floor section 10 is carried on a pair of side rails 16 each forming an angle iron with a horizontal base flange and upstanding vertical flange at the outside edge of the rail. Thus the angle irons provide a top face 17 onto which the flooring rests so that it spans across the parallel rails 16 and extends along the length of the rails and outwardly beyond ends 18 of the rails to the front and rear of the pen. Different types of flooring rest upon the angle irons 16 in a different manner as

required by the construction of the flooring and some includes lips which engage over the edges 17 and others sit within the edges 17 on the horizontal portion of the angle irons.

The angle irons are carried on a plate 20 which spans across the width of the floor section 10 and extends along a part of the length of the angle iron 16. The angle irons are bolted to the plate or may be welded to the plate along the side edges of the plate with the plate having sufficient length to provide support for the angle irons to prevent bending, twisting or tilting.

The plate 20 is thus generally square and has at its four corners each of four legs 21 which extend from the plate downwardly to the bottom surface 15 of the pit. The legs 21 include an outer tube 22 and an inner tube 23 allowing the legs to be extendable as guides by the sliding movement of the tubes. Thus the inner tube 23 sits on the bottom of the pit and the outer tube 22 is welded to the bottom of the plate. The legs thus act as guides and also act as a bottom stop providing a minimum height of the floor section 10 when it is lowered toward the pit. At that minimum height the floor section 10 is at the same height as the floor section 11 as shown at the left in Figure 2.

Inside the legs 21 is provided a base member 25 including a top plate 26 and four supporting legs 27. Thus the legs 21 are arranged around the outside of the base 25 at spaced positions.

Between the top plate 26 of the base and the plate 20 is provided an inflatable gas bag 30. Such gas bags are commercially available and are conventionally used in truck suspension systems but many different types of such

bags having different inflation and expansion parameters are available from commercial suppliers.

A commercially available valve 31 is provided which can be operated to control air from an air supply 32 to a regulator valve 34 through a line 33 and from the valve 31 into the gas bag 30. The valve is normally maintained closed so that the bag is uninflated. The valve 31 includes an actuator which projects upwardly as a stud or button 35 extending through the slot between two of the rails 10B of the floor section 10. In some cases it is necessary to cut out a part or one of the rails or one of the parts of the flooring so as to allow the actuator pin to project through the floor into a position above the height of the flooring.

The pin is covered by a channel member which sits on top of the pin and thus provides an elongate plate 37 sitting on top of the floor section 10 slightly raised from the floor. The plate has one end 38 resting on the floor and the pin holds the other end upwardly from the floor so that the plate can be pushed down toward the floor by pressure from the sow. Thus the valve actuator pin 35 is directly actuated by pressure from the sow and the channel provides an increased area over which the pressure from the sow can be applied causing the actuation of the valve. The channel 37 has depending side walls 39 which project between the rails 10B of the flooring to hold the plate in place. The plate may be attached to the top of the pin so that it cannot slide forwards and rearwards under forces from the sow.

The positioning of the plate is such that it is under the chest area of the sow so as to provide effective contact when the sow lies down.

The valve 31 thus can be operated by release of pressure caused by the animal tending to stand to allow the supply of air from the supply 32 into the gas bag 30 expanding the gas bag and causing the support for the floor to move upwardly to the maximum height. This movement is effected relatively quickly so that the sow is lifted away from the flooring 11 to the raised height while deterring any piglets from entering onto the flooring 10 to be raised therewith.

As shown in Figure 3, on each side is provided a panel 40 alongside the legs 21 so as to close off the area on either side of the floor to prevent the piglets from entering into the area underneath the floor 10.

When the sow lies down, this applies pressure onto the plate 37 actuating the valve so as to close off supply of air from a supply 32 and acting to release the air from the gas bag through a discharge orifice. The discharge is arranged so that the floor 10 moves relatively slowly in the downward direction so that the sow is given time to lie down before the floor reaches the lowered position at the height of the floor 11.

The device is thus arranged to save piglets from the first second of birth to the day they get weaned. This unit works on air only. The unit is arranged to be installed beneath the sows floor only, in existing barns in new barn construction. Every farrowing barn operation will benefit from this invention.

Even if the sow only sits up, the actuator valve on this unit will be activated and it only takes approximately nine seconds for the sows to raise up to twelve inches. This does not give the piglets enough time to get beneath the sow if she decides to lay down again. Once the sow is standing the unit is fully raised, her

piglets are now confined only on the tender foot so she can eat and drink the sufficient amount she needs to conserve her body fat. If the sows eat well this means they will also milk well and that is what is required to wean big, nice healthy pigs. The time it takes for this unit to retract after the sow lays down again is approximately twenty seconds. This is sufficient time for most sows to have laid on their side again and by not having any piglets in her way the amount of laid-on and stepped-on pigs will be reduced tremendously.

This unit will also give that extra time for the low viability piglets to gain strength which normally they fall over beneath the sow while she is standing and get crushed by her because they are not strong enough to get out of her way. This unit is a low cost and low maintenance device for what it is capable of saving. Pre-weaning mortality will decrease and pigs weaned per mated female per year will increase. At weaning time the advantage of this unit is having a shut off valve in your farrowing room which means the sows will get out of the crates as normal. When comes time to pick up the weanlings, one valve that supplies the air in that room can be operated and this means all your weanlings in each of these pens are confined to their storage space, this way it becomes one third of the area to catch them. This unit is efficient by itself and also efficient for the work load for hog producers.

Since various modifications can be made in my invention as herein above described, and many apparently widely different embodiments of same made within the spirit and scope of the claims without departing from such spirit and

scope, it is intended that all matter contained in the accompanying specification shall be interpreted as illustrative only and not in a limiting sense.

CLAIMS:

1. Apparatus for raising a sow in a farrowing pen where the farrowing pen includes a first floor section on which the sow can stand and lie, a second floor section on at least one side of the first floor section for receiving piglets of the sow and confining walls for locating the sow on the first floor section; the apparatus comprising:

a support for carrying the first floor section;

a base member on which the support is mounted;

a air operated lift mechanism carried on the base member and arranged to raise the support with the first floor section thereon when air is supplied to the lift mechanism and arranged to lower the support with the first floor section thereon when air is discharged from the lift mechanism;

and a valve operable by pressure from contact with the sow for actuating the controlling the flow of the air.

2. The apparatus according to Claim 1 wherein the valve is arranged at the floor for pressure on the valve when the sow is lying.

3. The apparatus according to Claim 2 wherein the valve includes a valve actuator which is covered by a cover plate on to which the sow can lie.

4. The apparatus according to Claim 3 wherein the cover plate is a channel resting along floor bars of the first floor section.

5. The apparatus according to any one of Claims 1 to 4 wherein the lift mechanism comprises an air bag.

6. The apparatus according to any one of Claims 1 to 5 wherein support includes a plurality of extendible legs with the lift mechanism arranged lift the support thus causing the legs to extend.

7. The apparatus according to Claim 6 wherein the floor sections are arranged above a manure pit, wherein the legs extend from a bottom of the pit to the support and wherein the base member is carried on legs so as to support the lift mechanism above the manure.

8. The apparatus according to Claim 6 or 7 wherein the legs are at spaced positions around the base member.

9. The apparatus according to any one of Claims 1 to 8 wherein the support comprises a pair of side rails for supporting floor panels of the first floor section the side rails being carried on a support plate on top of the lift mechanism.

10. The apparatus according to Claim 9 wherein the support plate on top of the lift mechanism extends across the width of the floor and only partly along the length of the rails.

11. The apparatus according to any one of Claims 1 to 10 wherein the lift mechanism is arranged such that the time for lowering of the first floor section from a raised position to a position coplanar with the second floor section is longer than the time for raising.

12. The apparatus according to any one of Claims 1 to 11 wherein there is provided a manually operable switch for controlling the lift mechanism by which the first floor section can be lowered for release of the sow and by which the

first floor section can be raised to maintain the piglets in the second floor section for catching.

13. Apparatus for raising a sow in a farrowing pen where the farrowing pen includes a manure pit, a first floor section over the pit on which the sow can stand and lie, a second floor section over the pit on at least one side of the first floor section for receiving piglets of the sow and confining walls for locating the sow on the first floor section; the apparatus comprising:

a support for carrying the first floor section;

a base member on which the support is mounted;

a lift mechanism carried on the base member and arranged to raise and lower the support with the first floor section thereon;

the base member having a plurality of legs supporting the lift mechanism above the bottom of the pit and out of the manure;

and a plurality of extendible legs at spaced positions around the base member extending from a bottom of the pit to the support.

14. The apparatus according to Claim 13 wherein the support comprises a pair of side rails for supporting floor panels of the first floor section the side rails being carried on a support plate on top of the lift mechanism.

15. The apparatus according to Claim 13 or 14 wherein the support plate on top of the lift mechanism extends across the width of the floor and only partly along the length of the rails.

16. The apparatus according to Claim 13, 14 or 15 wherein the lift mechanism comprises an air bag.

17. Apparatus for raising a sow in a farrowing pen where the farrowing pen includes a first floor section on which the sow can stand and lie, a second floor section on at least one side of the first floor section for receiving piglets of the sow and confining walls for locating the sow on the first floor section; the apparatus comprising:

a support for carrying the first floor section;

a base member on which the support is mounted;

a lift mechanism carried on the base member and arranged to raise and lower the support with the first floor section thereon;

and a switch operable by pressure from contact with the sow for actuating the lift mechanism, the switch being arranged at the floor for pressure on the switch when the sow is lying.

18. The apparatus according to Claim 17 wherein the valve includes a valve actuator which is covered by a cover plate on to which the sow can lie.

19. The apparatus according to Claim 18 wherein the cover plate is a channel resting along floor bars of the first floor section.

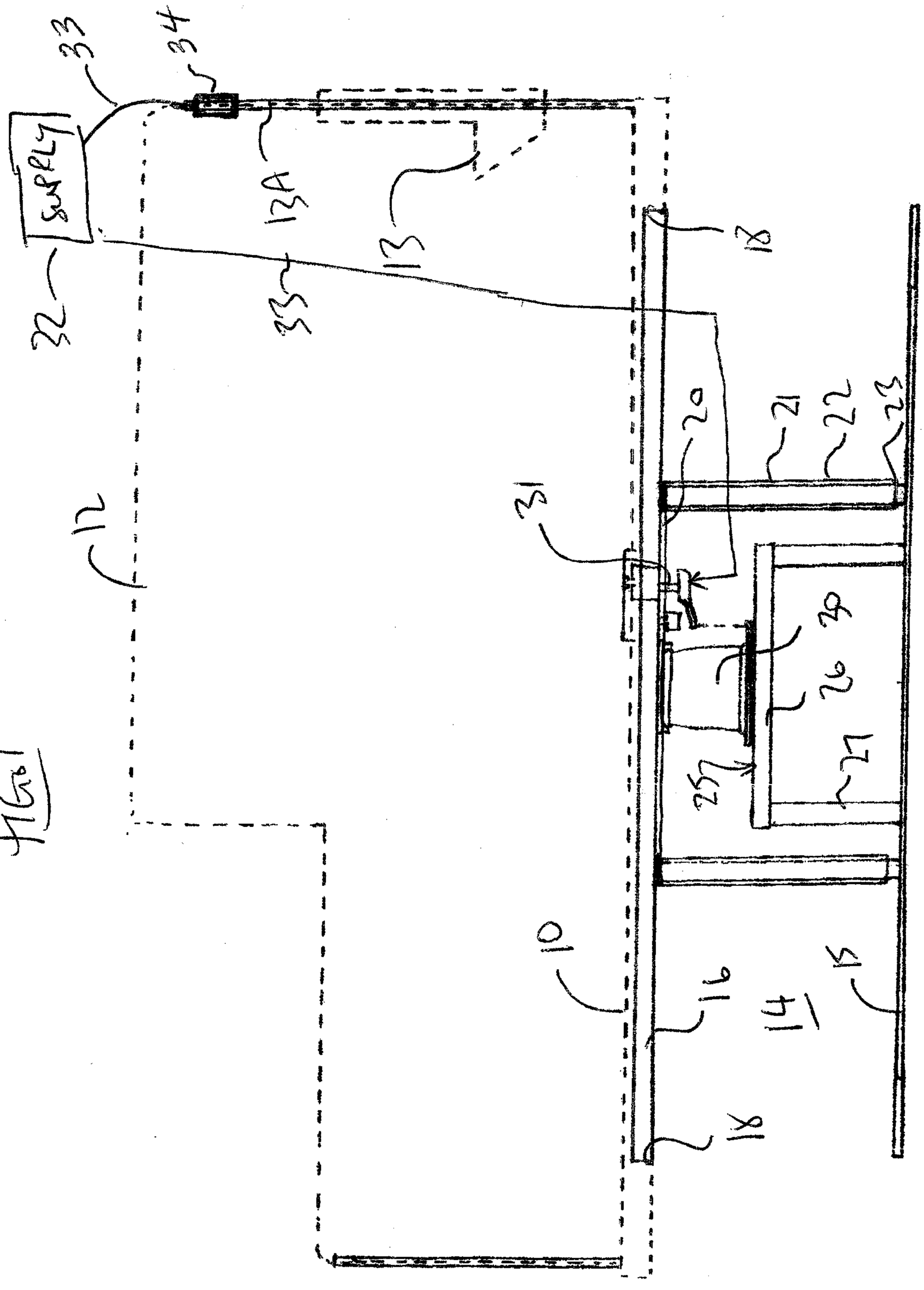


Fig. 1

INVENTOR:
GERALD E. J. LARAMEE
PER:
ADE & COMPANY

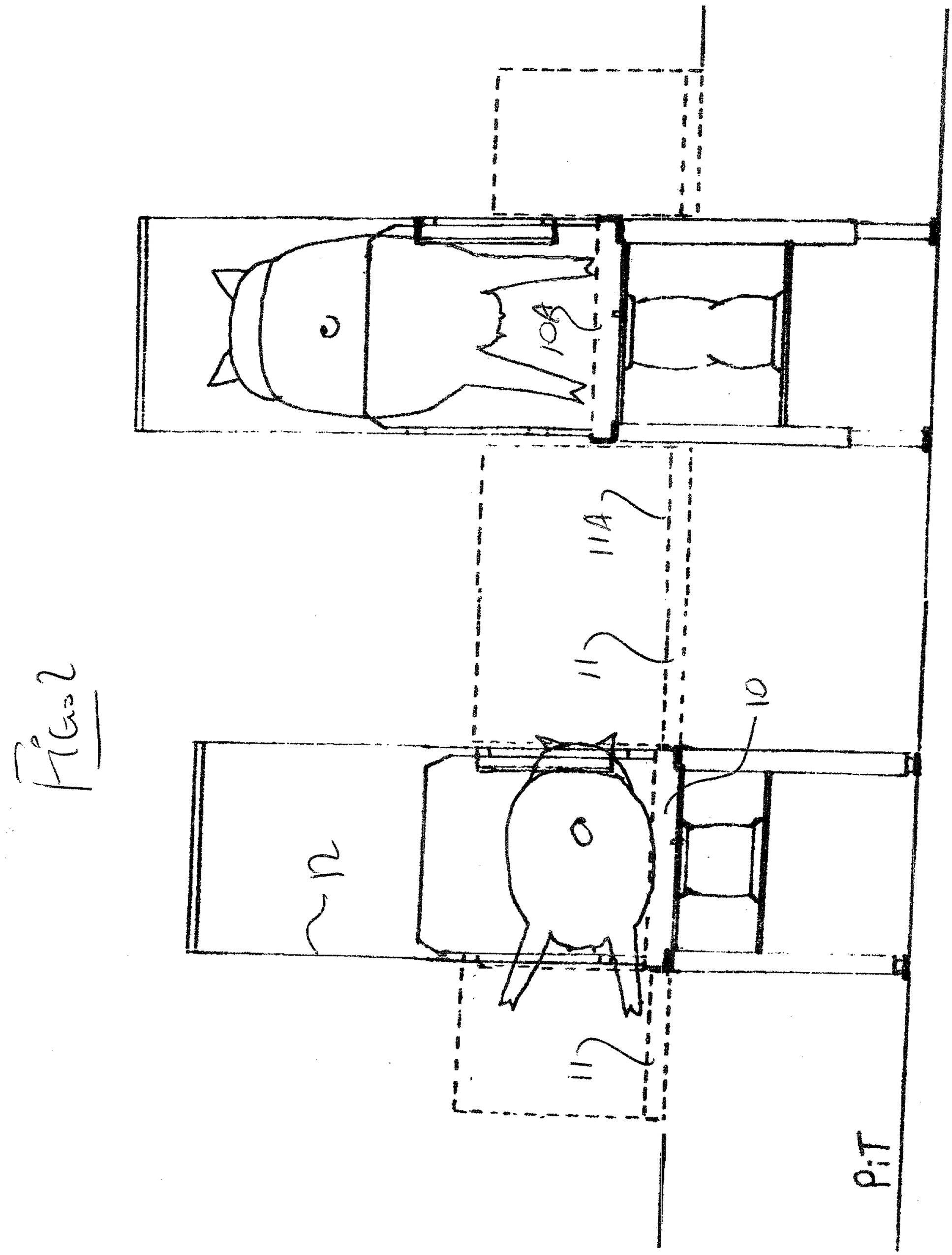


Fig 2

INVENTOR:
GERALD E. J. LARAMEE
PER:
ADE & COMPANY

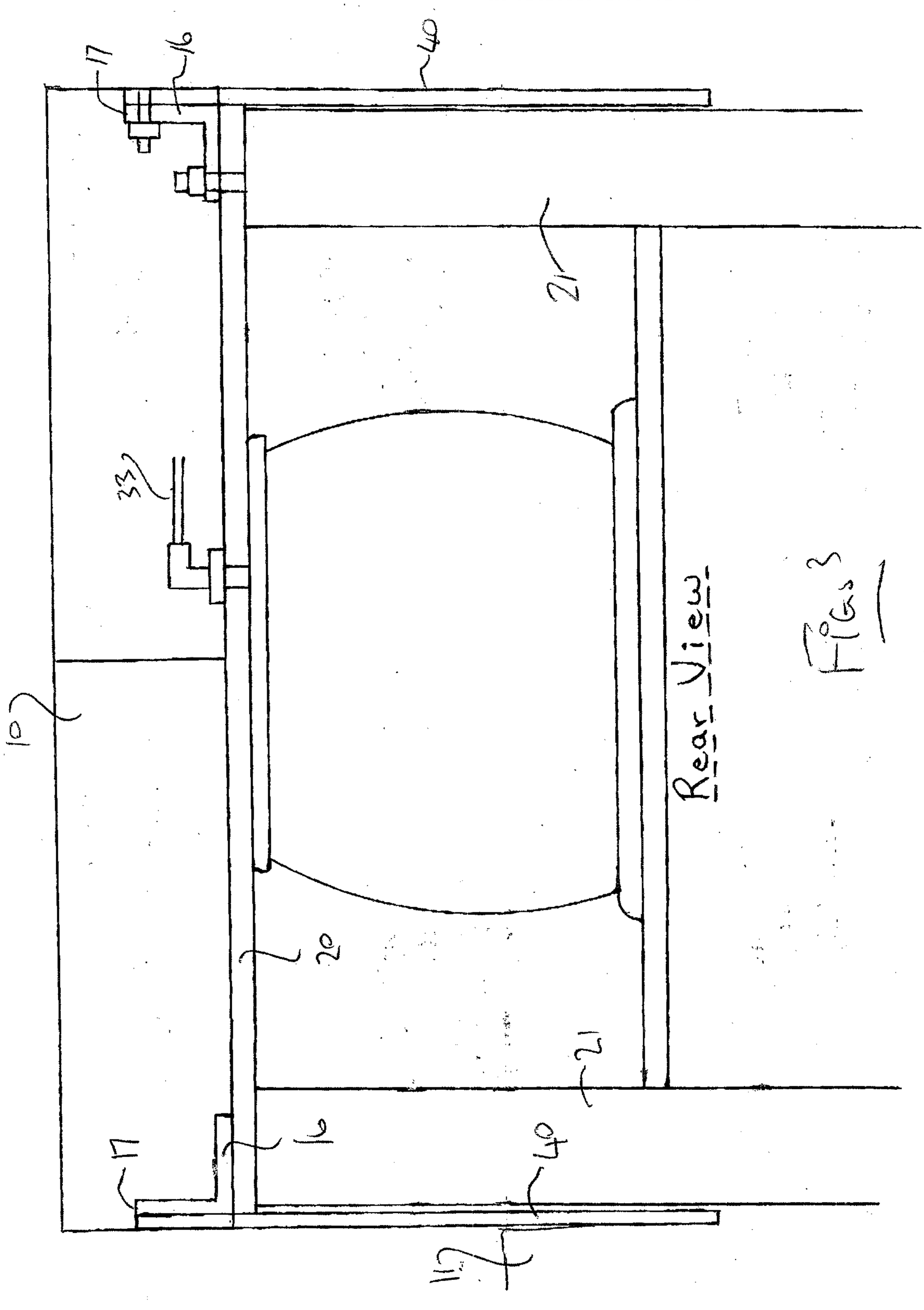
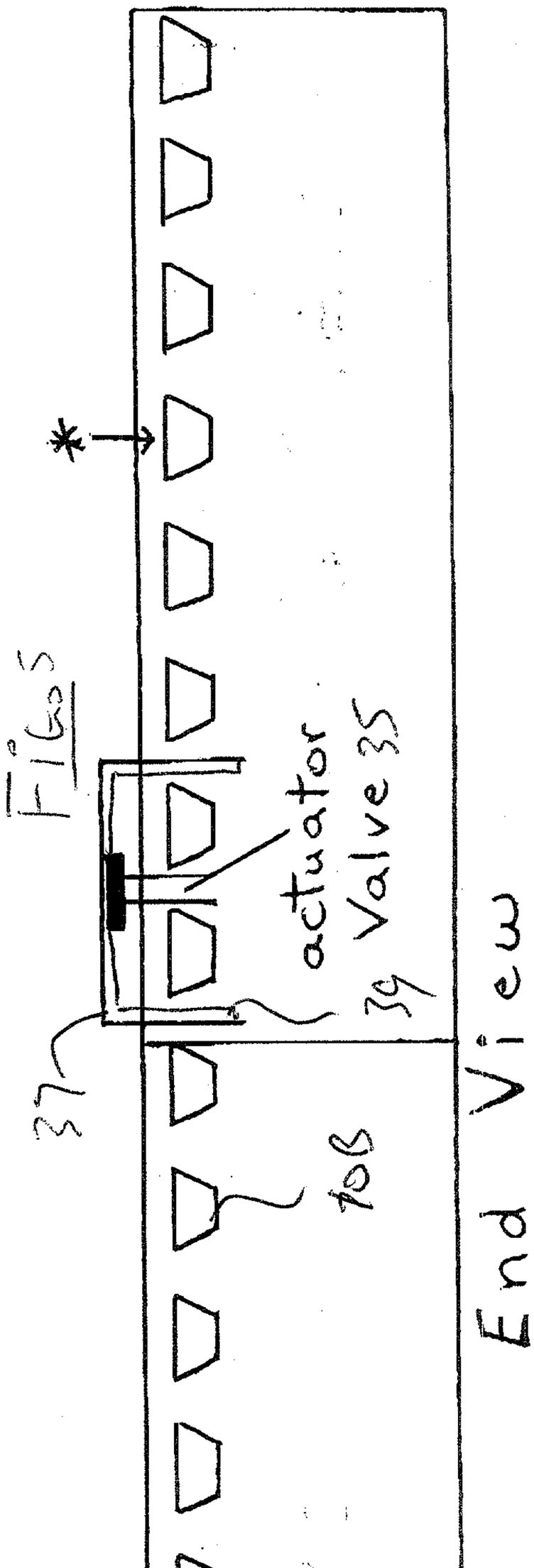
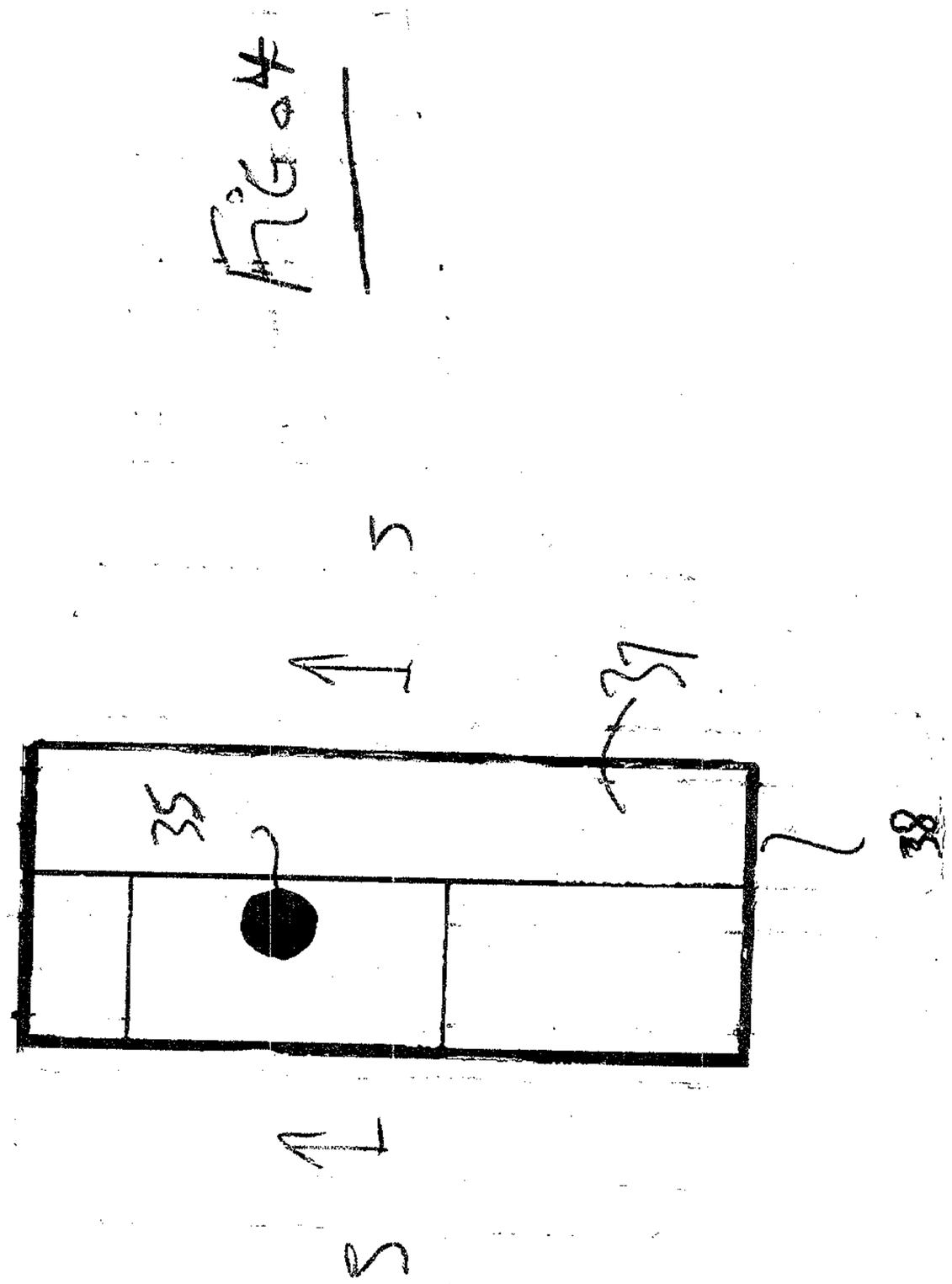


FIG 1

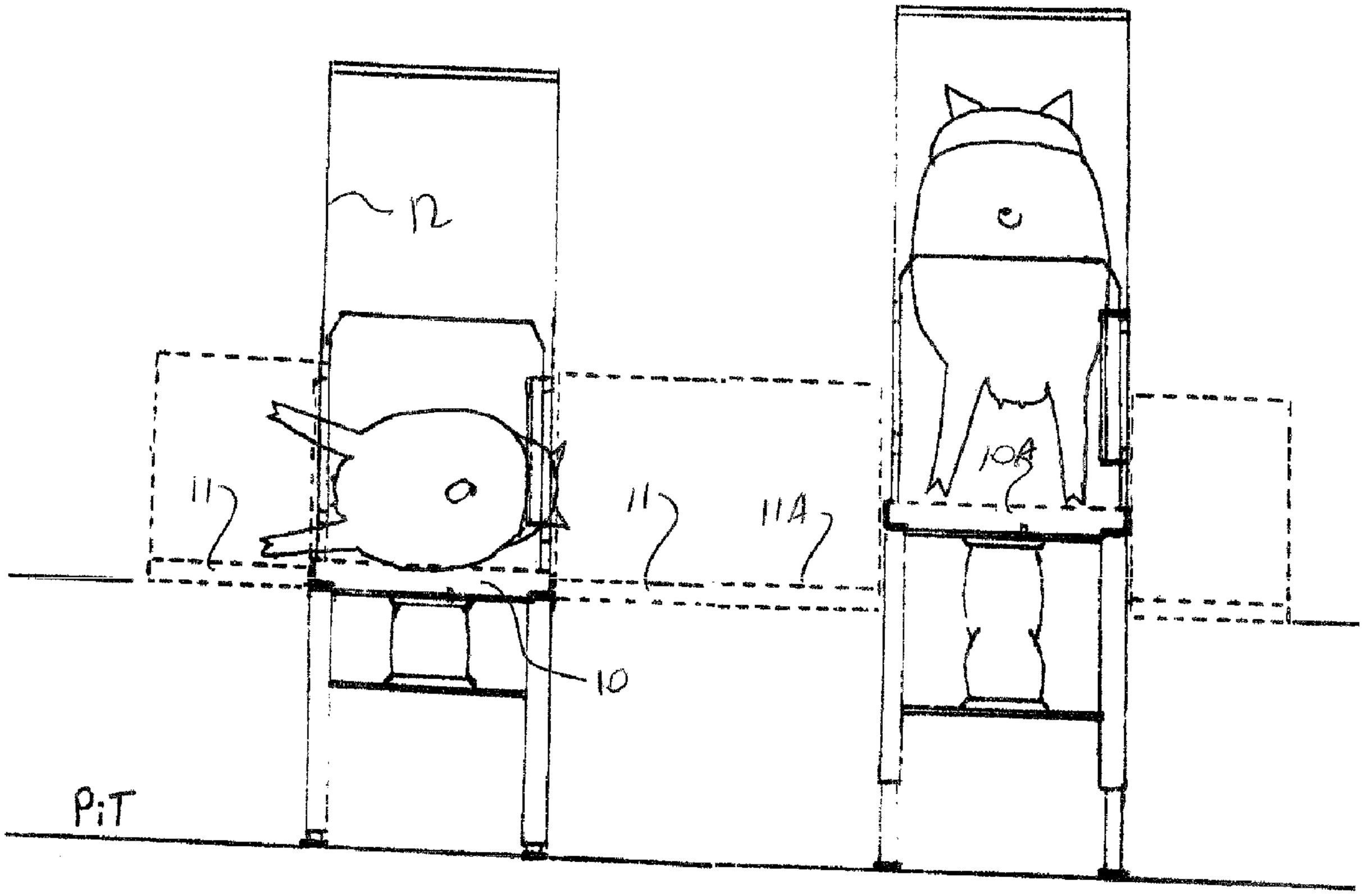
INVENTOR:
GERALD E. J. LARAMEE

PER:
ADE & COMPANY





INVENTOR:
GERALD E. J. LARAMEE
PER:
ADE & COMPANY


12
11
10
11
11A
10A
PIT