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"An animal drafting system"

The present invention relates to an animal drafting system.

- 5 Animal drafting systems are used for diverting one or more animals passing therethrough into one or more holding areas typically, for carrying out tests or investigations on the animal or for treating an animal. Typically, drafting systems may be provided at the exit from a milking parlour to divert an animal into a holding area where the animal, during milking, was detected as requiring further
- 10 investigation or treatment, for example, from mastitis or other conditions which may be detected during the milking of the animal.

- In general, such drafting systems comprise an elongated framework which defines an elongated animal accommodating passageway extending therethrough from an
- 15 upstream end, which defines an entrance to the passageway, to a downstream end which defines at least two exits, a first one of the exits, which typically, is centrally aligned with the passageway to allow an animal to pass directly from the passageway unimpeded, and a second exit typically, to one side of the passageway which diverts an animal into a holding area for holding the animal. Many such
- 20 animal drafting systems comprise three downstream exits, one of which is a central exit centrally aligned with the passageway, and the other two of which are side exits located on respective opposite sides of the passageway adjacent the central exit, which divert an animal into either one of respective holding areas located on opposite sides of the passageway.

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In general, in such animal drafting systems which comprise only two exits, namely,

one central exit aligned with the passageway, and a side exit to one side of the passageway, a drafting element, typically, a drafting gate is hingedly coupled to the framework between the two exits about a vertically extending hinge axis, and extends in a general upstream direction from the hinge axis. The drafting gate is hingeable about the hinge axis between a first state extending substantially parallel to the passageway permitting egress from the passageway through the central exit and preventing egress from the passageway through the side exit, and a second state preventing egress through the central exit and permitting egress from the passageway through the side exit.

In animal drafting systems which comprise three exits, one of which exit is a central exit aligned with the passageway at the downstream end thereof, and two of which exits are side exits located on respective opposite sides of the passageway adjacent the downstream end thereof, two drafting elements, typically, two drafting gates are provided. One of the drafting gates is hingedly coupled to the framework on one side of the passageway, and typically, between the central exit and one of the side exits. The other drafting gate is hingedly coupled to the framework on the opposite side of the passageway, and typically, between the central exit and that other side exit. The two drafting gates are hingeable about the respective hinge axes between respective first and second states, such that when both of the drafting gates are in the first state, egress from the passageway is prevented through the respective side exits, and egress from the passageway through the central exit is permitted. When one of the drafting gates is in the first state and the other one of the drafting gates is in the second state, egress from the passageway is permitted through the side exit corresponding to the drafting gate in the second state, and egress from the passageway is prevented through the other side exit and through the central exit.

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A problem arises in such animal drafting systems when an animal is slow in exiting the passageway through the exit, through which egress is permitted. In which case the relevant drafting gate or gates may be operated from the relevant one of the first and second states to the other of the first and second states prior to the animal having fully passed through the relevant exit. In such cases, the free end of the relevant drafting gate may catch the animal as the animal is still in the exit, or may catch one of the hind legs of the animal before the animal has fully exited the relevant exit, thus leading to possible injury of the animal. Another problem which may arise with some animals that have been drafted before, and the animal associates being drafted with an unpleasant experience, that animal, on detecting commencement of movement of a drafting gate to draft the animal, may make an attempt to run directly through the passageway, in order to avoid being drafted, and as a result may run directly into the free end of the drafting gate, resulting in injury to the animal. This is undesirable.

Additionally, such animal drafting systems may also comprise one or a pair of closure elements, typically closure gates adjacent the upstream entrance to the passageway, which are operable between an open state for permitting access to the passageway, and a closed state for preventing access to the passageway. Such closure gates are pivotally coupled to the framework and are pivotal between the open and closed states. A similar problem arises with such closure gates as arise with drafting gates, in that if the animal is slow passing through the entrance to the passageway, the closure gate or gates may be urged into the closed state while an animal is still in the entrance, thus resulting in the closure gate or gates catching the animal or one of the hind legs of the animal, thereby resulting in injury to the animal.

This is undesirable.

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Additionally, such animal drafting systems may also comprise a drafting section only in which the drafting gates are located, or such animal drafting systems may

5 comprise a drafting section and a holding section which is upstream of the drafting section. Typically, an RFID communications system is located adjacent the holding section for communicating with an RFID tag or device attached to the animal for reading data indicative of the identity of the animal from the RFID tag or device, and also for reading other data relating to characteristics of the animal, such as feeding,

10 drinking and activity patterns and health parameters of the animal monitored by the tag or device since they were last read from the tag or device. In general, an animal is held in the passageway of the holding section until the identity of the animal is determined by the RFID system, and relevant data is read from the RFID tag or device. Additionally, the animal may be held in the passageway while the animal is

15 being weighed, its teats are being sprayed or the animal is being sprayed.

In such animal drafting systems one or a pair of intermediate closure elements, typically, intermediate closure gates are located in the passageway intermediate the entrance and the exits and between the holding section and the drafting section, for

20 holding an animal in the passageway in the holding section prior to permitting the animal to pass into the drafting section of the passageway. As with the drafting gates and closure gates adjacent the entrance to the passageway, the intermediate gates may close on an animal who is passing slowly through the intermediate gates before the animal has fully passed through the intermediate gates. This, can

25 likewise result in injury to the animal. This is undesirable.

There is therefore a need for an animal drafting system which minimises the risk of injury to an animal as the animal is passing therethrough.

The present invention is directed towards a drafting system which addresses this  
5 problem.

According to the invention there is provided an animal drafting system comprising a framework defining an animal accommodating passageway extending therethrough from an upstream end defining an animal accommodating entrance to the  
10 passageway and terminating in a downstream end, the downstream end defining at least an animal accommodating first exit from the passageway and an animal accommodating second exit from the passageway, at least one drafting element hingedly coupled to the framework about a hinge axis, and being hingeable about the hinge axis between a first state permitting egress from the passageway through  
15 the first exit and preventing egress from the passageway through the second exit, and a second state preventing egress from the passageway through the first exit, and permitting egress from the passageway through the second exit, the drafting element extending from the hinge axis to a free end thereof, and an elongated resiliently deformable first cushioning member extending along and outwardly from  
20 the free end of the drafting element and defining an elongated bore extending therethrough.

Preferably, the first exit defines a first exit opening for accommodating an animal therethrough, the first exit opening defining a plane extending substantially  
25 transversely of the passageway.

In one embodiment of the invention the first exit is longitudinally aligned with the passageway. Preferably, the passageway terminates in the first exit.

In another embodiment of the invention the second exit is located to one side of the  
5 passageway.

In another embodiment of the invention the drafting element is hingedly coupled to the framework adjacent the side of the passageway from which the second exit is located. Preferably, the drafting element is hingedly coupled to the framework  
10 adjacent the downstream end thereof. Advantageously, the drafting element is hingedly coupled to the framework between the first and second exits.

In another embodiment of the invention an animal accommodating third exit from the passageway is located adjacent the downstream end thereof, the third exit being  
15 located on the opposite side of the passageway to the side on which the second exit is located, and two of the drafting elements are provided, a second one of the two drafting elements being hingedly coupled to the framework about a corresponding hinge axis and being hingeable between the first state thereof for permitting egress from the passageway through the first exit and preventing egress from the  
20 passageway through the third exit, and the second state for preventing egress from the passageway through the first exit, and permitting egress from the passageway through the third exit.

Preferably, the second one of the drafting elements is hingedly coupled to the  
25 framework between the first and third exits.

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In one embodiment of the invention an urging means is provided corresponding to each drafting element for urging the corresponding drafting element between the first and second states thereof.

- 5 Preferably, each hinge axis extends substantially vertically.

In one embodiment of the invention each drafting element extends in an upstream direction from the hinge axis thereof substantially parallel to the passageway in the first state thereof closing the corresponding one of the second and third exits.

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In another embodiment of the invention each drafting element in the second state thereof extends generally across the passageway at an angle to the passageway greater than zero. Preferably, each drafting element in the second state thereof extends across the passageway at an angle to the passageway in the range of 10°  
15 to 45°. Advantageously, each drafting element in the second state thereof extends across the passageway at an angle to the passageway of approximately 20°.

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In one embodiment of the invention the bore extending through each first cushioning member defines a corresponding central axis extending therethrough and extending substantially parallel to the hinge axis of the corresponding drafting element.

Preferably, each first cushioning member comprises an elongated sheet of material folded to form the first cushioning member, and to define at least a part of the corresponding bore extending therethrough.

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In one embodiment of the invention the folded sheet of material forming each first

cushioning member defines with the free end of the corresponding drafting element the elongated bore.

Preferably, the folded sheet of material forming each first cushioning member  
5 defines a pair of opposite elongated side portions extending parallel to the central axis of the bore of the corresponding first cushioning member, the side portions of the first cushioning member being secured to the corresponding drafting element adjacent the free end thereof.

10 In another embodiment of the invention the side portions of the first cushioning member are secured to the corresponding drafting element with the free end of the drafting element sandwiched between the side portions of the first cushioning member.

15 In one embodiment of the invention the sheet of material forming each first cushioning member comprises a flexible material. Preferably, the sheet of material forming each first cushioning member comprises a resiliently deformable material. Advantageously, the sheet of material forming each first cushioning member comprises a sheet of material reinforced with a fibre material.

20 Preferably, the sheet of material forming each first cushioning member comprises at least a single ply of fibre reinforcing material. Advantageously, the sheet of material forming each first cushioning member comprises at least two spaced apart plies of fibre reinforcing material.

25 In one embodiment of the invention the sheet of material forming each first

cushioning member is of thickness in the range of 4mm to 14mm. Preferably, the sheet of material forming each first cushioning member is of thickness in the range of 6mm to 12mm. Advantageously, the sheet of material forming each first cushioning member is of thickness of approximately 8mm.

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In another embodiment of the invention the maximum transverse width of the bore defined by each first cushioning member in a transverse direction relative to the corresponding drafting element lies in the range of 25mm to 200mm. Preferably, the maximum transverse width of the bore defined by each first cushioning member

10 in a transverse direction relative to the corresponding drafting element lies in the range of 75mm to 150mm. Advantageously, the maximum transverse width of the bore defined by each first cushioning member in a transverse direction relative to the corresponding drafting element is approximately 115mm.

15 In another embodiment of the invention, the maximum transverse length of the bore defined by each first cushioning member extending outwardly from the free end of the corresponding drafting element lies in the range of 25mm to 400mm. Preferably, the maximum transverse length of the bore defined by each first cushioning member extending outwardly from the free end of the corresponding drafting element lies in

20 the range of 100mm to 250mm. Advantageously, the maximum transverse length of the bore defined by each first cushioning member extending outwardly from the free end of the corresponding drafting element is approximately 160mm.

In one embodiment of the invention each first cushioning member comprises one of

25 a rubber material, a synthetic rubber material and a plastics material. Preferably, each first cushioning member comprises a natural rubber material.

In one embodiment of the invention each first cushioning member is secured to the free end of the corresponding drafting element by a mechanical fixing means.

- 5 In one embodiment of the invention at least one first closure element is pivotally coupled to the framework about a first pivot axis, and is pivotal between a closed state preventing access to the passageway through the animal accommodating entrance thereto, and an open state permitting access to the passageway through the animal accommodating entrance, the first closure element extending from the
- 10 first pivot axis to a free end thereof, and the first closure element comprising an elongated resiliently deformable second cushioning member extending along and outwardly from the free end of the first closure element, the second cushioning member at least partly defining an elongated bore extending therethrough.

- 15 Preferably, a pair of the first closure elements are provided, the first closure elements being pivotally coupled about the respective first pivot axes to the framework adjacent respective opposite sides of the passageway, and cooperating with each other in the closed states thereof to prevent access to the passageway through the animal accommodating entrance.

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In one embodiment of the invention a first operating means is provided for operating the first closure elements between the closed state and the open state.

- In another embodiment of the invention each first closure element in the open state
- 25 thereof extends parallel to the passageway, and in the closed state thereof extends substantially transversely of the passageway.

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In another embodiment of the invention at least one second closure element is located in the passageway intermediate the first closure element and the drafting element, the second closure element being pivotally coupled to the framework about a second pivot axis, and being pivotal about the second pivot axis between a closed state preventing passage of an animal through the passageway, and an open state permitting passage of an animal through the passageway, the second closure element extending from the second pivot axis to a free end thereof, and the second closure element comprising one of the elongated resiliently deformable second cushioning members extending along and outwardly from the free end of the second closure element.

Preferably, a pair of the second closure elements are provided, the second closure elements being pivotally coupled about the respective second pivot axes to the framework adjacent respective opposite sides of the passageway, and cooperating with each other in the closed state thereof to prevent passage of an animal through the passageway.

In one embodiment of the invention each second closure element is located adjacent the second exit but upstream thereof.

In another embodiment of the invention a second operating means is provided for operating the second closure element between the closed state and the open state.

Preferably, each second closure element in the open state thereof extends parallel to the passageway, and in the closed state thereof extends substantially transversely

of the passageway.

In one embodiment of the invention the bore extending through each second cushioning member defines a corresponding central axis extending therethrough and  
5 extending substantially parallel to the corresponding one of the first and second pivot axes.

In another embodiment of the invention each second cushioning member comprises an elongated sheet of material folded to form the second cushioning member and to  
10 define the corresponding bore extending therethrough.

In a further embodiment of the invention the folded sheet of material forming each second cushioning member defines a pair of opposite elongated side portions extending parallel to the central axis thereof, the side portions of the corresponding  
15 second cushioning member being secured to the corresponding one of the first and second closure elements adjacent the free end thereof.

Preferably, the side portions of each second cushioning member are secured together to define the bore extending through the second cushioning member.

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In one embodiment of the invention the sheet of material forming each second cushioning member comprises a flexible material. Preferably, the sheet of material forming each second cushioning member comprises a resiliently deformable material. Advantageously, the sheet of material forming each second cushioning  
25 member comprises a sheet of material reinforced with a fibre material.

Preferably, the sheet of material forming each second cushioning member comprises at least a single ply of fibre reinforcing material. Advantageously, the sheet of material forming each second cushioning member comprises at least two spaced apart plies of fibre reinforcing material.

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In one embodiment of the invention the sheet of material forming each second cushioning member is of thickness in the range of 4mm to 15mm. Preferably, the sheet of material forming each second cushioning member is of thickness in the range of 6mm to 12mm. Advantageously, the sheet of material forming each second cushioning member is of thickness of approximately 8mm.

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In another embodiment of the invention the maximum transverse width of the bore defined by each second cushioning member in a transverse direction relative to the corresponding one of the first and second closure elements lies in the range of 25mm to 200mm. Preferably, the maximum transverse width of the bore defined by each second cushioning member in a transverse direction relative to the corresponding one of the first and second closure elements lies in the range of 50mm to 150mm. Advantageously, the maximum transverse width of the bore defined by each second cushioning member in a transverse direction relative to the corresponding one of the first and second closure elements is approximately 80mm.

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In another embodiment of the invention the maximum transverse length of the bore defined by each second cushioning element extending outwardly from the free end of the corresponding one of the first and second closure elements lies in the range of 25mm to 400mm. Preferably, the maximum transverse length of the bore defined by each second cushioning element extending outwardly from the free end of the

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corresponding one of the first and second closure elements lies in the range of 100mm to 300mm. Advantageously, the maximum transverse length of the bore defined by each second cushioning element extending outwardly from the free end of the corresponding one of the first and second closure elements is approximately  
5 180mm.

In one embodiment of the invention each second cushioning member comprises one of a rubber material, synthetic rubber material, and a plastics material. Preferably, each second cushioning member comprises a natural rubber material.

10 In one embodiment of the invention each second cushioning member is secured to the corresponding one of the first and second closure elements by mechanical fixing means.

15 In another embodiment of the invention each of the first and second pivot axes extend substantially vertically.

The invention also provides a controlled animal access system defining an animal accommodating entrance adapted to accommodate an animal therethrough, and  
20 comprising a first closure element located in the animal accommodating entrance and pivotal about a first pivot axis between a closed state closing the animal accommodating entrance and an open state for permitted access to an animal through the animal accommodating entrance, the first closure element extending from the first pivot axis to a free end thereof, and an elongated resiliently deformable  
25 cushioning member extending along and outwardly from the free end of the first closure element, the cushioning member at least partly defining an elongated bore

extending therethrough.

In one embodiment of the invention a pair of first closure elements are located in the animal accommodating entrance, the first closure elements being pivotal about  
5    respective ones of the first pivot axes located adjacent respective opposite sides of the animal accommodating entrance, and in the closed state the first closure elements extend from the respective first corresponding pivot axes towards each other with the respective first closure elements adjacent but slightly spaced apart from each other.

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In another embodiment of the invention an animal accommodating passageway is defined extending from the animal accommodating entrance.

Preferably, the passageway is defined by a pair of spaced apart side walls extending  
15    from the animal accommodating entrance.

In another embodiment of the invention the passageway terminates in an animal accommodating exit, and a second closure element is located in the animal accommodating exit and is pivotal about a second pivot axis between a closed state  
20    closing the animal accommodating exit, and an open state for permitting egress of an animal through the animal accommodating exit, the second closure element extending from the second pivot axis to a free end thereof, and the second closure element comprising one of the elongated resiliently deformable cushioning members extending along and outwardly from the free end of the second closure element.

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In one embodiment of the invention a pair of second closure elements are located in

the animal accommodating exit, the second closure elements being pivotal about respective ones of the second pivot axes located adjacent respective opposite sides of the animal accommodating exit, and in the closed state the second closure elements extend from the respective corresponding second pivot axes towards each other with the respective second closure elements adjacent but slightly spaced apart from each other.

In one embodiment of the invention a communicating means is located adjacent the animal accommodating passageway for communicating with an RFID tag or device secured on an animal for reading a signal indicative of the identity of an animal located in the passageway from the RFID tag or device secured to the animal.

In another embodiment of the invention the bore extending through each cushioning member defines a central axis extending therethrough and extending substantially parallel to the one of the first and second pivot axes of the corresponding one of the first and second closure elements.

In another embodiment of the invention each cushioning member comprises an elongated sheet of material folded to form the corresponding cushioning member and to define the bore extending therethrough. Preferably, the folded sheet of material forming each cushioning member defines a pair of opposite elongated side portions extending parallel to the central axis thereof, the side portions of the corresponding cushioning member being secured to the corresponding one of the first and second closure elements adjacent the free end thereof. Advantageously, the side portions of each cushioning member are secured together to define the bore extending through the cushioning member.

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In one embodiment of the invention the sheet of material forming each cushioning member comprises a flexible material. Preferably, the sheet of material forming each cushioning member comprises a resiliently deformable material.

- 5 Advantageously, the sheet of material forming each cushioning member comprises a sheet of material reinforced with a fibre material.

- In one embodiment of the invention the sheet of material forming each cushioning member comprises at least a single ply of fibre reinforcing material. Preferably, the  
10 sheet of material forming each cushioning member comprises at least two spaced apart plies of fibre reinforcing material.

- In one embodiment of the invention the sheet of material forming each cushioning member is of thickness in the range of 4mm to 15mm. Preferably, the sheet of  
15 material forming each cushioning member is of thickness in the range of 6mm to 12mm. Advantageously, the sheet of material forming each cushioning member is of thickness of approximately 8mm.

- In another embodiment of the invention, the maximum transverse width of the bore  
20 defined by each cushioning member in a transverse direction relative to the corresponding closure element lies in the range of 25mm to 200mm. Preferably, the maximum transverse width of the bore defined by each cushioning member in a transverse direction relative to the corresponding closure element lies in the range of 50mm to 150mm. Advantageously, the maximum transverse width of the bore  
25 defined by each cushioning member in a transverse direction relative to the corresponding closure element is approximately 80mm.

In another embodiment of the invention, the maximum transverse length of the bore defined by each cushioning member extending outwardly from the free end of the corresponding closure element lies in the range of 25mm to 400mm. Preferably, the maximum transverse length of the bore defined by each cushioning member extending outwardly from the free end of the corresponding closure element lies in the range of 100mm to 300mm. Advantageously, the maximum transverse length of the bore defined by each cushioning member extending outwardly from the free end of the corresponding closure element is approximately 180mm.

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In one embodiment of the invention each cushioning member comprises one of a rubber material or synthetic rubber material and a plastics material. Preferably, each cushioning member comprises a natural rubber material.

15 In one embodiment of the invention each cushioning member is secured to the corresponding one of the first and second closure elements by mechanical fixing means.

Additionally the invention provides a drafting element adapted for hingedly coupling to a framework of an animal drafting system about a hinge axis, the drafting element extending from the hinge axis to a free end thereof, and comprising an elongated resiliently deformable cushioning member extending along and outwardly from the free end of the drafting element, the cushioning member at least partly defining an elongated bore extending therethrough.

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In one embodiment of the invention the bore extending through the cushioning

member defines a central axis extending therethrough and extending substantially parallel to the hinge axis of the drafting element.

In another embodiment of the invention the cushioning member comprises an  
5 elongated sheet of material folded to form the cushioning member and to define at least a part of the bore extending therethrough.

Preferably, the folded sheet of material forming the cushioning member defines with the free end of the drafting element the elongated bore.

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Advantageously, the folded sheet of material forming the cushioning member defines a pair of opposite elongated side portions extending parallel to the central axis of the bore of the cushioning member, the side portions of the cushioning member being secured to the drafting element adjacent the free end thereof.

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In one embodiment of the invention the sheet of material forming the cushioning member comprises a flexible material. Preferably, the sheet of material forming the cushioning member comprises a resiliently deformable material. Advantageously, the sheet of material forming the cushioning member comprises a sheet of material  
20 reinforced with a fibre material.

In one embodiment of the invention the sheet of material forming the cushioning member comprises at least a single ply of fibre reinforcing material. Preferably, the sheet of material forming the cushioning member comprises at least two spaced  
25 apart plies of fibre reinforcing material.

In one embodiment of the invention the sheet of material forming the cushioning member is of thickness in the range of 4mm to 15mm. Preferably, the sheet of material forming the cushioning member is of thickness in the range of 6mm to 12mm. Advantageously, the sheet of material forming the cushioning member is of thickness of approximately 8mm.

In another embodiment of the invention, the maximum transverse width of the bore defined by the cushioning member in a transverse direction relative to the drafting element lies in the range of 25mm to 200mm. Preferably, the maximum transverse width of the bore defined by the cushioning member in a transverse direction relative to the drafting element lies in the range of 75mm to 150mm. Advantageously, the maximum transverse width of the bore defined by the cushioning member in a transverse direction relative to the drafting element is approximately 115mm.

In another embodiment of the invention, the maximum transverse length of the bore defined by the cushioning member extending outwardly from the free end of the drafting element lies in the range of 25mm to 400mm. Preferably, the maximum transverse length of the bore defined by the cushioning member extending outwardly from the free end of the drafting element lies in the range of 100mm to 250mm. Advantageously, the maximum transverse length of the bore defined by the cushioning member extending outwardly from the free end of the drafting element is approximately 160mm.

In one embodiment of the invention the cushioning member comprises one of a rubber material, a synthetic rubber material and a plastics material. Preferably, the cushioning member comprises a natural rubber material.

In one embodiment of the invention the cushioning member is secured to the free end of the drafting element by a mechanical fixing means.

5 In another embodiment of the invention the drafting element comprises a gate.

Further the invention provides a closure element adapted for closing an animal accommodating entrance, the closure element being pivotal about a pivot axis and extending from the pivot axis to a free end thereof, and comprising an elongated  
10 resiliently deformable cushioning member extending along and outwardly from the free end of the closure element, the cushioning member at least partly defining an elongated bore extending therethrough.

In one embodiment of the invention the bore extending through the cushioning  
15 member defines a central axis extending therethrough and extending substantially parallel to the pivot axis of the closure element.

In another embodiment of the invention the cushioning member comprises an elongated sheet of material folded to form the cushioning member and to define at  
20 least a part of the bore extending therethrough.

Preferably, the folded sheet of material forming the cushioning member defines a pair of opposite elongated side portions extending parallel to the central axis of the bore of the cushioning member, the side portions of the cushioning member being  
25 secured to the closure element adjacent the free end thereof.

Advantageously, the side portions of the cushioning member are secured together.

In another embodiment of the invention the sheet of material forming the cushioning member comprises a flexible material. Preferably, the sheet of material forming the cushioning member comprises a resiliently deformable material. Advantageously, the sheet of material forming the cushioning member comprises a sheet of material reinforced with a fibre material.

In one embodiment of the invention the sheet of material forming the cushioning member comprises at least a single ply of fibre reinforcing material. Preferably, the sheet of material forming the cushioning member comprises at least two spaced apart plies of fibre reinforcing material.

In another embodiment of the invention the sheet of material forming the cushioning member is of thickness in the range of 4mm to 15mm. Preferably, the sheet of material forming the cushioning member is of thickness in the range of 6mm to 12mm. Advantageously, the sheet of material forming the cushioning member is of thickness of approximately 8mm.

In another embodiment of the invention, the maximum transverse width of the bore defined by the cushioning member in a transverse direction relative to the closure element lies in the range of 25mm to 200mm. Preferably, the maximum transverse width of the bore defined by the cushioning member in a transverse direction relative to the closure element lies in the range of 50mm to 150mm. Advantageously, the maximum transverse width of the bore defined by the cushioning member in a transverse direction relative to the closure element is approximately 80mm.

In another embodiment of the invention, the maximum transverse length of the bore defined by the cushioning member extending outwardly from the free end of the closure element lies in the range of 25mm to 400mm. Preferably, the maximum transverse length of the bore defined by the cushioning member extending outwardly from the free end of the closure element lies in the range of 100mm to 300mm. Advantageously, the maximum transverse length of the bore defined by the cushioning member extending outwardly from the free end of the closure element is approximately 180mm.

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In one embodiment of the invention the cushioning member comprises one of a rubber material, a synthetic rubber material and a plastics material. Preferably, the cushioning member comprises a natural rubber material.

15 In one embodiment of the invention the cushioning member is secured to the free end of the closure element by a mechanical fixing means.

In another embodiment of the invention the closure element comprises a plate member.

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The advantages of the invention are many. A particularly important advantage of the invention is that there is little or no danger of an animal being injured in the event of a drafting element being urged from one of the first and second states thereof to the other one of the first and second states while an animal is still passing through the relevant one of the first, second or third exit. This advantage is achieved by virtue of the provision of the first cushioning member on the free end of each of the drafting

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elements. By providing the first cushioning member as a resiliently deformable member, the first cushioning member deforms on engagement with an animal thereby avoiding injury to the animal. The provision of the first cushioning member with an elongated bore extending therethrough further enhances the resilient

5 deformability of the first cushioning member, thereby further minimising the risk of injury to the animal. It has been found that the provision of the bore extending longitudinally through the first cushioning member results in the first cushioning member having a greater degree of deformability thereby further minimising the likelihood of injury to the animal. By providing the first cushioning member of a

10 natural rubber material a further advantage is achieved in that the first cushioning member, as well as being resiliently deformable, is also relatively soft, thereby further minimising injury to the animal. Additionally, the provision of the first cushioning member with a bore extending therethrough and being formed from a sheet of material folded to form the bore extending through the cushioning member

15 results in the first cushioning member being provided without corners. The cushioning member when formed from a folded sheet of material to define a bore extending therethrough presents a smooth curved surface to the animal, thereby virtually eliminating any danger of injury to the animal. Similar advantages and benefits are achieved by providing second cushioning members along and extending

20 from the first and second closure elements.

The invention will be more clearly understood from the following description of an embodiment thereof which is given by way of example only with reference to the accompanying drawings, in which:

Fig. 1 is a perspective view of an animal drafting system according to the invention,

Fig. 2 is a perspective view similar to Fig. 1 of the animal drafting system of Fig. 1 illustrating the animal drafting system in a different state to that of Fig. 1,

Fig. 3 is a perspective view similar to Fig. 1 of the animal drafting system of Fig. 1 illustrating the animal drafting system of Fig. 1 in a different state to that of Figs. 1 and 2,

Fig. 4 is a perspective view similar to Fig. 1 of the animal drafting system of Fig. 1 illustrating the animal drafting system in a different state to that of Figs. 1 to 3,

Fig. 5 is a perspective view of a portion of the animal drafting system of Fig. 1,

Fig. 6 is a perspective view similar to Fig. 5 of the animal drafting system of Fig. 5 in a different state to that of Fig. 5,

Fig. 7 is a perspective view similar to Fig. 5 of the portion of Fig. 5 illustrating the portion of Fig. 5 in a different state to that of Figs. 5 and 6,

Fig. 8 is a perspective view of another portion of the animal drafting system of Fig. 1,

Fig. 9 is a perspective view of the portion of Fig. 8 of the animal drafting system of Fig. 1 in a different state to that of the portion of Fig. 8,

Fig. 10 is a top plan view of the animal drafting system of Fig. 1,

Fig. 11 is a view similar to Fig. 10 of the animal drafting system of Fig. 1 in a  
5 different state to that of Fig. 10,

Fig. 12 is a view similar to Fig. 10 of the animal drafting system of Fig. 1 in a  
different state to that of Figs. 10 and 11,

10 Fig. 13 is a view similar to Fig. 10 of the animal drafting system of Fig. 1 in a  
further different state to that of Figs. 10 to 12,

Fig. 14 is a perspective view of a portion of the animal drafting system of Fig. 1,

15 Fig. 15 is a side elevational view of the portion of Fig. 15 of the animal drafting  
system of Fig. 1,

Fig. 16 is an end elevational view of the portion of Fig. 14 of the animal drafting  
system of Fig. 1,

20 Fig. 17 is a top plan view of the portion of Fig. 14 of the animal drafting system  
of Fig. 1,

Fig. 18 is a perspective view of another portion of the animal drafting system of  
25 Fig. 1,

Fig. 19 is a side elevational view of the portion of Fig. 18 of the animal drafting system of Fig. 1,

Fig. 20 is an end elevational view of the portion of Fig. 18 of the animal drafting system of Fig. 1,

Fig. 21 is a top plan view of the portion of Fig. 18 of the animal drafting system of Fig. 1,

Fig. 22 is an enlarged perspective view of a detail of the animal drafting system of Fig. 1,

Fig. 23 is a cross-sectional top plan view of a detail of another portion of the animal drafting system of Fig. 1,

Fig. 24 is an enlarged perspective view of another detail of the animal drafting system of Fig. 1,

Fig. 25 is a top plan view of a detail of the animal drafting system of Fig. 1,

Fig. 26 is a top plan view of another detail of the animal drafting system of Fig. 1,

Fig. 27 is a perspective view of a controlled animal access system which is also according to the invention, and

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Fig. 28 is another perspective view of the controlled animal access system of Fig. 27.

Referring to the drawings and initially to Figs. 1 to 26 there is illustrated a drafting  
 5 system according to the invention indicated generally by the reference numeral 1 for  
 drafting an animal into one or more holding areas in order to enable tests,  
 investigations or procedures to be carried out on the animal. The animal drafting  
 system 1 comprises an elongated main framework 3 comprising a pair of  
 longitudinally extending transversely spaced apart side frames 5 and 6. The side  
 10 frames 5 and 6 define therebetween an elongated animal accommodating  
 passageway 7 extending from an upstream end 8 to a downstream end 9.

Each one of the side frames 5 and 6 comprises an upstream stanchion 10, a  
 downstream stanchion 12 and an intermediate stanchion 14. The upstream  
 15 stanchions 10 of the respective side frames 5 and 6 are joined by an upstream lower  
 cross-member 15 and an upstream upper cross-member 16. The upstream  
 stanchions 10 and the upstream lower and upper cross-members 15 and 16 define  
 an animal entrance 17 to the passageway 7. The upstream lower cross-member 15  
 is provided with fixing openings 19 for accommodating masonry bolts or other  
 20 suitable mechanical fixings for securing the upstream stanchions 10 to the ground.

A pair of first closure elements, also according to the invention provided by first  
 gates 21 are pivotally coupled to the respective upstream stanchions 10 about  
 respective vertically extending first pivot axes 22, as will be described below, and are  
 25 pivotal about the first pivot axes 22 between a closed state, illustrated in Fig. 4,  
 extending transversely from the upstream stanchions 10 into the passageway 7 for

preventing access through the entrance 17 into the passageway 7, and an open state, illustrated in Fig. 1, with the first gates 21 extending in a generally downstream direction parallel to the side frames 5 and 6 with the entrance 17 open permitting access therethrough to the passageway 7.

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The intermediate stanchions 14 are joined by an intermediate lower cross-member 25 and an intermediate upper cross-member 26. The intermediate lower cross-member 25 is provided with fixing openings 27 for accommodating masonry bolts or other suitable mechanical fixings for securing the intermediate lower cross-member 25 to the ground. The intermediate stanchions 14 and the intermediate lower and upper cross-members 25 and 26 divide the main framework 3, and in turn the passageway 7 into an upstream or holding section 29 and a downstream drafting section 30.

15 In this embodiment of the invention a pair of second closure elements also according to the invention comprise second gates 32, which are pivotally coupled to the respective intermediate stanchions 14 about respective vertically extending second pivot axes 33. The second gates 32 are pivotal about the second pivot axes 33 between a closed state, illustrated in Fig. 4, extending transversely from the intermediate stanchions 14 into the passageway 7 for preventing access from the holding section 29 to the drafting section 30 and for retaining the animal in the holding section 29, and an open state, illustrated in Fig. 1, with the second gates 32 extending in a generally upstream direction parallel to the side frames 5 and 6, for permitting the animal to pass from the holding section 29 to the drafting section 30.

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25 In some embodiments of the invention it is envisaged that the second gates 32 may be omitted.

A pair of secondary frameworks 34 join the intermediate stanchions 14 to the corresponding upstream stanchions 10 of the respective side frames 5 and 6, and define the holding section 29.

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The downstream stanchions 12 are joined by a downstream lower cross-member 35 and a downstream upper cross-member 36. The downstream lower cross-member 35 is provided with fixing openings 37 for accommodating masonry bolts or other suitable mechanical fixings for securing the lower cross-member 25 to the ground.

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The downstream stanchions 12 and the downstream lower and upper cross-members 35 and 36 define a downstream animal accommodating first central exit 38, which defines a first exit opening defining a plane extending transversely of the passageway 7, for accommodating an animal therethrough from the passageway 7. The first central exit 38 is centrally aligned with the passageway 7.

15

The intermediate stanchions 14 and the downstream stanchions 12 of the respective side frames 5 and 6 are joined by corresponding upper longitudinally extending members 39 of the side frames 5 and 6. The upper longitudinal member 39 of the side frame 5 defines with the corresponding downstream stanchion 12 and the corresponding intermediate stanchion 14 a downstream animal accommodating second side exit 40 in the side frame 5 from the passageway 7. The upper longitudinal member 39 of the side frame 6 defines with the corresponding downstream stanchion 12 and the corresponding intermediate stanchion 14 of the side frame 6 a downstream animal accommodating third side exit 42 in the side frame 6 from the passageway 7.

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A pair of similar drafting elements comprise a first drafting gate 45 and a second drafting gate 46, each of which are also according to the invention, and are provided for selectively determining the one of the first central exit 38, the second side exit 40 and the third side exit 42 through which an animal is to exit the passageway 7. The first drafting gate 45 is hingedly coupled to the downstream stanchion 12 of the side frame 5 about a corresponding vertically extending first hinge axis 48. The second drafting gate 46 is hingedly coupled to the downstream stanchion 12 about a corresponding vertically extending second hinge axis 49. The first and second drafting gates 45 and 46 are hingeable about the corresponding ones of the first and second hinge axes 48 and 49 between respective first states and second states.

In the first state of each one of the first and second drafting gates 45 and 46, the drafting gate in the first state extends from the corresponding hinge axis 48 or 49 in a generally upstream direction substantially parallel to the corresponding one of the side frames 5 and 6, thereby closing the corresponding one of the second and third side exits 40 and 42. In other words, the first drafting gate 45 in the first state closes the second side exit 40, and the second drafting gate 46 in the second state closes the third side exit 42.

Each one of the first and second drafting gates 45 and 46 in the second state thereof extends from the corresponding one of the first and second hinge axes 48 and 49 in a generally upstream direction across the passageway 7 at an angle  $\alpha$  of approximately  $20^\circ$  to the corresponding one of the side frames 5 and 6 to the other one of the side frames 5 and 6, see Figs. 11 and 12. Thereby, the one of the first and second drafting gates 45 and 46 which is in the second state permits egress from the passageway 7 through the one of the second and third side exits 40 and 42

corresponding to the one of the drafting gates 45 and 46 in the second state, and preventing egress from the passageway 7 through the first central exit 38 and the other one of the second and third side exits 40 and 42.

5 In Figs. 1, 10 and 13 both of the first and second drafting gates 45 and 46 are illustrated in the first states thereof, with egress from the passageway permitted through the first central exit 38 and prevented through the second and third side exits 40 and 42. In Figs. 2 and 11 the first drafting gate 45 is illustrated in the second state, and the second drafting gate 46 is illustrated in the first state with  
10 egress from the passageway 7 permitted through the second side exit 40 and prevented through the first central exit 38 and the third side exit 42. In Figs. 3 and 12 the states of the drafting gates 45 and 46 are reversed, and egress from the passageway 7 is permitted through the third side exit 42 and prevented through the first central exit 38 and the second side exit 40.

15

Each one of the first and second drafting gates 45 and 46 comprises a first upstanding member 50 and a spaced apart second upstanding member 52 which are joined by a plurality of spaced apart longitudinally extending cross-members 54. An intermediate upstanding member 55 spaced apart between the first and second  
20 upstanding members 50 and 52 extends upwardly between the cross-members 54. A pair of pivot pins 57 extend from the respective opposite ends of the first upstanding member 50 of each one of the first and second gates 45 and 46 and are pivotally engageable in corresponding upper and lower pivot mounting brackets 58 extending from the corresponding one of the downstream stanchions 12. The pivot  
25 pins 57 of the respective first and second drafting gates 45 and 46 define the corresponding one of the first and second hinge axes 48 and 49 about which the

corresponding one of the first and second drafting gates 45 and 46 are hingeable between the first and second states thereof. The second upstanding members 52 of each drafting gate 45 and 46 defines a free end 60 of the corresponding one of the drafting gates 45 and 46.

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An elongated first cushioning member 62 is secured to the free end 60 of each one of the first and second drafting gates 45 and 46 and extends along and radially outwardly from the second upstanding member 52 relative to the corresponding one of the first and second hinge axes 48 and 49. The first cushioning members 62 are  
10 of a resiliently deformable material, as will be described below, in order to minimise, and in general, to avoid injury to an animal in the event of one of the first and second drafting gates 45 and 46 being operated between the relevant one of the first and second states and catching the animal as the animal is exiting the passageway through a corresponding one of the first central exit 38 and the second and third side  
15 exits 40 and 42.

Each first cushioning member 62 comprises a sheet 64 of resiliently deformable material, namely, natural rubber material reinforced with two spaced apart plies 65 of fibre reinforcing material, see Fig. 23. The fibre reinforcing material may be woven  
20 or non-woven. The sheet 64 of each first cushioning member 62 is folded to partly form an elongated bore 66 of partly circular transverse cross-section defining a longitudinally extending central axis 67 extending therethrough. In this embodiment of the invention the folded sheet 64 of each first cushioning member 62 defines opposite side portions 68, which when the first cushioning member 62 is secured to  
25 the free end 60 of the corresponding one of the first and second drafting gates 45 and 46, sandwich the second upstanding member 52 of the corresponding one of

the first and second drafting gates 45 and 46 therebetween. Accordingly, in this embodiment of the invention the folded sheet 64 of each first cushioning member 62 defines the bore 66 with the second upstanding member 52 of the corresponding one of the first and second drafting gates 45 and 46. The side portions 68 of the

5 folded sheet 64 of each first cushioning member 62 are secured to the second upstanding member 52 of the corresponding one of the first and second drafting gates 45 and 46 by mechanical fixings, in this embodiment of the invention threaded bolts 70 which extend through the side portions 68 and the second upstanding member 52. Nuts 71 on the threaded bolts 70 secure the side portions 68 of the

10 folded sheet 64 to the second upstanding member 52 of the corresponding one of the first and second drafting gates 45 and 46.

The sheet 64 of each first cushioning member 62 is of thickness  $t_1$  of approximately 8mm, see Fig. 23. The maximum transverse width  $w_1$  of the bore 66 of each first

15 cushioning member 62 in a direction transverse relative to the corresponding one of the first and second drafting gates 45 and 46 is approximately 115mm, see Figs. 17, 22 and 25. The maximum transverse length  $l_1$  of the bore 66 of each first cushioning member 62 extending outwardly from the second upstanding member 52 of the corresponding one of the first and second drafting gates 45 and 46 is approximately

20 160mm, see Figs. 17, 22 and 23.

A pair of urging means in this embodiment of the invention comprising a pair of pneumatic rams 75 acting between the downstream upper cross-member 36 and the corresponding one of the first and second drafting gates 45 and 46 operate the

25 drafting gates 45 and 46 between the first and second states thereof. The pneumatic rams 75 are coupled to the downstream upper cross-member 36 by a

coupling bracket 76, and are coupled to the respective first and second drafting gates 45 and 46 by coupling brackets 77 secured to the intermediate upstanding member 55 of the corresponding one of the first and second drafting gates 45 and 46.

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Returning now to the first gates 21, each first gate 21 comprises a plate member 78 of steel extending radially from an elongated carrier member 79 and terminating in a free end 74. A pair of pivot pins 80 extend from upper and lower ends of the carrier member 79 and are pivotally engaged in upper and lower pivot mounting buckets 81 and 82 extending from the corresponding one of the upstream stanchions 10. The pivot pins 80 define the first hinge axes 22 about which the first gates 21 are pivotal between the open and closed states.

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An elongated second cushioning member 87 extends along and outwardly from the free end 74 of the plate member 78 of each first gate 21, in order to avoid injury to an animal in the event of the first gates 21 being operated into the closed state prior to the animal having passed through the entrance 17 into the passageway 17. The second cushioning members 87 of the first gates 21 are substantially similar to the first cushioning members 62 of the drafting gates 45 and 46. Each second cushioning member 87 is formed from a sheet 88 of natural rubber material reinforced with two spaced apart plies of fibre reinforcing material similar to the sheets 64 from which the first cushioning members 62 are formed, and is of similar thickness  $t_2$  to the thickness  $t_1$  of the sheets 64 of the first cushioning members 64, see Fig. 23. The fibre reinforcing material may be woven or non-woven. The sheets 88 of the second cushioning members 87 are folded to form the second cushioning members 87 in a substantially similar manner as the sheets 64 are folded to form the

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first cushioning members 62. However, in this embodiment of the invention side portions 89 of each sheet 88, abut each other, and are secured together and to the corresponding plate member 78 adjacent the free end 74 by a clamping plate 86 and mechanical fixings, namely, threaded bolts 90 and nuts 91 with the side portions 89

5 clamped between the clamping plate 86 and the plate member 78. The sheet 64 of each second cushioning member 87, when folded with the side portions secured together, defines an elongated bore 84 of partly circular transverse cross-section extending longitudinally through the second cushioning member 87, which defines a central axis 85 extending parallel to the first pivot axis 22 of the corresponding first

10 gate 21. The maximum transverse width  $w_2$  of the bore 84 of each second cushioning member 87 in a transverse direction relative to the plate member 78 of the corresponding first gate 21 is approximately 80mm, see Figs. 24 and 26. The maximum transverse length  $l_2$  of the bore 84 of each second cushioning member 87 extending outwardly from the free end 74 of the plate member 78 of the

15 corresponding first gate 21 is approximately 180mm, see Figs. 24 and 26.

A first operating means for operating the first gates 21 between the open and closed states comprises a first pneumatic ram 92, which acts between one of the upstream stanchions 10 and a linkage mechanism 93 coupled to the respective first gates 21.

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The second gates 32 are similar to the first gates 21, and the components of the second gates 32 which are similar to the components of the first gates 21 are identified by the same reference numerals. Each second gate 32 comprises a plate member 78 which extends radially from a carrier member 79, which in turn is

25 pivotally coupled to the corresponding one of the intermediate stanchions 14 by pivot pins 80 engaging upper and lower pivot mounting brackets 81 and 82. Additionally,

each second gate 32 is provided with a second cushioning member 87, similar to the second cushioning members 87 of the first gates 21. The second cushioning members 87 are secured by threaded bolts 90 and nuts 91 to the plate members 78 of the second gate 32 adjacent the free ends 74 thereof, and extend radially outwardly from the free ends 74 of the plate members 78 relative to the second pivot axes 33 of the second gates 32.

The second gates 32 are operated between the open and closed states by a second operating means comprising a second pneumatic ram 96. The second pneumatic ram 96 is coupled between one of the intermediate stanchions 14 and a linkage mechanism 97 coupled to the second gates 32.

A pair of RFID antenna panels 98 are located in the secondary frameworks 34 of the side frames 5 and 6 for communicating with RFID tags or devices attached to the animals for reading the identities of the animals as they pass through the holding section 29 from the RFID tags or devices, and also for reading other data stored in the RFID tags or devices of the animals relating to monitored characteristics of the animal, which would be monitored by the RFID device attached to the animal. Such monitored characteristics may, for example, be feeding, drinking and activity patterns of the animal and health indicators.

A housing 99 mounted on the secondary framework 34 of the side frame 6 houses a signal processor (not shown) for reading and processing the data read from the RFID tags and devices of the animals as the animals pass through the holding section 29 of the passageway 7. The housing 99 also houses electronic control circuitry (not shown) for controlling the operation of the pneumatic rams 75 for

operating the drafting gates 45 and 46 and the first and second pneumatic rams 92 and 96 for operating the first gates 21 and the second gates 32, respectively, between the open and closed states. Proximity sensors, in this embodiment of the invention comprising light sensors (not shown) are located at appropriate locations in the main framework 3 for monitoring the passage of an animal through the passageway 7.

In use, the pneumatic rams 75 and the first and second pneumatic rams 92 and 96 are operated under the control of the control circuitry in the housing 99. Initially, on an animal approaching the drafting system 1, with the second gates 32 in the closed state, the first gates 21 are operated by the first pneumatic ram 92 into the open state to admit the animal into the holding section 29 of the passageway 7. The identity of the animal is read from the RFID tag or device attached to the animal in the holding section 29, and data relating to the animal is also read from the RFID tag or device of the animal while the animal is in the holding section 29. If the animal is to be allowed through the passageway 7 and to exit through the first central exit 38, if the first and second drafting gates 45 and 46 are not already in their respective first states, the pneumatic rams 75 are operated to urge the first and second drafting gates 45 and 46 into their respective first states. The second gates 32 are then operated by the second pneumatic ram 96 into the open state to allow the animal to pass through the passageway 7 and exit through the first central exit 38.

On the other hand, if the animal is to be drafted through either the second or third side exits 40 or 42, or as a result of data read from the RFID tag or device attached to the animal, it would be appropriate to draft the animal through one of the second and third side exits 40 and 42, the appropriate one of the pneumatic rams 75 is

operated to operate the relevant one of the first and second drafting gates 45 and 46 into the second state, while leaving the other one of the first and second drafting gates 45 and 46 in the first state. The second gates 32 are then operated by the second pneumatic ram 96 into the open state to allow the animal pass into the drafting section 30, and in turn through the relevant one of the second and third side exits 40 and 42.

As the animal is passing through the first and second gates 21 and 32, if the animal is slow passing through the relevant first and second gates 21 and 32, and the relevant ones of the first and second gates 21 and 32 engage the animal, due to the second cushioning members 87 being provided on the free ends 74 of the first and second gates 21 and 32, the animal is engaged by the relevant second cushioning members 87, thereby avoiding any danger of injury to the animal. Similarly, should either of the first and second drafting gates 45 and 46 be activated from one of the first and second states thereof to the other one of the first and second states, while an animal is passing through either the passageway 7 to exit through the first central gate 36, or is passing through one of the second and third side exits 40 and 42, there is no danger of the animal being injured, since the animal would be engaged by the first cushioning member 62 on the relevant one of the first and second drafting gates 45 and 46.

Referring now to Figs. 27 and 28, there is illustrated a controlled animal access system also according to the invention and indicated generally by the reference numeral 200. The controlled animal access system may be use for any purpose, where it is required to control access to a location, for example, a milking parlour or any other location to which controlled access for animals is required, and in

particular, where it is desired that the animals should enter the location, milking parlour or the like in single file. The controlled animal access system comprises a pair of spaced apart side frameworks 202 which are substantially similar to the secondary frameworks 34 of the animal drafting system 1 and extend rearwardly from an access frame 204. The side framework 202 define an animal accommodating passageway 205 extending therethrough from an upstream end 207 to a downstream end 209. The access frame 204 defines an access opening 210 adjacent the upstream end 207 to the animal accommodating passageway 205, and the side frameworks 202 adjacent the downstream end 209 thereof define an exit opening 211 from the animal passageway 205. The access opening 210, the exit opening 211, and the animal accommodating passageway 205 are sized to accommodate an animal, for example, a cow, a bull, or the like therethrough in single file.

The access frame 204 comprises a pair of spaced apart upstanding stanchions 212 which extend upwardly from a lower cross-member 214 to an upper cross-member 215, which joins the upstanding stanchions 212 adjacent upper ends thereof. The lower cross-member 214 is provided with fixing openings 217 for accommodating masonry bolts or other suitable fixings for fixing the access frame 204 and in turn the animal access system 200 to the ground.

A pair of first closure elements 219 are pivotally coupled to the respective upstanding stanchions 212 and are pivotal between a closed state illustrated in Fig. 27 preventing access through the access opening 210, and an open state illustrated in Fig. 28 for accommodating an animal therethrough into the passageway 205. The first closure elements 219 are substantially similar to the first gates 21 of the animal

drafting apparatus 1, and each first closure element 219 comprises a plate member 220 of steel plate material extending radially from an elongated carrier member 222. The carrier member 222 of each first closure element 219 is pivotally coupled to the corresponding upstanding stanchion 212 by an upper pivot mounting bracket 223 and a lower pivot mounting bracket 224 extending inwardly into the access opening 210 from the corresponding upstanding stanchion 212. Spigots 225 extending upwardly and downwardly, from the upper and lower ends of the carrier members 222, pivotally engage pivot openings 227 in the corresponding upper and lower pivot mounting brackets 223 and 224 extending from the corresponding upstanding stanchion 212. The spigots 225 extending from each carrier member 222 are axially aligned, and define a first pivot axis 229 about which the corresponding first closure element 219 is pivotal between the open and closed states.

An elongated cushioning member 232 is secured to each first closure element 219 adjacent the free end 230 and extends outwardly therefrom in a radial direction relative to the pivot axis 229 of the corresponding first closure element 219. The cushioning members 232 are identical to the second cushioning members 87 of the animal drafting system described with reference to Figs. 1 to 26, and are secured to the plate members 220 of the first closure elements 219 adjacent the free ends 230 thereof by bolts 235 and nuts 236 in a substantially similar manner as the second cushioning members 87 are secured to the plate members 78 of the first and second gates 21 and 32 of the animal drafting apparatus. The plate members 220 and the cushioning members 232 of the respective first closure elements 219 are configured so that when the first closure elements 219 are in the closed state, the cushioning members 232 of the respective first closure elements 219 extend towards each other but are slightly spaced apart from each other. Each cushioning member 232 defines

a bore 238 extending therethrough, which in turn defines a central axis 239 extending parallel to the first pivot axis 229 of the corresponding first closure element 219.

5 An operating means, in this embodiment of the invention a pneumatic ram 240 operates the first closure elements 219 between the open and closed states. The pneumatic ram 240 is coupled between one of the upstanding stanchions 212 of the access frame 204 and a linkage mechanism 242 connected to the first closure elements 219.

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As discussed above, the two side frameworks 202 are similar to the two secondary side frames 34 of the animal drafting system 1, and each side framework 202 is provided with an antenna 244 for communicating with an RFID tag or device secured to the animal for reading data from the RFID tag or device including, the identity of  
15 the animal. A control circuit (not shown) in a housing 245 attached to one of the side frameworks 202 controls the operation of the pneumatic rams 240.

In use, the controlled animal access system 200 may be installed in any location where it is desired to control entry of animals from one location to another or to  
20 control exit of animals from one location to another, and in particular, where the animals are to pass in single file from one location to another. For example, the controlled animal access system 200 may be located at the entrance to a milking parlour, where the animals are required to enter the milking parlour in single file, and where it is necessary to identify each animal as it is entering the milking parlour. A  
25 sensor (not shown) is provided in an appropriate location for monitoring approaching animals, and on an animal approaching the controlled animal access system 200

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being detected, if the first closure elements 219 are in the closed state, and once the passageway 205 is free of an animal, the control circuit (not shown) in the housing 245 operates the pneumatic ram 240 to operate the first closure elements 219 from the closed state to the open state. The control circuit (not shown) in the housing 245  
5 on receiving a signal from a suitably located proximity sensor indicative of the animal having passed through the access opening 210 operates the pneumatic ram 240 to in turn operate the first closure elements 219 into the closed state, thereby preventing the next animal entering the animal accommodating passageway 205.

As the animal in the animal accommodating passageway 205 is passing

10 therethrough, data indicative of the identity and other stored data in the RFID tag or device attached to the animal is downloaded to circuitry in the housing 245 and stored.

While not illustrated in Figs. 26 and 27 it is envisaged that in some embodiments of  
15 the controlled animal access system 200, a pair of second closure elements similar to the first closure elements may be provided in the exit opening 211. In which case, the exit opening 211 would be provided with an exit frame similar to the access frame 204 which defines the access opening 210, and the exit frame would in turn define an exit opening from the animal accommodating passageway 205. The  
20 second closure elements which would be similar to the first closure elements would be pivotally mounted to upstanding stanchions of the exit frame, and would be operated by a pneumatic ram similar to the pneumatic ram 240 through a linkage mechanism. The second closure elements, typically, would remain in the closed state until the identity and other data had been read by the circuitry in the housing  
25 245 from the RFID tag or device attached to the animal, at which stage, the second closure elements would then be opened to allow passage of the animal from the

animal accommodating passageway 205.

While the main framework 3 of the animal drafting system 1 of Figs. 1 to 26 has been described as being of a specific construction, comprising side frames 5 and 6  
 5 also of specific constructions, the main framework 3 may comprise side frames of any other suitable or desired construction. Similarly, it will be appreciated that the side frameworks of the controlled animal access system 200 of Figs. 27 and 28 may also be of any other suitable or desired construction.

10 It will also be appreciated that in some embodiments of the animal drafting system and the controlled animal access system, the lower cross-members or cross-member which is secured to the ground may be omitted, and in which case, the relevant upstanding stanchions would be provided with base plates for securing the stanchions directly to the ground.

15 It will also be appreciated that in some embodiments of the animal drafting system and the controlled animal access system that the upper cross-members or cross-member, as the case may be, may be omitted.

20 While the animal drafting system has been described as comprising a pair of first gates, in some embodiments of the invention a single first gate may be provided, and in which case, the first gate would be pivotally coupled to one of the upstream stanchions, and would extend in the closed state transversely across the passageway a sufficient distance to prevent an animal gaining access to the  
 25 passageway. Similarly, in some embodiments of the animal drafting system where a pair of second gates are provided, it is envisaged that a single second gate may be

provided which would be hingedly coupled to one of the intermediate stanchions 14 and would extend transversely across the passageway a sufficient distance to prevent an animal passing from the holding section of the passageway to the drafting section thereof. However, in both cases, where a single first gate and a single second gate are provided, each gate would terminate in a free end to which a corresponding second cushioning member would be secured. It will also be appreciated that in some embodiments of the invention of the controlled animal access system, instead of providing a pair of first closure elements, a single closure element may be provided which would be similar to a single one of the first and second gates described above.

While urging and operating means for urging the drafting gates and the first and second gates between first and second states and open and closed states have been described in the animal drafting system and in the controlled animal access system, the urging and operating means may be omitted, and the relevant gates and closure elements may be manually operated. It will also be appreciated that instead of providing the urging and operating means in the animal drafting system and the controlled animal access system as pneumatic rams, the urging and operating means may be provided as hydraulic rams, and in some case, may be provided by electrically powered linear motors, or electrically powered rotary motors operating a gear rack system.

While the animal drafting system has been described as comprising a pair of drafting gates, in some embodiments of the invention it is envisaged that a single drafting gate may be provided, and in which case, it is envisaged that only one of the second and third side exits would be provided, and in which case, the drafting gate typically,

would be pivotally coupled to the main framework between the first central exit and the one of the second and third side exits.

While the cushioning members of the animal drafting system and the controlled animal access system have been described as comprising natural rubber material, the material of the cushioning members may be any suitable material, which would be flexible, and also resilient. Needless to say, while the material of the cushioning members has been described as being of a specific thickness, the thickness of the sheet of material from which the cushioning members are formed may be of any suitable thickness. Additionally, it will be appreciated that while it is desirable, it is not essential that the sheet material of the cushioning members be reinforced with fibre reinforcing material, and in some embodiments of the invention the sheet of material from which the cushioning members are formed may be reinforced with a single ply of fibre reinforcing material, or with more than two spaced apart plies.

While the bores defined by the cushioning members have been described as being of specific transverse widths, it will be appreciated that the transverse width of the bores defined by the cushioning members may be of any other suitable transverse width, and the transverse widths of the bores defined by the cushioning members may to some extent be dependent on the thickness and/or the resilience of the material of the cushioning members. It is envisaged that in some embodiments of the invention the transverse width of the bores of the cushioning members of the drafting elements may range from 25mm to 200mm, although, in general, it is believed to be preferable that the transverse width of the bores of the cushioning members of the drafting elements would lie in the range of 75mm to 150mm. It is also envisaged that in some embodiments of the invention the bores of the

cushioning members of the closure elements may be of transverse width in the range of 25mm to 200mm, although, in general, it is believed preferable that the transverse width of the bores of the cushioning members of the closure elements would lie in the range of 50mm to 150mm.

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Additionally, while the bores defined by the cushioning members have been described as being of specific transverse lengths, extending outwardly from the corresponding drafting element or the corresponding closure element, it will be appreciated that the transverse lengths of the bores defined by the cushioning

10 members may be of any other suitable transverse length, and the transverse lengths of the bores defined by the cushioning members may be to some extent dependent on the thickness and/or the resilience of the material of the cushioning members.

Additionally, it is envisaged that the transverse length of the bores of the cushioning members of the drafting elements may lie in the range of 25mm to 400mm, although,

15 in general, it is believed to be preferable that the transverse lengths of the bores of the cushioning members of the drafting elements should lie in the range of 100mm to 250mm. Additionally, it is envisaged that the transverse lengths of the bores of the cushioning elements of the closure elements extending outwardly from the corresponding closure element may in some embodiments of the invention lie in the

20 range of 25mm to 400mm, although, in general, it is believed preferable that the transverse length of the bores of the cushioning members of the closure elements should lie in the range of 100mm to 300mm.

Additionally, while the cushioning members have been described as being formed

25 from a single sheet of material folded to partly or wholly form the bore extending through the cushioning member, in some embodiments of the invention it is

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envisaged that the cushioning members may be formed from an elongated tubular member of a suitable resiliently deformable material. In which case, it is envisaged that the tubular member would be secured to the free end of the corresponding drafting gate by suitable mechanical fixings extending through the wall of the tubular member from the bore thereof, or alternatively, the tubular member forming the cushioning member may be secured to the corresponding drafting gate adjacent the free end thereof with a portion of the wall of the tubular member pinched by mechanical fixings securing the cushioning member to the drafting gate. Similarly, such cushioning members may also be used in conjunction with the first and second gates of the animal drafting system, and the first closure element of the controlled animal access system.

While the first and second gates of the animal drafting system and the first closure element of the controlled animal access system have been described as comprising respective plate members, the plate members may be replaced with suitable frames or frameworks.

While the drafting gates of the animal drafting system have been described as extending in a generally upstream direction from the pivot axis thereof, in some embodiments of the invention it is envisaged that the drafting gates may extend in a generally downstream direction from their respective pivot axes.

The invention is not limited to the embodiments hereinbefore described which may be varied in construction and detail.

### Claims

1. An animal drafting system comprising a framework defining an animal accommodating passageway extending therethrough from an upstream end defining an animal accommodating entrance to the passageway and terminating in a downstream end, the downstream end defining at least an animal accommodating first exit from the passageway and an animal accommodating second exit from the passageway, at least one drafting element hingedly coupled to the framework about a hinge axis, and being hingeable about the hinge axis between a first state permitting egress from the passageway through the first exit and preventing egress from the passageway through the second exit, and a second state preventing egress from the passageway through the first exit, and permitting egress from the passageway through the second exit, the drafting element extending from the hinge axis to a free end thereof, and an elongated resiliently deformable first cushioning member extending along and outwardly from the free end of the drafting element and defining an elongated bore extending therethrough.
2. An animal drafting system as claimed in Claim 1 in which the first exit defines a first exit opening for accommodating an animal therethrough, the first exit opening defining a plane extending substantially transversely of the passageway.
3. An animal drafting system as claimed in Claim 1 or 2 in which the first exit is longitudinally aligned with the passageway.
4. An animal drafting system as claimed in any preceding claim in which the passageway terminates in the first exit.

5. An animal drafting system as claimed in any preceding claim in which the second exit is located to one side of the passageway.

6. An animal drafting system as claimed in any preceding claim in which the drafting element is hingedly coupled to the framework adjacent the side of the passageway from which the second exit is located.

7. An animal drafting system as claimed in any preceding claim in which the drafting element is hingedly coupled to the framework adjacent the downstream end thereof.

8. An animal drafting system as claimed in any preceding claim in which the drafting element is hingedly coupled to the framework between the first and second exits.

15

9. An animal drafting system as claimed in any preceding claim in which an animal accommodating third exit from the passageway is located adjacent the downstream end thereof, the third exit being located on the opposite side of the passageway to the side on which the second exit is located, and two of the drafting elements are provided, a second one of the two drafting elements being hingedly coupled to the framework about a corresponding hinge axis and being hingeable between the first state thereof for permitting egress from the passageway through the first exit and preventing egress from the passageway through the third exit, and the second state for preventing egress from the passageway through the first exit, and permitting egress from the passageway through the third exit.

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10. An animal drafting system as claimed in Claim 9 in which the second one of the drafting elements is hingedly coupled to the framework between the first and third exits.

5 11. An animal drafting system as claimed in any preceding claim in which an urging means is provided corresponding to each drafting element for urging the corresponding drafting element between the first and second states thereof.

10 12. An animal drafting system as claimed in any preceding claim in which each hinge axis extends substantially vertically.

13. An animal drafting system as claimed in any preceding claim in which each drafting element extends in an upstream direction from the hinge axis thereof substantially parallel to the passageway in the first state thereof closing the  
15 corresponding one of the second and third exits.

14. An animal drafting system as claimed in any preceding claim in which each drafting element in the second state thereof extends generally across the passageway at an angle to the passageway greater than zero.

20

15. An animal drafting system as claimed in Claim 14 in which each drafting element in the second state thereof extends across the passageway at an angle to the passageway in the range of 10° to 45°.

25 16. An animal drafting system as claimed in Claim 14 or 15 in which each drafting element in the second state thereof extends across the passageway at an

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angle to the passageway of approximately 20°.

17. An animal drafting system as claimed in any preceding claim in which the bore extending through each first cushioning member defines a corresponding  
5 central axis extending therethrough and extending substantially parallel to the hinge axis of the corresponding drafting element.

18. An animal drafting system as claimed in any preceding claim in which each first cushioning member comprises an elongated sheet of material folded to form the  
10 first cushioning member, and to define at least a part of the corresponding bore extending therethrough.

19. An animal drafting system as claimed in Claim 18 in which the folded sheet of material forming each first cushioning member defines with the free end of the  
15 corresponding drafting element the elongated bore.

20. An animal drafting system as claimed in Claim 18 or 19 in which the folded sheet of material forming each first cushioning member defines a pair of opposite elongated side portions extending parallel to the central axis of the bore of the  
20 corresponding first cushioning member, the side portions of the first cushioning member being secured to the corresponding drafting element adjacent the free end thereof.

21. An animal drafting system as claimed in Claim 20 in which the side portions  
25 of the first cushioning member are secured to the corresponding drafting element with the free end of the drafting element sandwiched between the side portions of

the first cushioning member.

22. An animal drafting system as claimed in any of Claims 18 to 21 in which the sheet of material forming each first cushioning member comprises a flexible material.

5

23. An animal drafting system as claimed in any of Claims 18 to 22 in which the sheet of material forming each first cushioning member comprises a resiliently deformable material.

10 24. An animal drafting system as claimed in any of Claims 18 to 23 in which the sheet of material forming each first cushioning member comprises a sheet of material reinforced with a fibre material.

25. An animal drafting system as claimed in any of Claims 18 to 24 in which the  
15 sheet of material forming each first cushioning member comprises at least a single ply of fibre reinforcing material.

26. An animal drafting system as claimed in any of Claims 18 to 25 in which the  
20 sheet of material forming each first cushioning member comprises at least two spaced apart plies of fibre reinforcing material.

27. An animal drafting system as claimed in any of Claims 18 to 26 in which the sheet of material forming each first cushioning member is of thickness in the range of 4mm to 15mm.

25

28. An animal drafting system as claimed in any of Claims 18 to 27 in which the

sheet of material forming each first cushioning member is of thickness in the range of 6mm to 12mm.

29. An animal drafting system as claimed in any of Claims 18 to 28 in which the  
5 sheet of material forming each first cushioning member is of thickness of approximately 8mm.

30. An animal drafting system as claimed in any preceding claim in which the  
maximum transverse width of the bore defined by each first cushioning member in a  
10 transverse direction relative to the corresponding drafting element lies in the range of 25mm to 200mm.

31. An animal drafting system as claimed in any preceding claim in which the  
maximum transverse width of the bore defined by each first cushioning member in a  
15 transverse direction relative to the corresponding drafting element lies in the range of 75mm to 150mm.

32. An animal drafting system as claimed in any preceding claim in which the  
maximum transverse width of the bore defined by each first cushioning member in a  
20 transverse direction relative to the corresponding drafting element is approximately 115mm.

33. An animal drafting system as claimed in any preceding claim in which the  
maximum transverse length of the bore defined by each first cushioning member  
25 extending outwardly from the free end of the corresponding drafting element lies in the range of 25mm to 400mm.

34. An animal drafting system as claimed in any preceding claim in which the maximum transverse length of the bore defined by each first cushioning member extending outwardly from the free end of the corresponding drafting element lies in the range of 100mm to 250mm.

5

35. An animal drafting system as claimed in any preceding claim in which the maximum transverse length of the bore defined by each first cushioning member extending outwardly from the free end of the corresponding drafting element is approximately 160mm.

10

36. An animal drafting system as claimed in any preceding claim in which each first cushioning member comprises one of a rubber material, a synthetic rubber material and a plastics material.

15 37. An animal drafting system as claimed in any preceding claim in which each first cushioning member comprises a natural rubber material.

38. An animal drafting system as claimed in any preceding claim in which each first cushioning member is secured to the free end of the corresponding drafting  
20 element by a mechanical fixing means.

39. An animal drafting system as claimed in any preceding claim in which at least one first closure element is pivotally coupled to the framework about a first pivot axis, and is pivotal between a closed state preventing access to the passageway through  
25 the animal accommodating entrance thereto, and an open state permitting access to the passageway through the animal accommodating entrance, the first closure

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element extending from the first pivot axis to a free end thereof, and the first closure element comprising an elongated resiliently deformable second cushioning member extending along and outwardly from the free end of the first closure element, the second cushioning member at least partly defining an elongated bore extending  
5 therethrough.

40. An animal drafting system as claimed in Claim 39 in which a pair of the first closure elements are provided, the first closure elements being pivotally coupled about the respective first pivot axes to the framework adjacent respective opposite  
10 sides of the passageway, and cooperating with each other in the closed states thereof to prevent access to the passageway through the animal accommodating entrance.

41. An animal drafting system as claimed in Claim 39 or 40 in which a first  
15 operating means is provided for operating the first closure elements between the closed state and the open state.

42. An animal drafting system as claimed in any of Claims 39 to 41 in which each first closure element in the open state thereof extends parallel to the passageway,  
20 and in the closed state thereof extends substantially transversely of the passageway.

43. An animal drafting system as claimed in any of Claims 39 to 42 in which at least one second closure element is located in the passageway intermediate the first closure element and the drafting element, the second closure element being pivotally  
25 coupled to the framework about a second pivot axis, and being pivotal about the second pivot axis between a closed state preventing passage of an animal through

the passageway, and an open state permitting passage of an animal through the passageway, the second closure element extending from the second pivot axis to a free end thereof, and the second closure element comprising one of the elongated resiliently deformable second cushioning members extending along and outwardly from the free end of the second closure element.

44. An animal drafting system as claimed in Claim 43 in which a pair of the second closure elements are provided, the second closure elements being pivotally coupled about the respective second pivot axes to the framework adjacent respective opposite sides of the passageway, and cooperating with each other in the closed state thereof to prevent passage of an animal through the passageway.

45. An animal drafting system as claimed in Claim 43 or 44 in which each second closure element is located adjacent the second exit but upstream thereof.

46. An animal drafting system as claimed in any of Claims 43 to 45 in which a second operating means is provided for operating the second closure element between the closed state and the open state.

47. An animal drafting system as claimed in any of Claims 43 to 46 in which each second closure element in the open state thereof extends parallel to the passageway, and in the closed state thereof extends substantially transversely of the passageway.

48. An animal drafting system as claimed in any of Claims 39 to 47 in which the bore extending through each second cushioning member defines a corresponding

central axis extending therethrough and extending substantially parallel to the corresponding one of the first and second pivot axes.

49. An animal drafting system as claimed in any of Claims 39 to 48 in which each second cushioning member comprises an elongated sheet of material folded to form the second cushioning member and to define the corresponding bore extending therethrough.

50. An animal drafting system as claimed in Claim 49 in which the folded sheet of material forming each second cushioning member defines a pair of opposite elongated side portions extending parallel to the central axis thereof, the side portions of the corresponding second cushioning member being secured to the corresponding one of the first and second closure elements adjacent the free end thereof.

51. An animal drafting system as claimed in Claim 50 in which the side portions of each second cushioning member are secured together to define the bore extending through the second cushioning member.

52. An animal drafting system as claimed in any of Claims 49 to 51 in which the sheet of material forming each second cushioning member comprises a flexible material.

53. An animal drafting system as claimed in any of Claims 49 to 52 in which the sheet of material forming each second cushioning member comprises a resiliently deformable material.

54. An animal drafting system as claimed in any of Claims 49 to 53 in which the sheet of material forming each second cushioning member comprises a sheet of material reinforced with a fibre material.

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55. An animal drafting system as claimed in any of Claims 49 to 54 in which the sheet of material forming each second cushioning member comprises at least a single ply of fibre reinforcing material.

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56. An animal drafting system as claimed in any of Claims 49 to 55 in which the sheet of material forming each second cushioning member comprises at least two spaced apart plies of fibre reinforcing material.

15

57. An animal drafting system as claimed in any of Claims 49 to 56 in which the sheet of material forming each second cushioning member is of thickness in the range of 4mm to 15mm.

20

58. An animal drafting system as claimed in any of Claims 49 to 57 in which the sheet of material forming each second cushioning member is of thickness in the range of 6mm to 12mm.

25

59. An animal drafting system as claimed in any of Claims 49 to 58 in which the sheet of material forming each second cushioning member is of thickness of approximately 8mm.

60. An animal drafting system as claimed in any of Claims 39 to 59 in which the

maximum transverse width of the bore defined by each second cushioning member in a transverse direction relative to the corresponding one of the first and second closure elements lies in the range of 25mm to 200mm.

- 5     61.     An animal drafting system as claimed in any of Claims 39 to 60 in which the maximum transverse width of the bore defined by each second cushioning member in a transverse direction relative to the corresponding one of the first and second closure elements lies in the range of 50mm to 150mm.

- 10    62.     An animal drafting system as claimed in any of Claims 39 to 61 in which the maximum transverse width of the bore defined by each second cushioning member in a transverse direction relative to the corresponding one of the first and second closure elements is approximately 80mm.

- 15    63.     An animal drafting system as claimed in any of Claims 39 to 62 in which the maximum transverse length of the bore defined by each second cushioning element extending outwardly from the free end of the corresponding one of the first and second closure elements lies in the range of 25mm to 400mm.

- 20    64.     An animal drafting system as claimed in any of Claims 39 to 63 in which the maximum transverse length of the bore defined by each second cushioning element extending outwardly from the free end of the corresponding one of the first and second closure elements lies in the range of 100mm to 300mm.

- 25    65.     An animal drafting system as claimed in any of Claims 39 to 64 in which the maximum transverse length of the bore defined by each second cushioning element

extending outwardly from the free end of the corresponding one of the first and second closure elements is approximately 180mm.

66. An animal drafting system as claimed in any of Claims 39 to 65 in which each second cushioning member comprises one of a rubber material, synthetic rubber material, and a plastics material.

67. An animal drafting system as claimed in any of Claims 39 to 66 in which each second cushioning member comprises a natural rubber material.

68. An animal drafting system as claimed in any of Claims 39 to 67 in which each second cushioning member is secured to the corresponding one of the first and second closure elements by mechanical fixing means.

69. An animal drafting system as claimed in any of Claims 39 to 68 in which each of the first and second pivot axes extend substantially vertically.

70. A controlled animal access system defining an animal accommodating entrance adapted to accommodate an animal therethrough, and comprising a first closure element located in the animal accommodating entrance and pivotal about a first pivot axis between a closed state closing the animal accommodating entrance and an open state for permitted access to an animal through the animal accommodating entrance, the first closure element extending from the first pivot axis to a free end thereof, and an elongated resiliently deformable cushioning member extending along and outwardly from the free end of the first closure element, the cushioning member at least partly defining an elongated bore extending

therethrough.

71. A controlled animal access system as claimed in Claim 70 in which a pair of first closure elements are located in the animal accommodating entrance, the first closure elements being pivotal about respective ones of the first pivot axes located adjacent respective opposite sides of the animal accommodating entrance, and in the closed state the first closure elements extend from the respective first corresponding pivot axes towards each other with the respective first closure elements adjacent but slightly spaced apart from each other.

72. A controlled animal access system as claimed in Claim 70 or 71 in which an animal accommodating passageway is defined extending from the animal accommodating entrance.

73. A controlled animal access system as claimed in Claim 72 in which the passageway is defined by a pair of spaced apart side walls extending from the animal accommodating entrance.

74. A controlled animal access system as claimed in Claim 72 or 73 in which the passageway terminates in an animal accommodating exit, and a second closure element is located in the animal accommodating exit and is pivotal about a second pivot axis between a closed state closing the animal accommodating exit, and an open state for permitting egress of an animal through the animal accommodating exit, the second closure element extending from the second pivot axis to a free end thereof, and the second closure element comprising one of the elongated resiliently deformable cushioning members extending along and outwardly from the free end of

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the second closure element.

75. A controlled animal access system as claimed in Claim 74 in which a pair of second closure elements are located in the animal accommodating exit, the second closure elements being pivotal about respective ones of the second pivot axes located adjacent respective opposite sides of the animal accommodating exit, and in the closed state the second closure elements extend from the respective corresponding second pivot axes towards each other with the respective second closure elements adjacent but slightly spaced apart from each other.

76. A controlled animal access system as claimed in any of Claims 72 to 75 in which a communicating means is located adjacent the animal accommodating passageway for communicating with an RFID tag or device secured on an animal for reading a signal indicative of the identity of an animal located in the passageway from the RFID tag or device secured to the animal.

77. A controlled animal access system as claimed in any of Claims 70 to 76 in which the bore extending through each cushioning member defines a central axis extending therethrough and extending substantially parallel to the one of the first and second pivot axes of the corresponding one of the first and second closure elements.

78. A controlled animal access system as claimed in any of Claims 70 to 77 in which each cushioning member comprises an elongated sheet of material folded to form the corresponding cushioning member and to define the bore extending therethrough.

79. A controlled animal access system as claimed in Claim 78 in which the folded sheet of material forming each cushioning member defines a pair of opposite elongated side portions extending parallel to the central axis thereof, the side portions of the corresponding cushioning member being secured to the corresponding one of the first and second closure elements adjacent the free end thereof.

80. A controlled animal access system as claimed in Claim 79 in which the side portions of each cushioning member are secured together to define the bore extending through the cushioning member.

81. A controlled animal access system as claimed in any of Claims 78 to 80 in which the sheet of material forming each cushioning member comprises a flexible material.

82. A controlled animal access system as claimed in any of Claims 78 to 81 in which the sheet of material forming each cushioning member comprises a resiliently deformable material.

83. A controlled animal access system as claimed in any of Claims 78 to 82 in which the sheet of material forming each cushioning member comprises a sheet of material reinforced with a fibre material.

84. A controlled animal access system as claimed in any of Claims 78 to 83 in which the sheet of material forming each cushioning member comprises at least a

single ply of fibre reinforcing material.

85. A controlled animal access system as claimed in any of Claims 78 to 84 in which the sheet of material forming each cushioning member comprises at least two spaced apart plies of fibre reinforcing material.

86. A controlled animal access system as claimed in any of Claims 78 to 85 in which the sheet of material forming each cushioning member is of thickness in the range of 4mm to 15mm.

87. A controlled animal access system as claimed in any of Claims 78 to 80 in which the sheet of material forming each cushioning member is of thickness in the range of 6mm to 12mm.

88. A controlled animal access system as claimed in any of Claims 78 to 87 in which the sheet of material forming each cushioning member is of thickness of approximately 8mm.

89. A controlled animal access system as claimed in any of Claims 70 to 88 in which the maximum transverse width of the bore defined by each cushioning member in a transverse direction relative to the corresponding closure element lies in the range of 25mm to 200mm.

90. A controlled animal access system as claimed in any of Claims 70 to 89 in which the maximum transverse width of the bore defined by each cushioning member in a transverse direction relative to the corresponding closure element lies

in the range of 50mm to 150mm.

91. A controlled animal access system as claimed in any of Claims 70 to 90 in which the maximum transverse width of the bore defined by each cushioning member in a transverse direction relative to the corresponding closure element is approximately 80mm.

92. A controlled animal access system as claimed in any of Claims 70 to 91 in which the maximum transverse length of the bore defined by each cushioning member extending outwardly from the free end of the corresponding closure element lies in the range of 25mm to 400mm.

93. A controlled animal access system as claimed in any of Claims 70 to 92 in which the maximum transverse length of the bore defined by each cushioning member extending outwardly from the free end of the corresponding closure element lies in the range of 100mm to 300mm.

94. A controlled animal access system as claimed in any of Claims 70 to 93 in which the maximum transverse length of the bore defined by each cushioning member extending outwardly from the free end of the corresponding closure element is approximately 180mm.

95. A controlled animal access system as claimed in any of Claims 70 to 91 in which each cushioning member comprises one of a rubber material or synthetic rubber material and a plastics material.

96. A controlled animal access system as claimed in any of Claims 70 to 95 in which each cushioning member comprises a natural rubber material.

97. A controlled animal access system as claimed in any of Claims 70 to 96 in which each cushioning member is secured to the corresponding one of the first and second closure elements by mechanical fixing means.

98. A drafting element adapted for hingedly coupling to a framework of an animal drafting system about a hinge axis, the drafting element extending from the hinge axis to a free end thereof, and comprising an elongated resiliently deformable cushioning member extending along and outwardly from the free end of the drafting element, the cushioning member at least partly defining an elongated bore extending therethrough.

99. A drafting element as claimed in Claim 98 in which the bore extending through the cushioning member defines a central axis extending therethrough and extending substantially parallel to the hinge axis of the drafting element.

100. A drafting element as claimed in Claim 98 or 99 in which the cushioning member comprises an elongated sheet of material folded to form the cushioning member and to define at least a part of the bore extending therethrough.

101. A drafting element as claimed in Claim 100 in which the folded sheet of material forming the cushioning member defines with the free end of the drafting element the elongated bore.

102. A drafting element as claimed in Claim 100 or 101 in which the folded sheet of material forming the cushioning member defines a pair of opposite elongated side portions extending parallel to the central axis of the bore of the cushioning member, the side portions of the cushioning member being secured to the drafting element  
5 adjacent the free end thereof.

103. A drafting element as claimed in any of Claims 100 to 102 in which the sheet of material forming the cushioning member comprises a flexible material.

104. A drafting element as claimed in any of Claims 100 to 103 in which the sheet of material forming the cushioning member comprises a resiliently deformable material.  
10

105. A drafting element as claimed in any of Claims 100 to 104 in which the sheet of material forming the cushioning member comprises a sheet of material reinforced with a fibre material.  
15

106. A drafting element as claimed in any of Claims 100 to 105 in which the sheet of material forming the cushioning member comprises at least a single ply of fibre  
20 reinforcing material.

107. A drafting element as claimed in any of Claims 100 to 106 in which the sheet of material forming the cushioning member comprises at least two spaced apart plies of fibre reinforcing material.  
25

108. A drafting element as claimed in any of Claims 100 to 107 in which the sheet

of material forming the cushioning member is of thickness in the range of 4mm to 15mm.

109. A drafting element as claimed in any of Claims 100 to 108 in which the sheet  
5 of material forming the cushioning member is of thickness in the range of 6mm to 12mm.

110. A drafting element as claimed in any of Claims 100 to 109 in which the sheet  
of material forming the cushioning member is of thickness of approximately 8mm.

10  
111. A drafting element as claimed in any of Claims 98 to 110 in which the  
maximum transverse width of the bore defined by the cushioning member in a  
transverse direction relative to the drafting element lies in the range of 25mm to  
200mm.

15  
112. A drafting element as claimed in any of Claims 98 to 111 in which the  
maximum transverse width of the bore defined by the cushioning member in a  
transverse direction relative to the drafting element lies in the range of 75mm to  
150mm.

20  
113. A drafting element as claimed in any of Claims 98 to 112 in which the  
maximum transverse width of the bore defined by the cushioning member in a  
transverse direction relative to the drafting element is approximately 115mm.

25  
114. A drafting element as claimed in any of Claims 98 to 113 in which the  
maximum transverse length of the bore defined by the cushioning member extending

outwardly from the free end of the drafting element lies in the range of 25mm to 400mm.

115. A drafting element as claimed in any of Claims 98 to 114 in which the  
5 maximum transverse length of the bore defined by the cushioning member extending outwardly from the free end of the drafting element lies in the range of 100mm to 250mm.

116. A drafting element as claimed in any of Claims 98 to 115 in which the  
10 maximum transverse length of the bore defined by the cushioning member extending outwardly from the free end of the drafting element is approximately 160mm.

117. A drafting element as claimed in any of Claims 98 to 116 in which the  
cushioning member comprises one of a rubber material, a synthetic rubber material  
15 and a plastics material.

118. A drafting element as claimed in any of Claims 98 to 117 in which the  
cushioning member comprises a natural rubber material.

20 119. A drafting element as claimed in any of Claims 98 to 118 in which the cushioning member is secured to the free end of the drafting element by a mechanical fixing means.

120. A drafting element as claimed in any of Claims 98 to 119 in which the drafting  
25 element comprises a gate.

121. A closure element adapted for closing an animal accommodating entrance, the closure element being pivotal about a pivot axis and extending from the pivot axis to a free end thereof, and comprising an elongated resiliently deformable cushioning member extending along and outwardly from the free end of the closure element, the cushioning member at least partly defining an elongated bore extending therethrough.

122. A closure element as claimed in Claim 121 in which the bore extending through the cushioning member defines a central axis extending therethrough and extending substantially parallel to the pivot axis of the closure element.

123. A closure element as claimed in Claim 121 or 122 in which the cushioning member comprises an elongated sheet of material folded to form the cushioning member and to define at least a part of the bore extending therethrough.

124. A closure element as claimed in Claim 123 in which the folded sheet of material forming the cushioning member defines a pair of opposite elongated side portions extending parallel to the central axis of the bore of the cushioning member, the side portions of the cushioning member being secured to the closure element adjacent the free end thereof.

125. A closure element as claimed in Claim 123 or 124 in which the side portions of the cushioning member are secured together.

126. A closure element as claimed in any of Claims 123 to 125 in which the sheet of material forming the cushioning member comprises a flexible material.

127. A closure element as claimed in any of Claims 123 to 126 in which the sheet of material forming the cushioning member comprises a resiliently deformable material.

5

128. A closure element as claimed in any of Claims 123 to 127 in which the sheet of material forming the cushioning member comprises a sheet of material reinforced with a fibre material.

10

129. A closure element as claimed in any of Claims 123 to 128 in which the sheet of material forming the cushioning member comprises at least a single ply of fibre reinforcing material.

15

130. A closure element as claimed in any of Claims 123 to 129 in which the sheet of material forming the cushioning member comprises at least two spaced apart plies of fibre reinforcing material.

20

131. A closure element as claimed in any of Claims 123 to 130 in which the sheet of material forming the cushioning member is of thickness in the range of 4mm to 15mm.

25

132. A closure element as claimed in any of Claims 123 to 131 in which the sheet of material forming the cushioning member is of thickness in the range of 6mm to 12mm.

133. A closure element as claimed in any of Claims 123 to 132 in which the sheet

of material forming the cushioning member is of thickness of approximately 8mm.

134. A closure element as claimed in any of Claims 121 to 133 in which the maximum transverse width of the bore defined by the cushioning member in a transverse direction relative to the closure element lies in the range of 25mm to 200mm.

135. A closure element as claimed in any of Claims 121 to 134 in which the maximum transverse width of the bore defined by the cushioning member in a transverse direction relative to the closure element lies in the range of 50mm to 150mm.

136. A closure element as claimed in any of Claims 121 to 135 in which the maximum transverse width of the bore defined by the cushioning member in a transverse direction relative to the closure element is approximately 80mm.

137. A closure element as claimed in any of Claims 121 to 136 in which the maximum transverse length of the bore defined by the cushioning member extending outwardly from the free end of the closure element lies in the range of 25mm to 400mm.

138. A closure element as claimed in any of Claims 121 to 137 in which the maximum transverse length of the bore defined by the cushioning member extending outwardly from the free end of the closure element lies in the range of 100mm to 300mm.

139. A closure element as claimed in any of Claims 121 to 138 in which the maximum transverse length of the bore defined by the cushioning member extending outwardly from the free end of the closure element is approximately 180mm.

5 140. A closure element as claimed in any of Claims 121 to 139 in which the cushioning member comprises one of a rubber material, a synthetic rubber material and a plastics material.

10 141. A closure element as claimed in any of Claims 121 to 140 in which the cushioning member comprises a natural rubber material.

142. A closure element as claimed in any of Claims 121 to 141 in which the cushioning member is secured to the free end of the closure element by a mechanical fixing means.

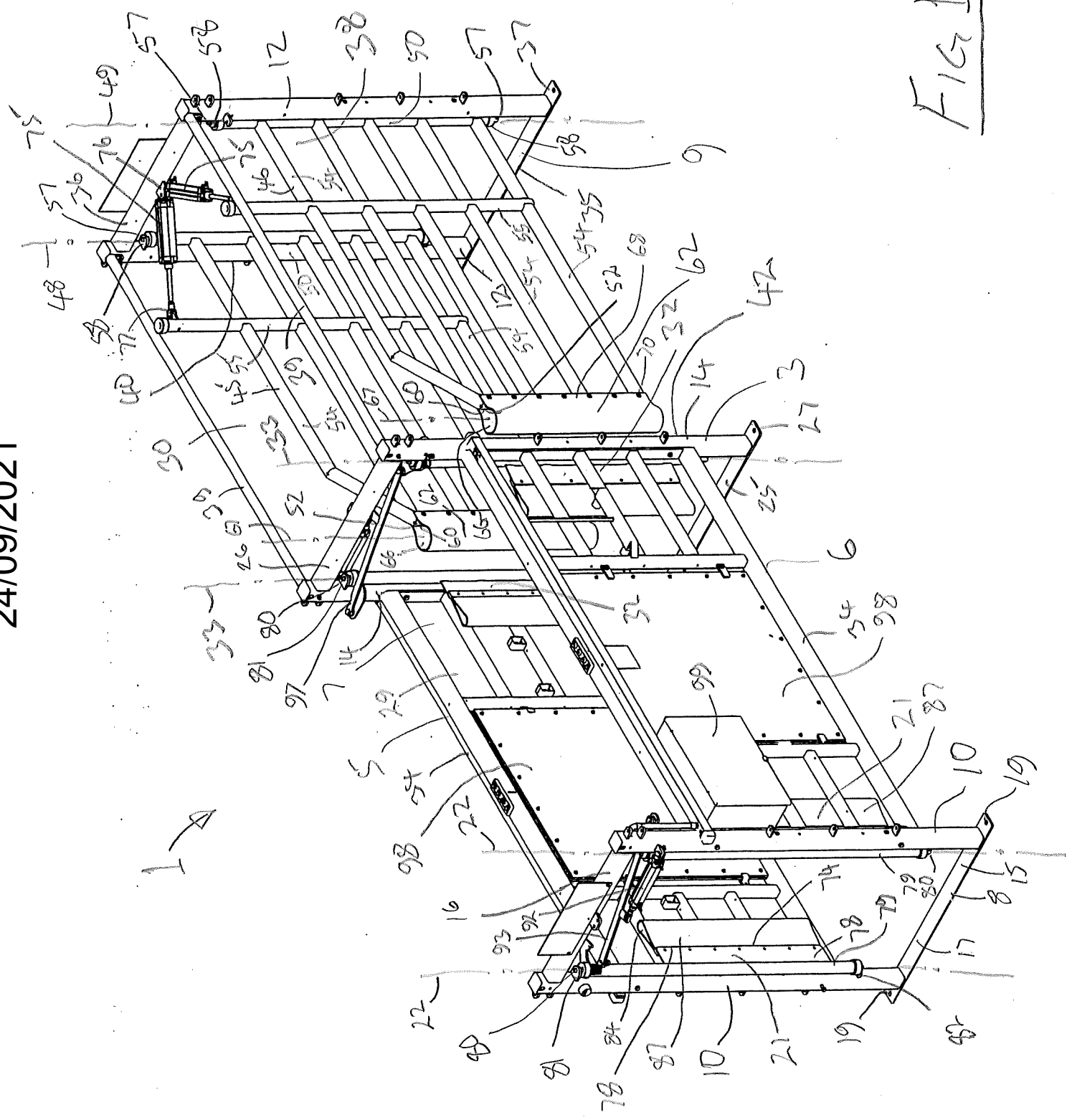
15

143. A closure element as claimed in any of Claims 121 to 142 in which the closure element comprises a plate member.

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Fig 1



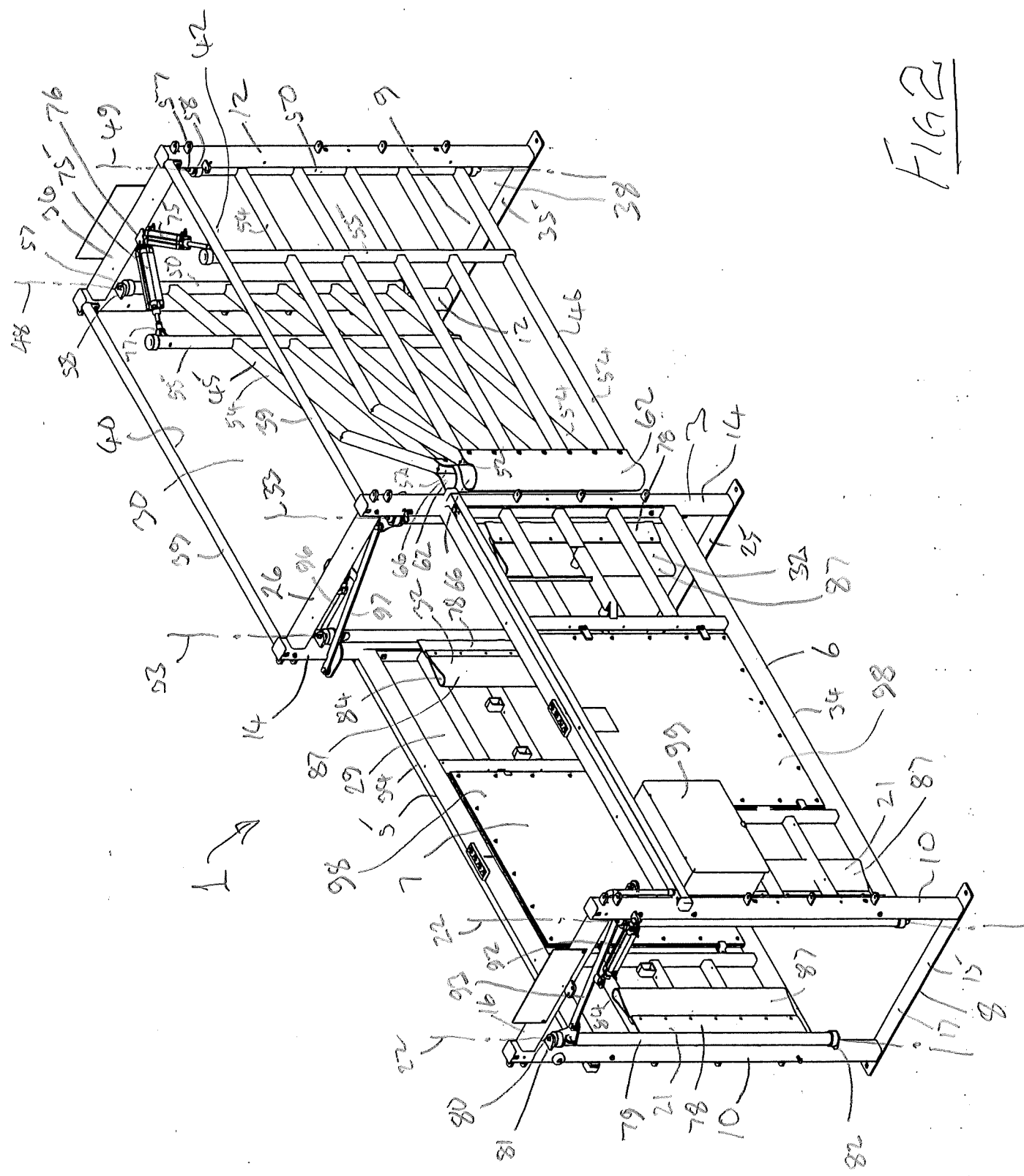


Fig 2

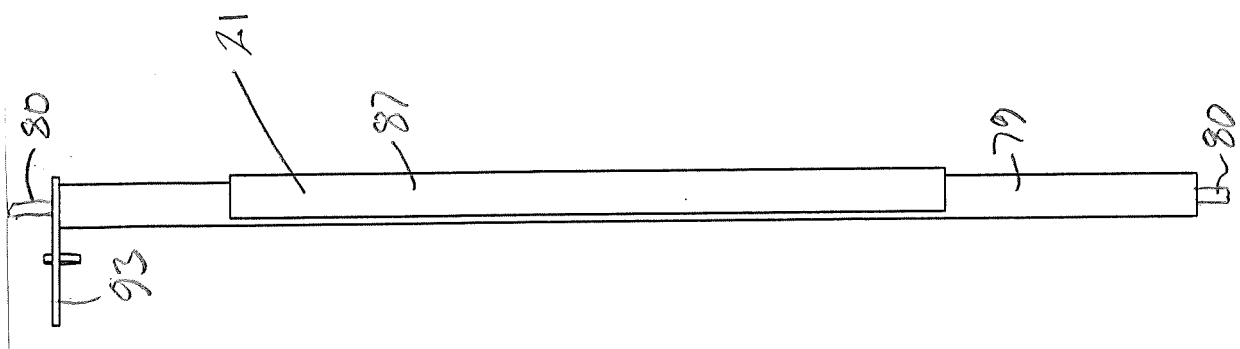


Fig 20

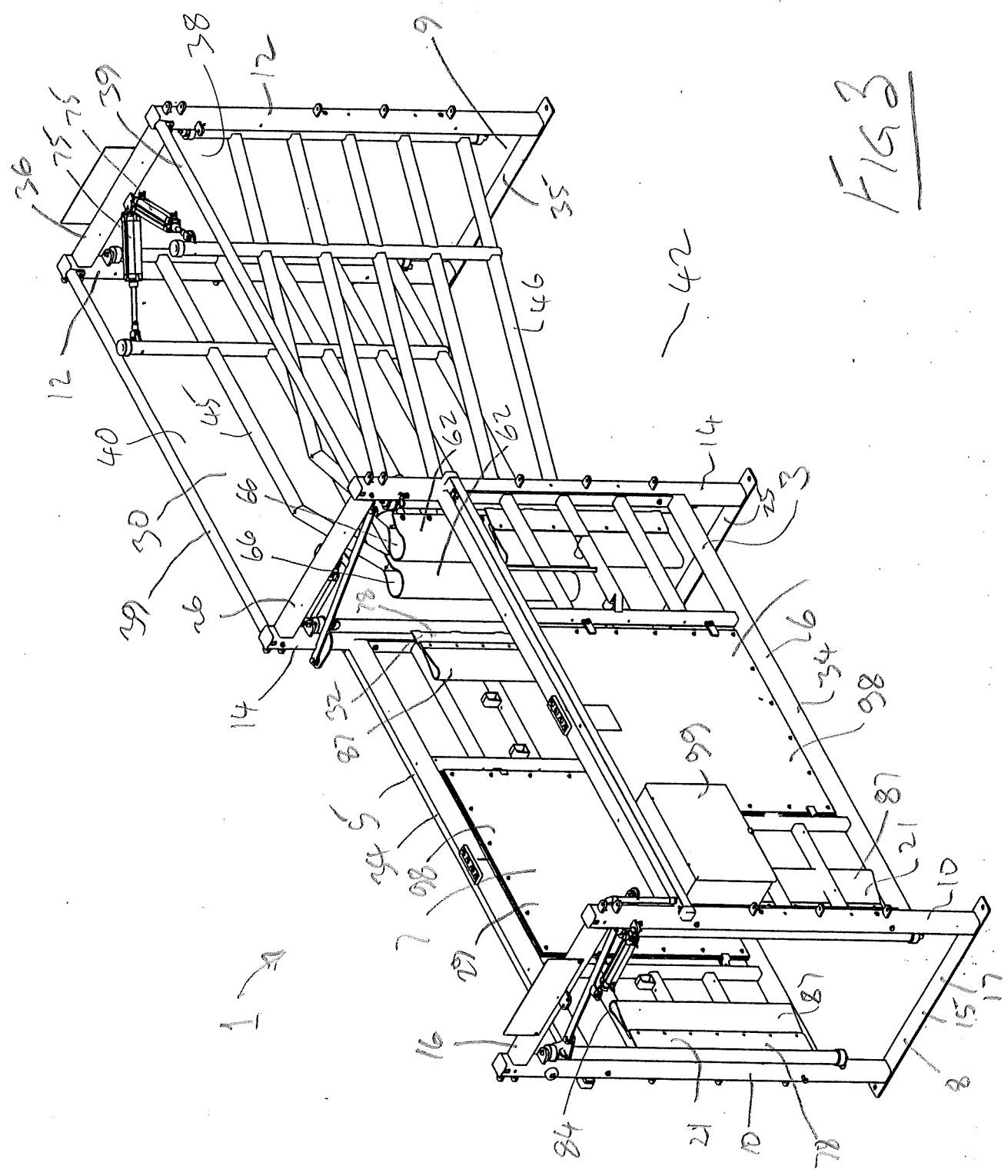
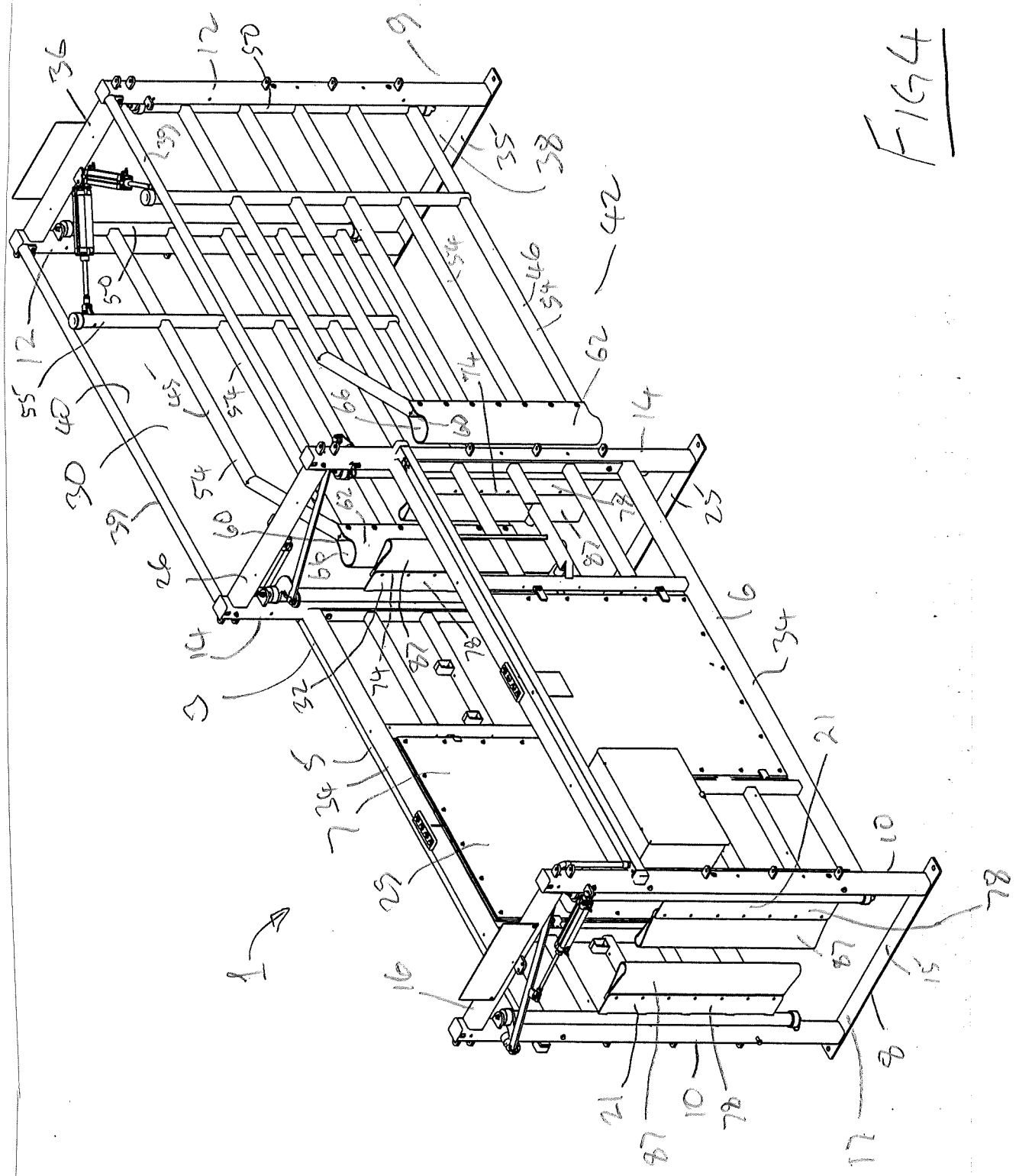


Fig 21

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FIG 4



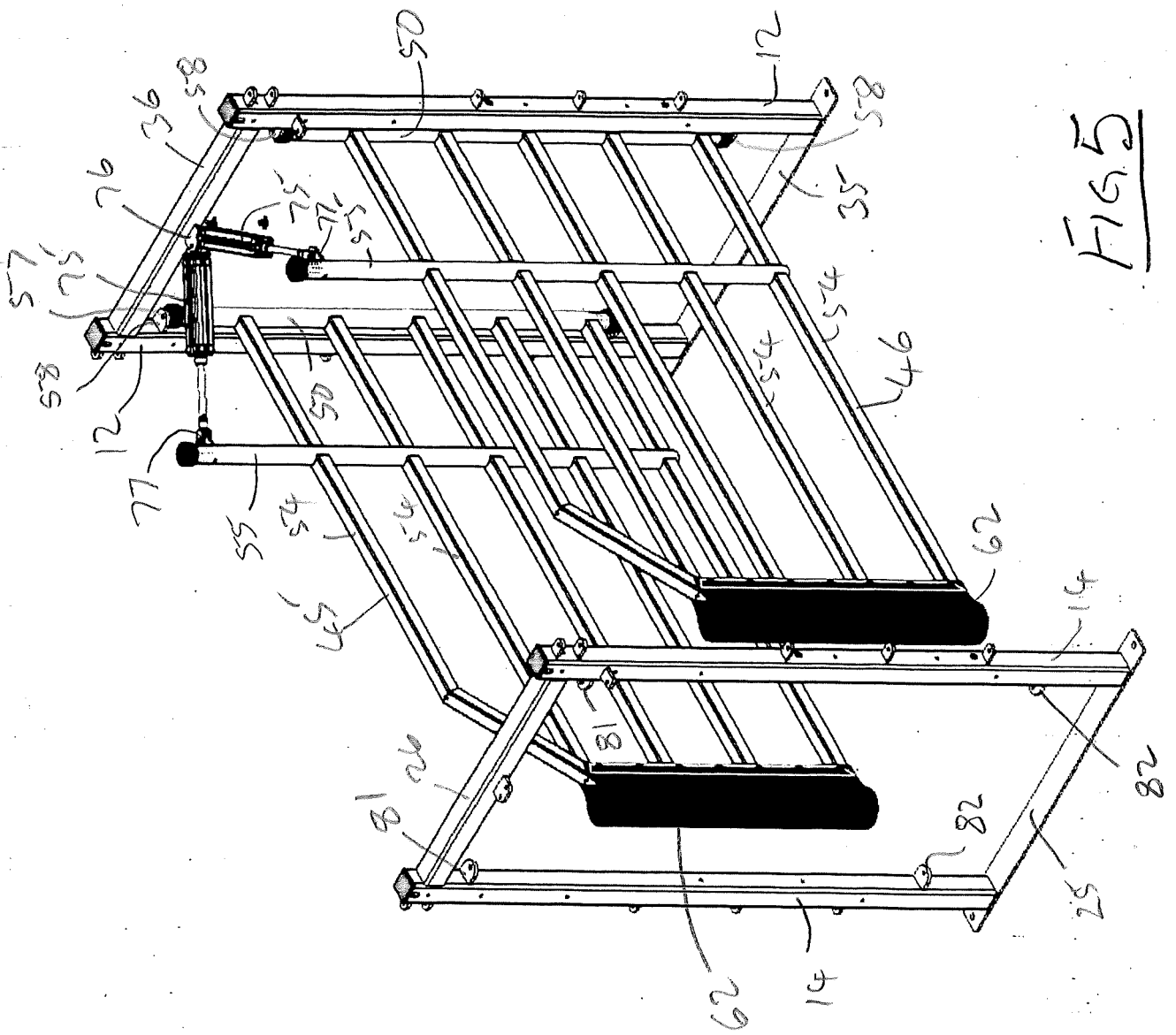


Fig 5

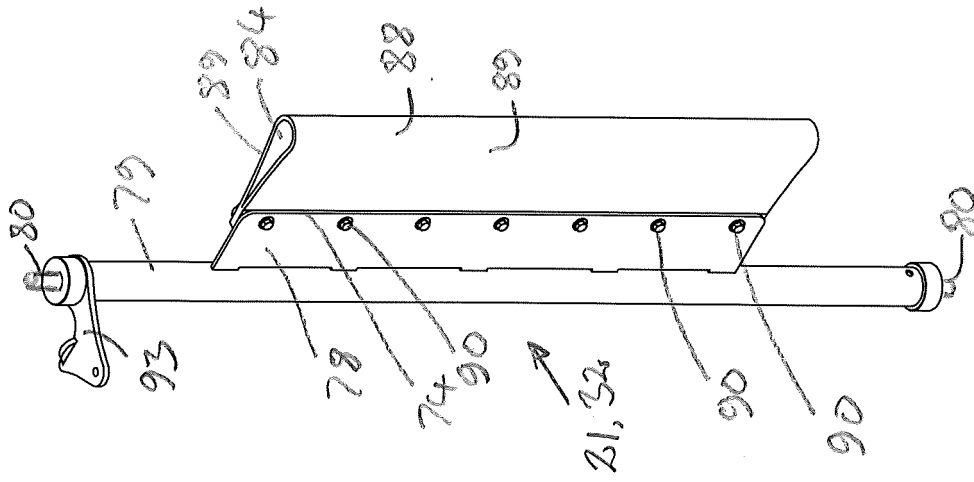


Fig 18

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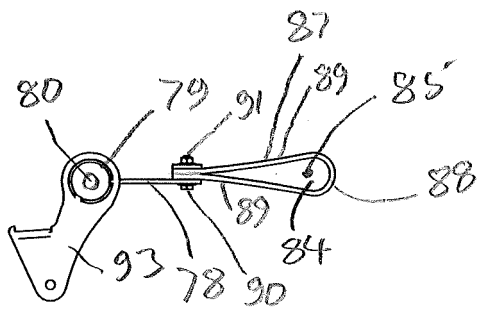


FIG 21

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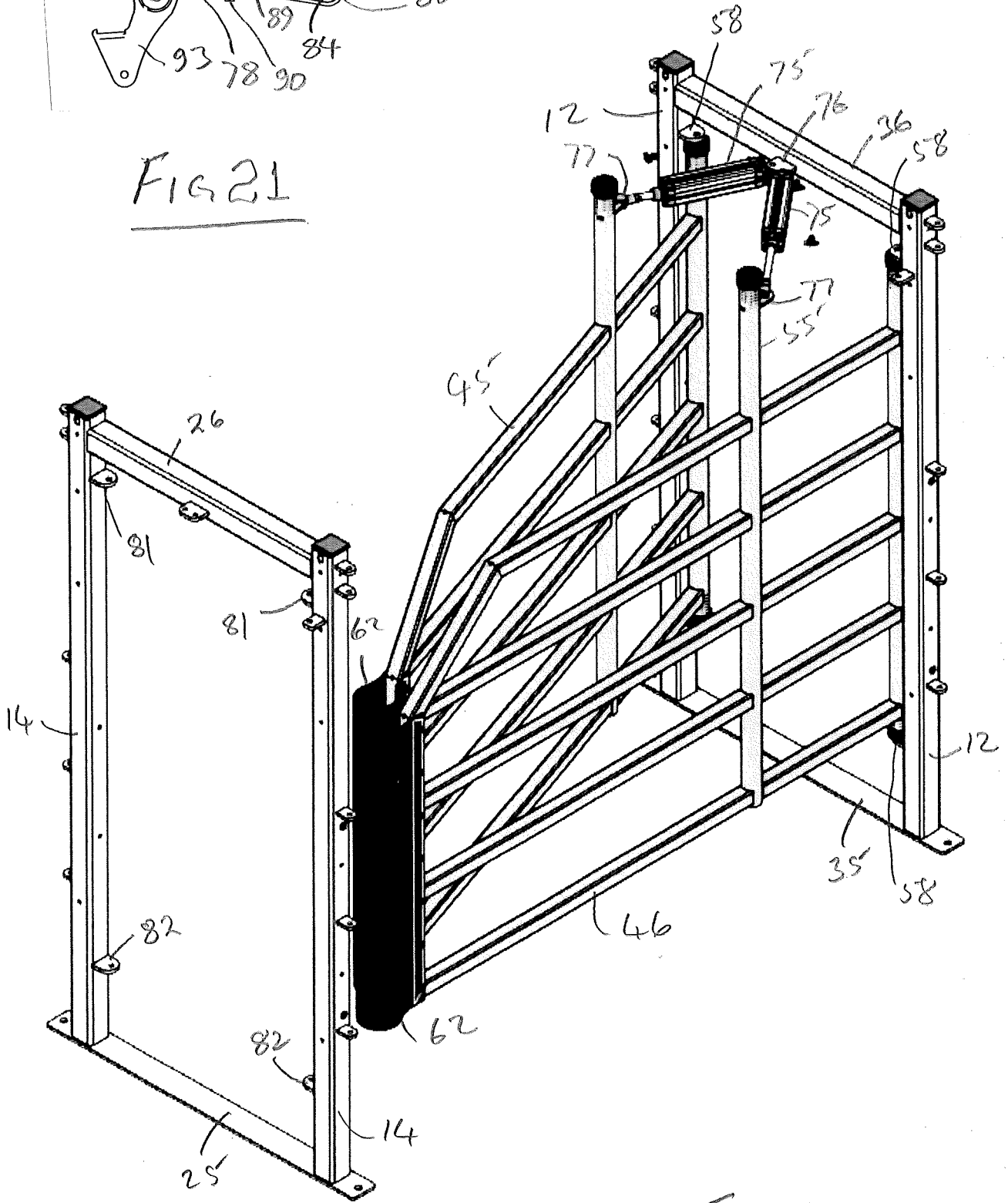
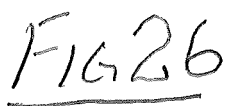
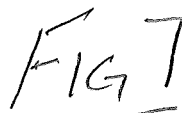
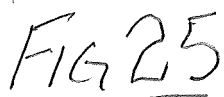


FIG 6



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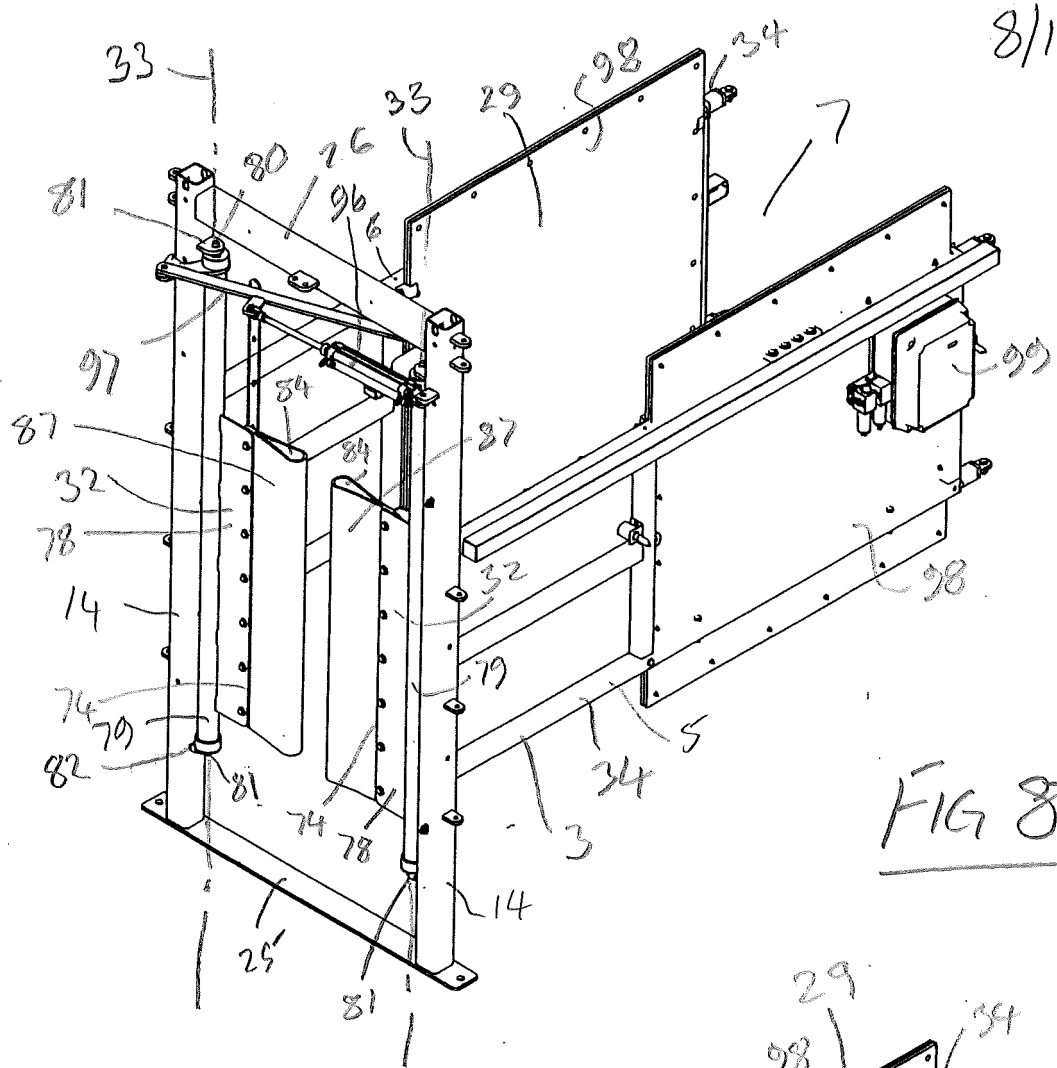


FIG 8

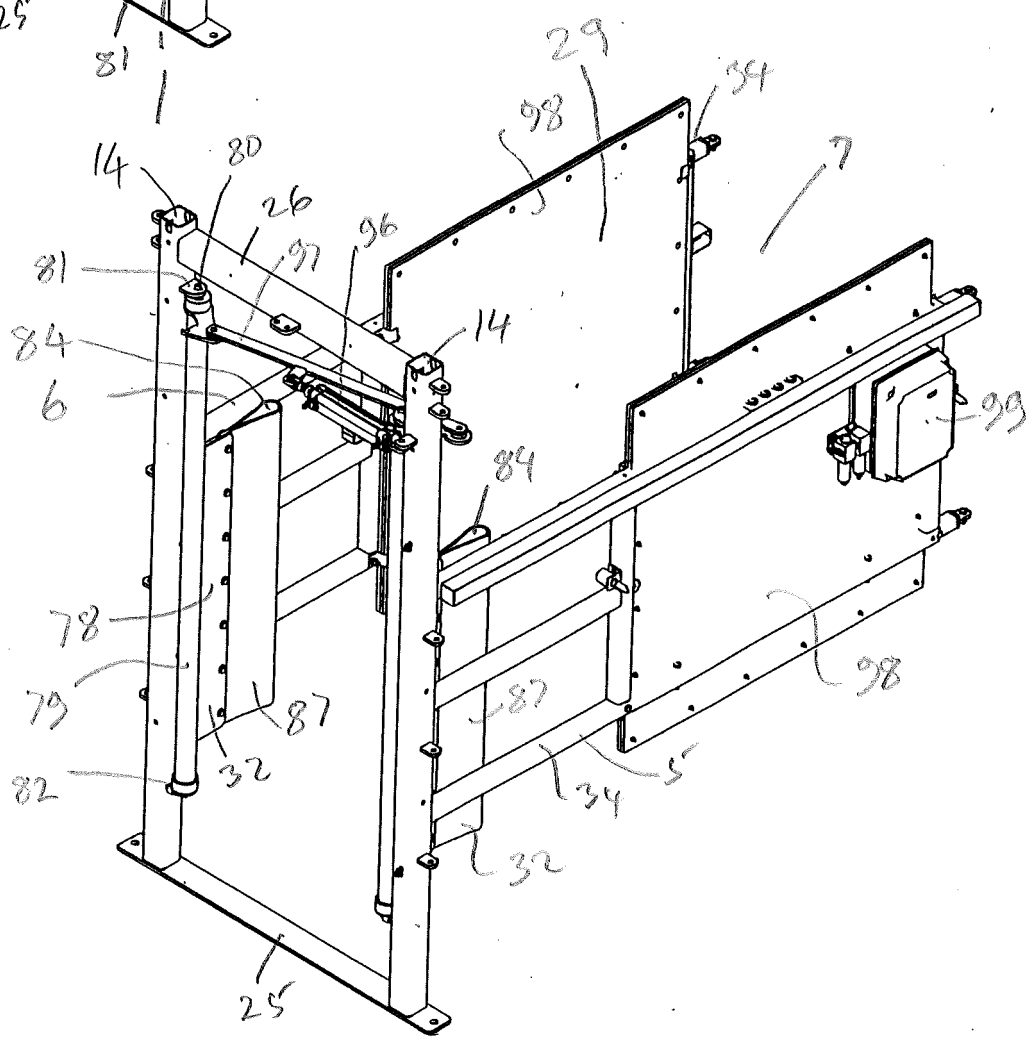


FIG 9

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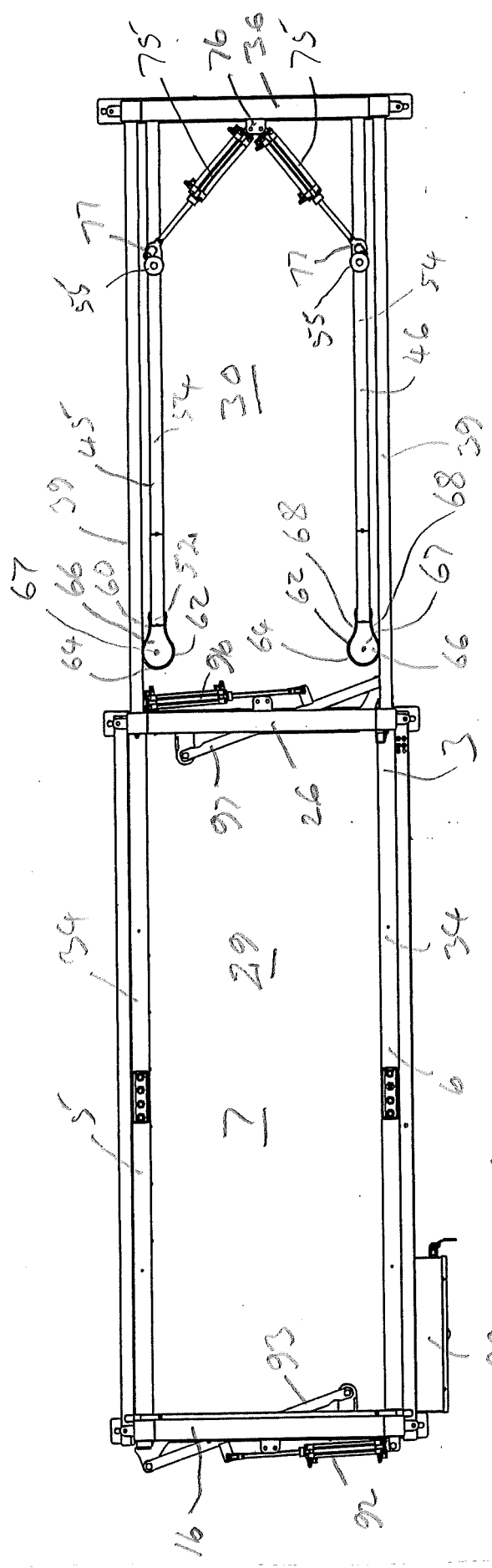


Fig 10

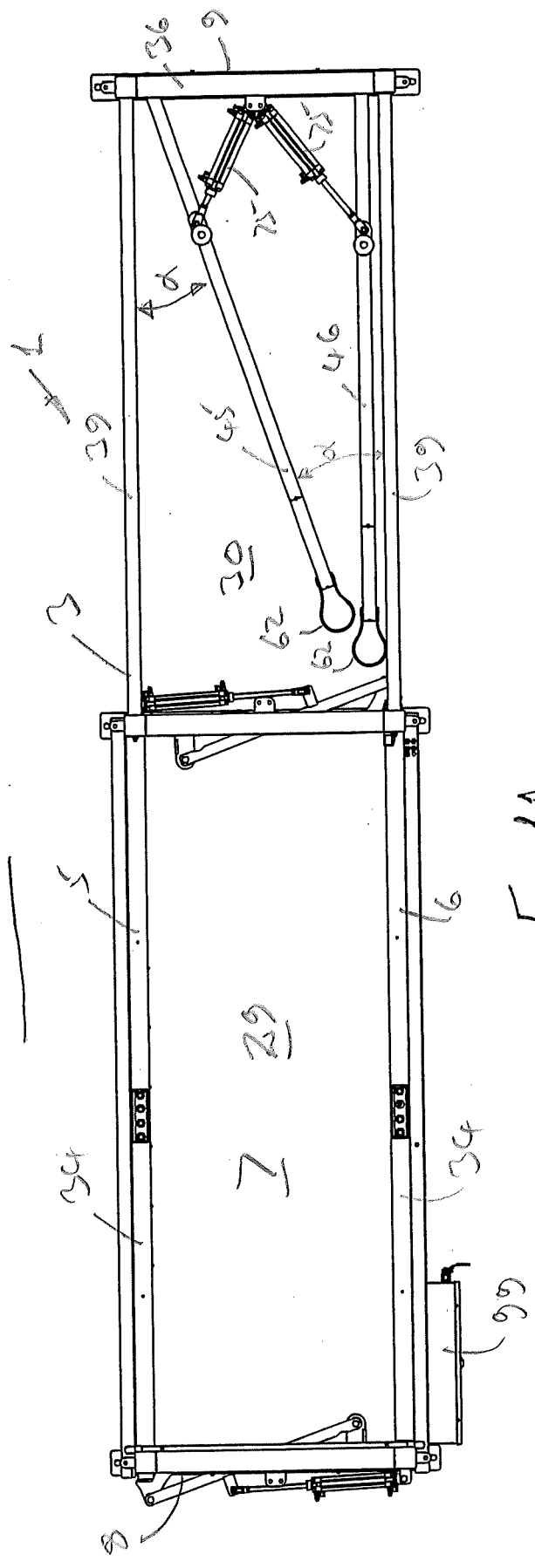


Fig 11

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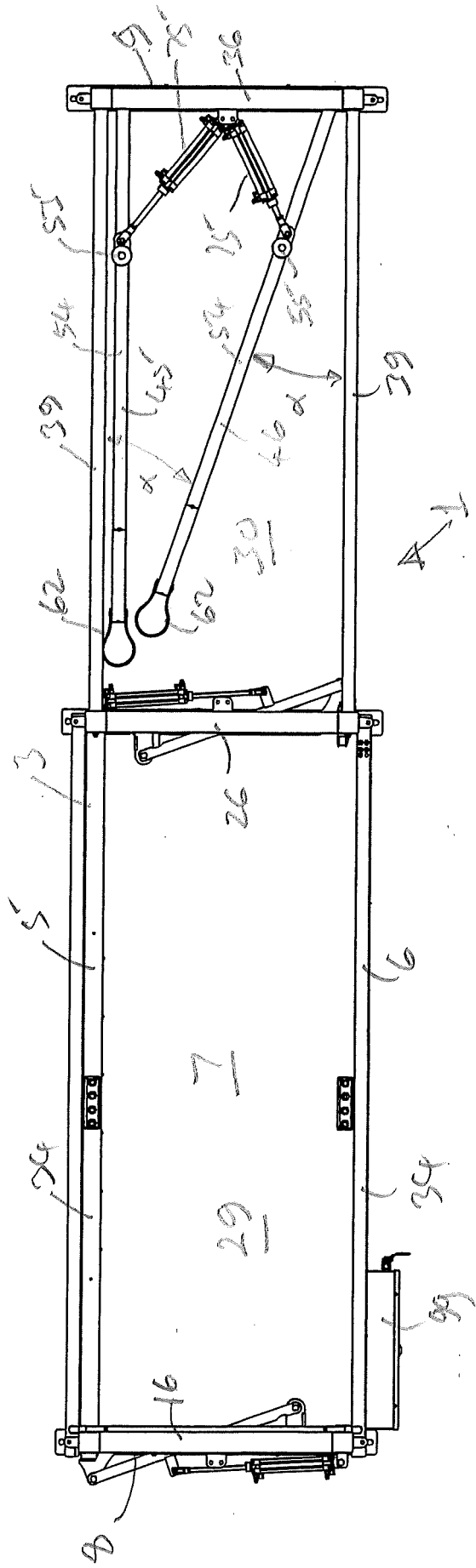


FIG 12

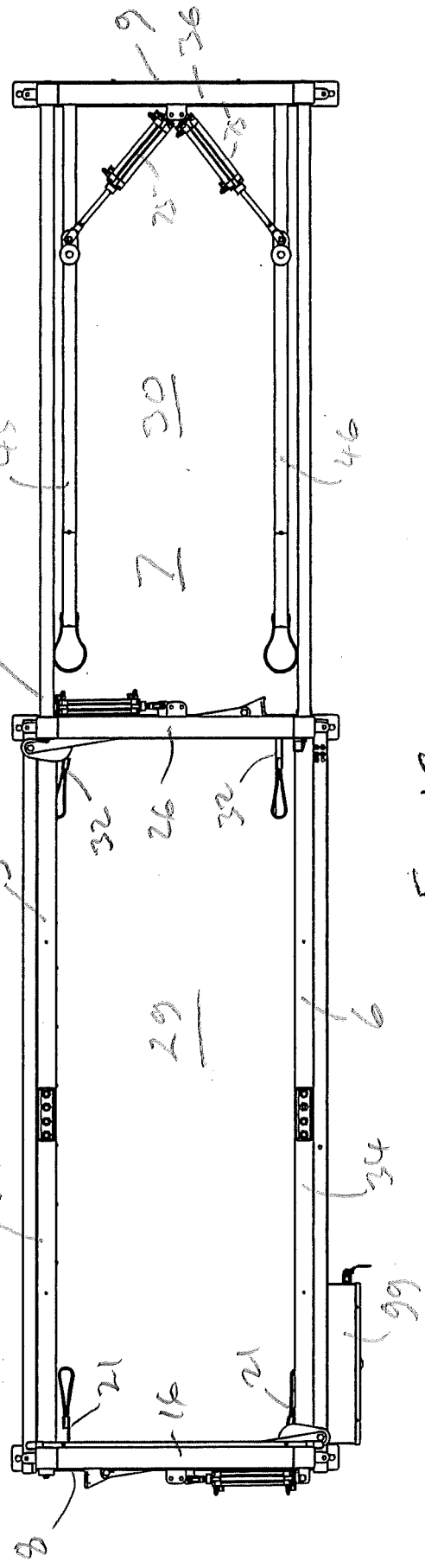


FIG 13

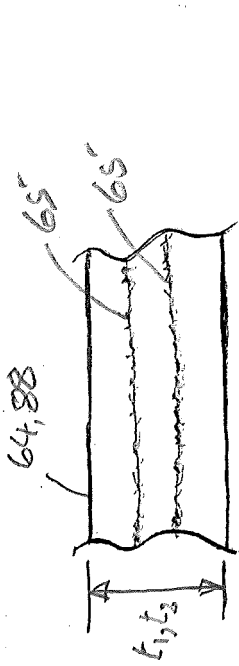


FIG 23

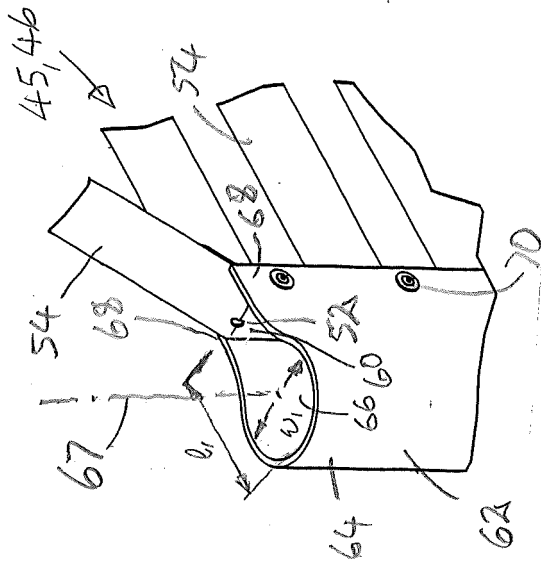


FIG 22

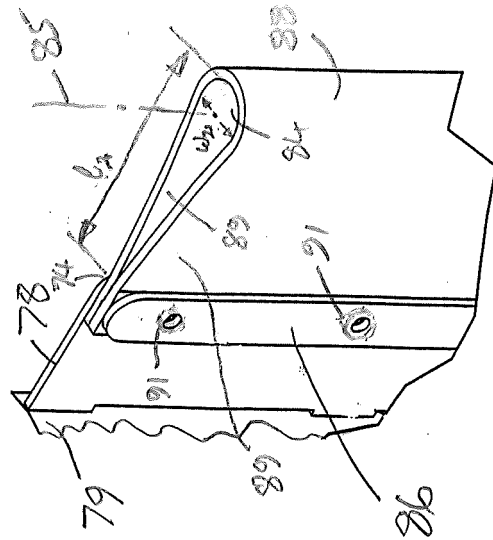


FIG 24

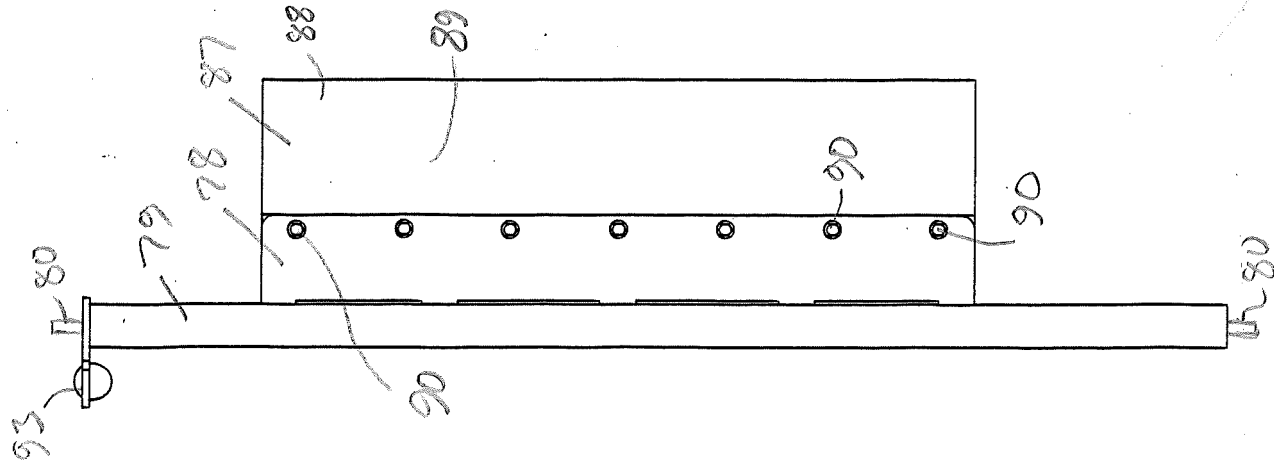


FIG 19

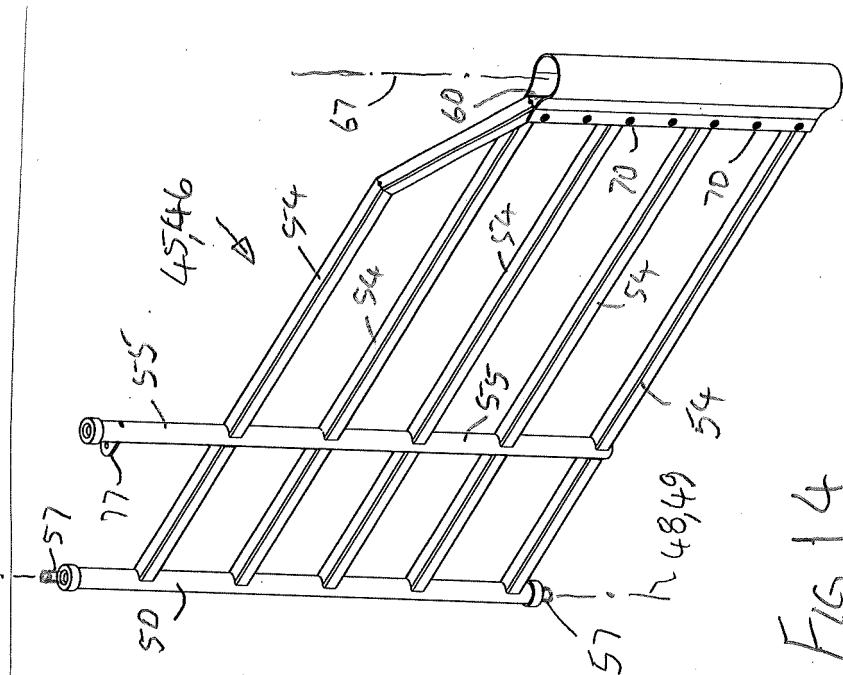
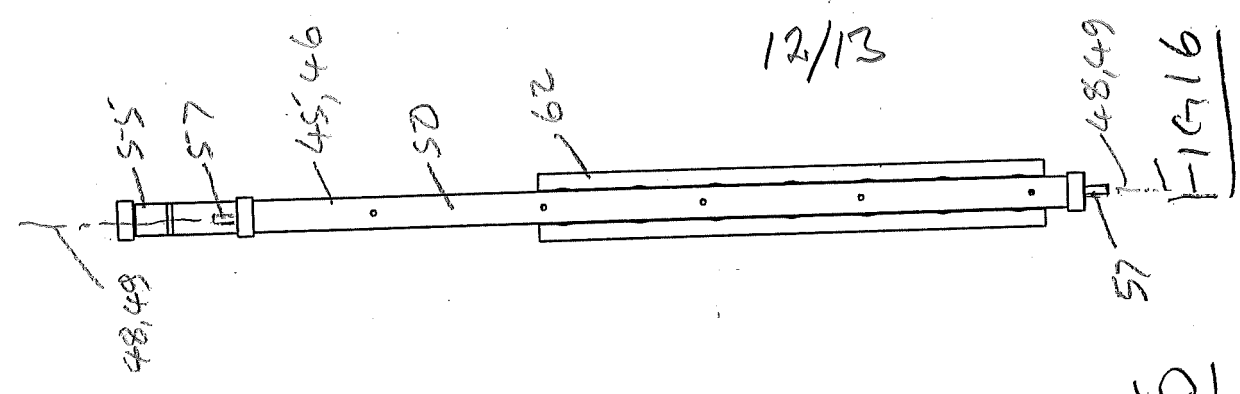
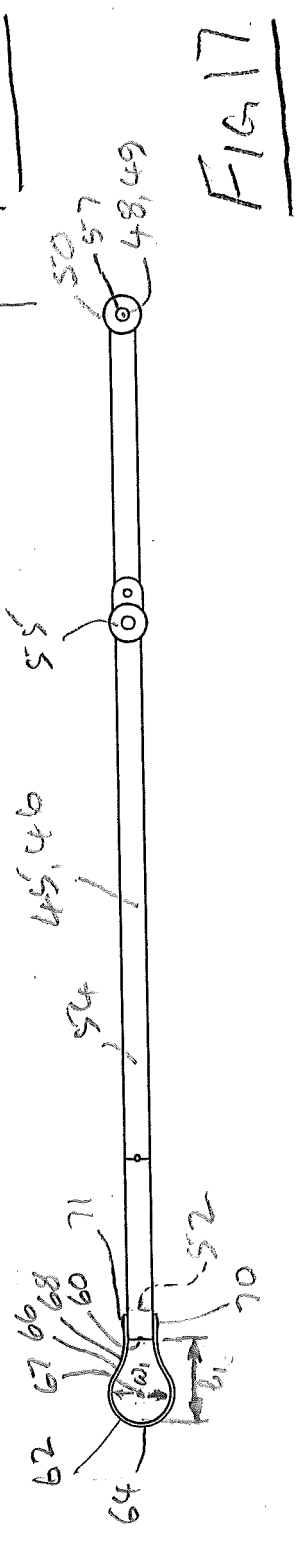
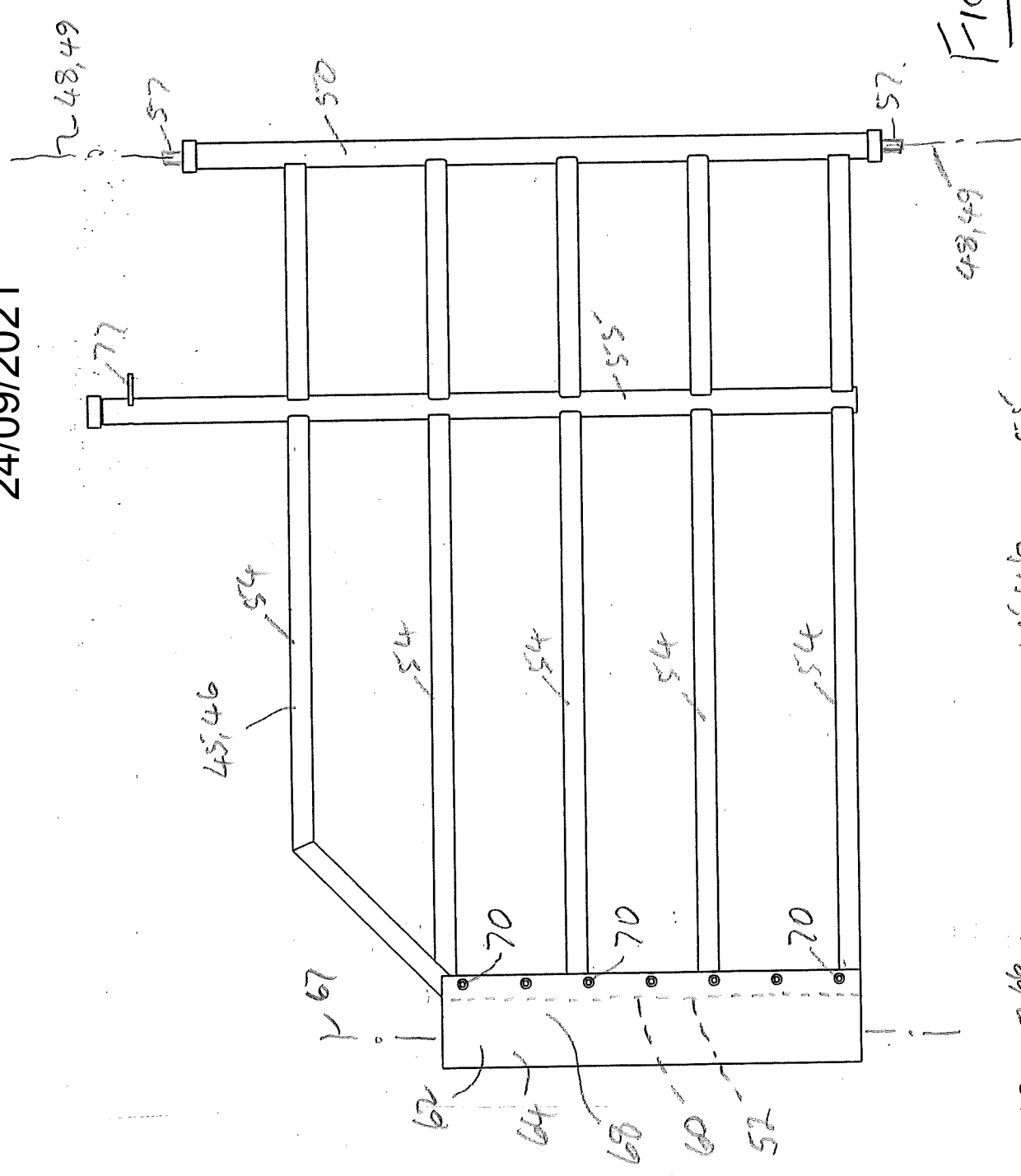


FIG 14



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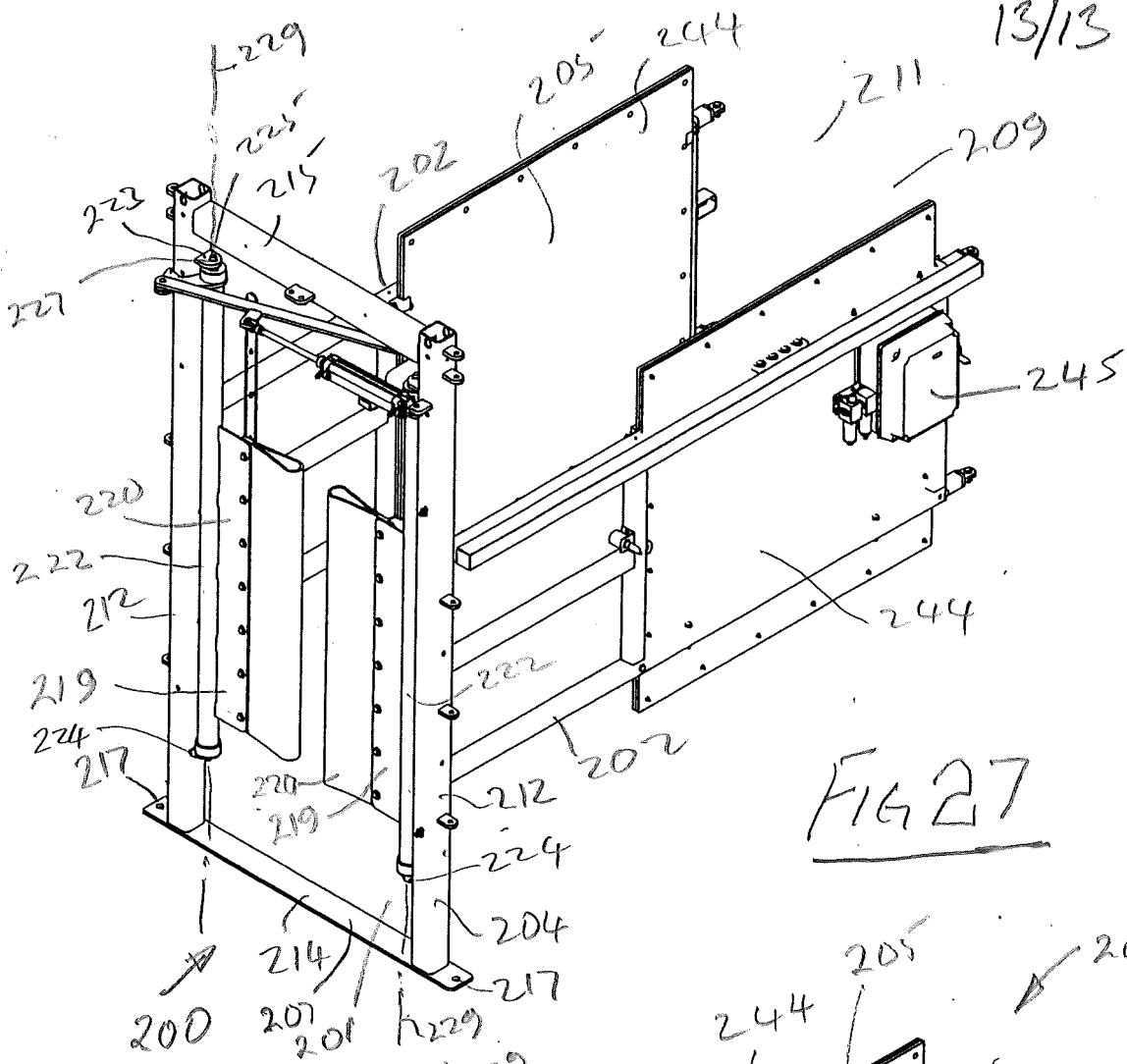


FIG 27

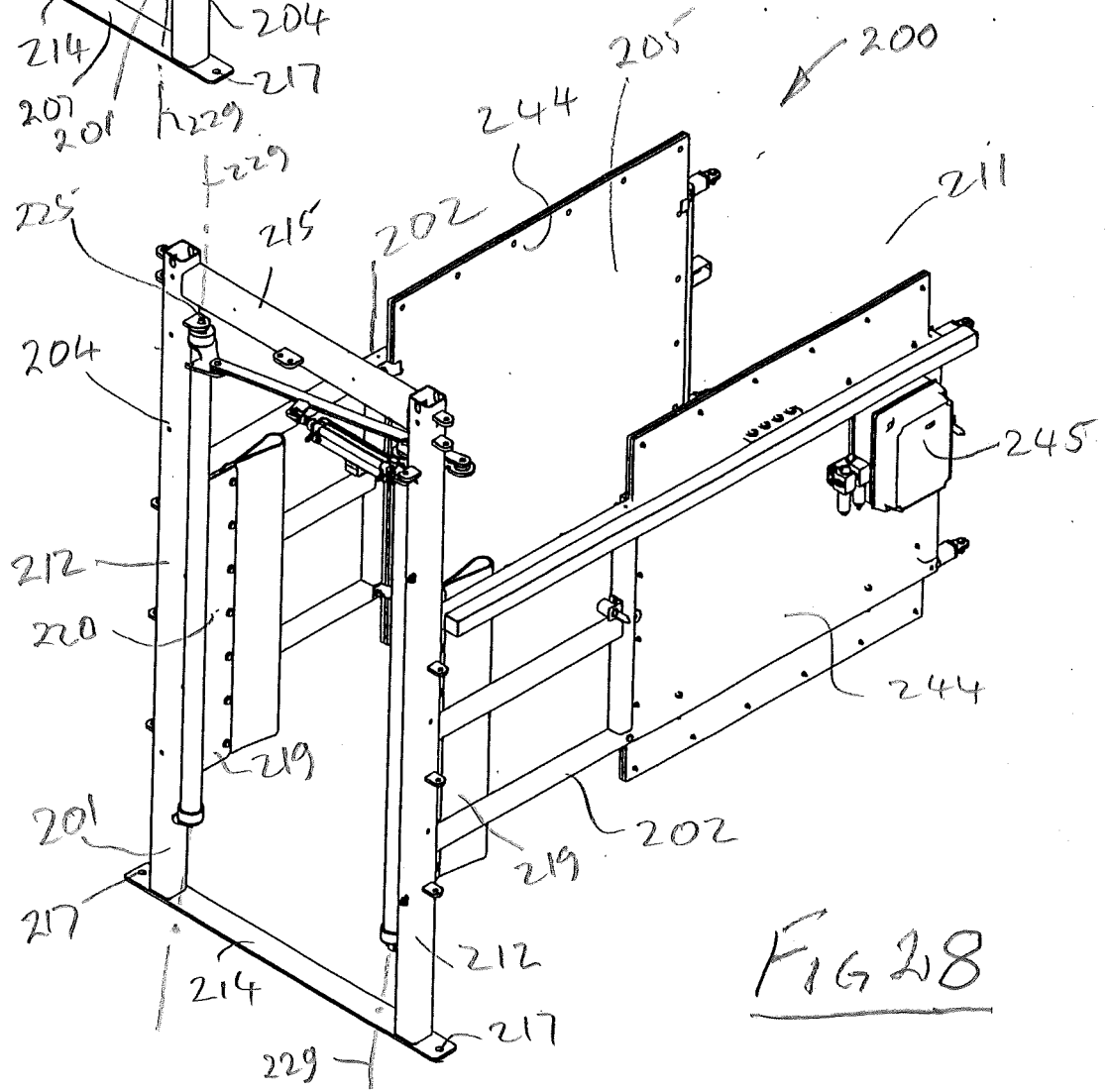


FIG 28