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(54) Title: HOOF TRIMMING CHUTE AND APPLICATION

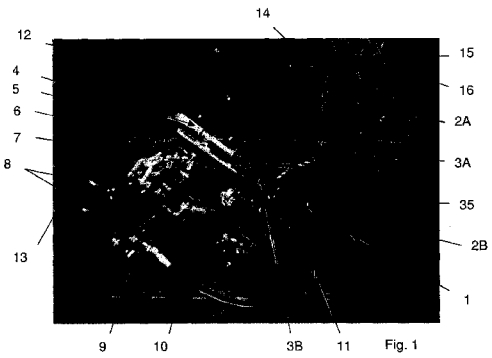

Fig. 1

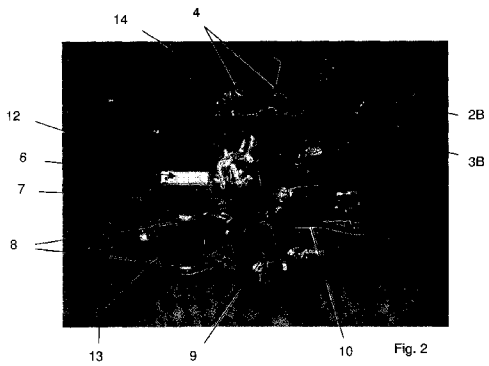

Fig. 2

(57) Abstract: The invention includes a hoof trimming chute for animals including live stock where the hoof trimming chute is constructed around four vertical corner posts including two front corner posts where in direction towards the front ends of the animals and two rear corner posts in direction towards the rear ends of the animals and where the hoof trimming chute is provided with a floor (12) and a rear end gate (20) where the hoof trimming chute includes at least one, preferably two, adjustable foreleg holders (1) and at least one adjustable hind leg support (21). The invention also includes application of hoof trimming chute for cattle including milk cows. With the invention the necessity of the hoof trimming staff having to put their arms in below the animals, which are to be hoof trimmed, is removed, whereby the risk of injuries on the hoof trimming staff, as a result of kicks from the animals, is reduced to a minimum.

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Hoof trimming chute and application

The invention relates to a hoof trimming chute for animals including live stock where the hoof trimming chute is constructed around four vertical corner posts hereof two corner posts at the front facing the front of the animals and two rearmost corner posts facing the back of the animals and where the hoof trimming chute is provided with a floor and a rear end gate where the hoof trimming chute includes at least one, preferably two, adjustable foreleg holders and at least one adjustable hind leg support where the adjustable foreleg holder includes at least two turning joints with vertical axes of rotation, which connect at least two movable arms and where one of the turning joints is placed by one of the corner posts in the front of the hoof trimming chute and at least one turning joint with horizontal axis of rotation.

Moreover, the invention relates to the application of hoof trimming chute.

It is known to use hoof trimming chutes for trimming hoofs on animals such as live stock. The hitherto known hoof trimming chutes have, however, relatively few possibilities of adjustment, whereby the work with the hoof trimming often requires that the hoof trimmer with the arms must reach below the animal, which is to be hoof trimmed, in order to fasten the leg of the animal to the hoof trimming chute.

Since the animals are often stressed from being guided into a hoof trimming chute, they will often react with kicks, when they feel that the hoof trimmer tries to strap down a leg, where the hoof is to be trimmed.

With the hitherto known hoof trimming chutes, injuries therefore occur on the hoof trimmers as a result of kicks from the animals.

The injuries often include broken limbs and can be directly disabling.

From CH 468779 A (SCHAERER, OTTO) is known a hoof trimming chute with adjustable foreleg holders, which includes two turning joints, one in each end of the movable arm with vertical axes of rotation. These two turning joints with vertical axes of rotation connect at least two movable arms, and where one turning joint is placed at one of the corner posts placed at the front of the hoof trimming chute, which is the turning joint, which is equipped with the design for retention. The hoof trimming chute also includes two turning joints with horizontal axes of rotation, where a turning joint forms a bearing for an axle, which is turned a number of degrees in relation to the turning joint's horizontal axis of rotation.

It has been found, however, that the technique known from CH 468779 does not in a sufficient degree make it possible to adjust the foreleg holders.

It is therefore an object of the invention to improve the known type of hoof trimming chute and the application.

The object of the invention is achieved by a hoof trimming chute, of the in the introduction to claim 1 stated type, which is characterized in that the adjustable foreleg holder includes at least one turning joint, which is placed on the movable arm, which is far most away from the turning joint, which is placed by one of the corner posts placed at the front of the hoof trimming chute, where the turning joint has a horizontal axis of rotation and forms a bearing for an axle, which goes through the bearing, which is turned a number of degrees, preferably 90, in relation to the turning joint's axis of rotation and where foreleg holder elements are mounted to the end of the axle.

In this way it thus becomes possible to strap down the animals, which are to be hoof trimmed, with no need for the hoof trimmer putting his arms in below the animals in order to strap down the legs of the animal, whereby the risk of injuries, as a result of kicks, is reduced to a minimum.

Further appropriate embodiments for the hoof trimming chute are stated in the claims 2 to 5.

As mentioned, the invention also relates to the application of hoof trimming chute for cattle including milk cows.

The invention will now be explained more fully with reference to the drawings, in which:

Fig. 1 shows an adjustable foreleg holder for a hoof trimming chute.

Fig. 2 shows a section of an adjustable foreleg holder to a hoof trimming chute with focus on the foreleg holder elements.

Fig. 3 shows a section of an adjustable foreleg holder to a hoof trimming chute with focus on a movable hoof support.

Fig. 4 shows a section of an adjustable foreleg holder to a hoof trimming chute with focus on the turning mechanism to a movable hoof support.

Fig. 5 shows an adjustable foreleg holder to a hoof trimming chute seen from above in a collapsed state.

Fig. 6 shows the rear end of a hoof trimming chute with open rear end gate provided with a hind leg support.

Fig. 7 shows a section of a rear end gate to a hoof trimming chute with focus on an adjustable hind leg support.

Fig. 8 shows hind leg holders mounted on an adjustable hind leg support.

Fig. 9 shows a hind leg holder and a section of a hoof support device.

Fig. 10 shows a section of a hind leg support with rope for leg strapping.

In fig. 1 is with 1 shown an adjustable foreleg holder, which is mounted to the right front corner post on the hoof trimming chute.

The in fig. 1 shown foreleg holder is thus made to strap down the right foreleg on the animal, which is to be hoof trimmed.

In the present description, only depictions of this right foreleg holder are used from practical reasons.

The corresponding foreleg holder to the left foreleg is seen from above inverted in relation to the in fig. 1 shown foreleg holder, but otherwise technically identical.

The in fig. 1 shown adjustable foreleg holder (1) includes two turning joints (2A, 2B) with vertical axes of rotation, which connect two movable arms (3A, 3B) and where one of the turning joints (2A) is placed by one of the hoof trimming chute's front corner posts where there is also a turning joint (4) with horizontal axis of rotation, which is placed on the outermost arm (3B).

The adjustable foreleg holder (1) includes a turning joint (4), which is placed on the movable arm (3B), which is farthest from the turning joint (2A), which

is placed by one of the hoof trimming chute's front corner posts where the turning joint (4) has a horizontal axis of rotation and forms bearing for an axle (5), which goes out from the bearing, which is turned a number of degrees, preferably 90 degrees, in relation to the turning joint's (4) axis of rotation and where foreleg holding elements (6,7,8) are mounted to the end of the axle.

The adjustable foreleg holder (1) can be moved up and down controlled by the column (16).

In fig. 3 is seen that the foreleg holding elements (6,7,8) include a gripping plate (7), fastened to the axle (5), and a number, preferably two, in relation to the gripping plate (7) movable gripping hooks (8) and a movable hoof support (6), which via an arm (17) can be turned via an embedded toothed wheel (18), which in a preferred embodiment is connected to a motor including a hydraulic motor.

In fig. 1 is shown how hydraulic hoses (11) in a preferred embodiment are used to operate hydraulic cylinders and motors (9,10), which control gripping hooks (8) and hoof support (6).

Moreover, it is seen that the arms (3A, 3B) can be turned manually via a grip (35).

In fig. 2 is seen a section of the foreleg support (1) in another depiction angle than the one shown in fig 1.

Fig. 3 shows a section of a foreleg support (1) with focus on the hoof support (6), which is turned to a position, which is longest from the gripping plate (7).

In fig. 4 is shown a section of a foreleg support (1) with focus on the hoof support (6), which is turned to a position, which is below the gripping plate (7).

Fig. 5 shows an adjustable foreleg holder (1) to a hoof trimming chute, seen from above, in a collapsed state, where the gripping hooks (8) are retained in the turning joint (4) by a rope (19).

In fig. 6 is shown the rear end (23) of a hoof trimming chute with open rear end gate (20), which is provided with a hind leg support (21). The rear end gate is hinged to an end pole (22) via hinges (27A, 27B), which are shown on fig. 7.

In fig. 7 is shown a section of a rear end gate (20) to a hoof trimming chute with an adjustable hind leg support (21), which can be adjusted in the longitudinal direction of the hoof trimming chute when the rear end gate (20) is closed, whereby the hind leg support can be adjusted such that it precisely fits to the length of the animal, which is to be hoof trimmed.

The hind leg support (21) can be moved in guiding track (26).

The movement can be activated via initiation of a hydraulic cylinder, which via connection mechanics (25) can move the hind leg support (21).

In fig. 8 is shown a section of the hind leg support (21), which is provided with two hind leg holders (28A, 29A – 28B, 29B), which is each characterized in having two contact surfaces for contact against the legs of the animal.

Between the hind leg holders (28A, 29A – 28B, 29B), there is placed a hoof support device (30), which can be turned to respectively support the right or

left rear hoof of the animal, which is to be hoof trimmed.

Fig. 9 shows a section with a hind leg holder (28A, 29A) for strapping down the left hind leg of the animal, which is to be hoof trimmed, where the hoof can be supported by the hoof support device (30), which via an arm (31) can be turned via a rotatable embedded axle (32) for respectively the rear left or right hoof.

Fig. 10 shows a section of a hind leg support (28A, 29A) with a rope (32) for strapping down legs, where the rope (32) is controlled in rolls (33).

The invention thus includes:

A hoof trimming chute for animals including live stock, where the hoof trimming chute is constructed around four vertical corner posts including two front corner posts in direction towards the front end of the animals and two rear corner posts in direction towards the rear end of the animals, and where the hoof trimming chute is provided with a floor (12) and a rear end gate (20) where the hoof trimming chute includes at least one, preferably two, adjustable foreleg holders (1) and at least one adjustable hind leg support (21).

Where the adjustable foreleg holder (1) includes at least two turning joints (2A, 2B) with vertical axes of rotation, which connect at least two movable arms (3A, 3B) and where one of the turning joints (2A) is placed by one of the hoof trimming chute's front corner posts, and at least one turning joint (4) with horizontal axis of rotation.

Where the adjustable foreleg holder (1) includes at least one turning joint (4), which is placed on the movable arm (3B), which is far most away from the turning joint (2A), which is placed by one of the hoof trimming chute's

front corner posts, where the turning joint (4) has a horizontal axis of rotation and forms a bearing for a, from the bearing going, axle (5), which is turned a number of degrees, preferably 90, in relation to the turning joint's (4) axis of rotation and where foreleg holding elements (6,7,8) are mounted to the end of the axle (5), which include a gripping plate (7), fastened to the axle (5), and a number, preferably two, in relation to the gripping plate 7, movable gripping hooks (8) and a movable hoof support (6).

Moreover, an adjustable hind leg support (21) is placed at the hoof trimming chute's rear end gate (20) and can be moved in relation to the rear end gate (20) in guiding track (26) in the hoof trimming chute's longitudinal direction, where the hind leg support (21) is provided with at least one, preferably two, hind leg holders (28A, 29A – 28B, 29B), and at least one hoof support device (30).

It is moreover a part of the invention that the hoof trimming chute's adjustments fully or partially can be supported by electrical or hydraulic components.

Patent claims

1. Hoof trimming chute for animals including live stock where the hoof trimming chute is constructed around four vertical corner posts hereof two corner posts at the front facing the front of the animals and two rearmost corner posts facing the back of the animals and where the hoof trimming chute is provided with a floor (12) and a rear end gate (20) where the hoof trimming chute includes at least one, preferably two, adjustable foreleg holders (1) and at least one adjustable hind leg support (21) where the adjustable foreleg holder (1) includes at least two turning joints (2A,2B) with vertical axes of rotation, which connect at least two movable arms (3A,3B) and where one of the turning joints (2A) is placed by one of the corner posts in the front of the hoof trimming chute and at least one turning joint (4) with horizontal axis of rotation **characterized** in that the adjustable foreleg holder (1) includes at least one turning joint (4), which is placed on the movable arm (3B), which is far most away from the turning joint (2A), which is placed by one of the corner posts placed at the front of the hoof trimming chute, where the turning joint (4) has a horizontal axis of rotation and forms a bearing for an axle (5), which goes through the bearing, which is turned a number of degrees, preferably 90, in relation to the turning joint's (4) axis of rotation and where foreleg holder elements (6,7,8) are mounted to the end of the axle (5).

2. Hoof trimming chute according to claim 1 **characterized** in that the foreleg holding elements (6,7,8) includes a gripping plate (7), fastened to the axle (5), and a number, preferably two, in relation to the gripping plate (7), movable gripping hooks (8), and a movable hoof support (6).

3. Hoof trimming chute according to claim 1 or 2 **characterized** in that the hind leg support (21) is placed at the hoof trimming chute's rear end gate (20) and can be moved in relation to the rear end gate (20) in guiding tracks (26) in the longitudinal direction of the hoof trimming chute.

4. Hoof trimming chute according to one or more of claims 1 to 3 **characterized** in that the hind leg support (21) is provided with at least one, preferably two, hind leg holders (28A, 29A – 28B, 29B), and at least one hoof support device (30).

5. Hoof trimming chute according to one or more of claims 1 to 4 **characterized** in that adjustments fully or partially can be supported by electrical or hydraulic components.

6. Application of hoof trimming chute according to one or more of claims 1 to 5 for cattle including milk cows.

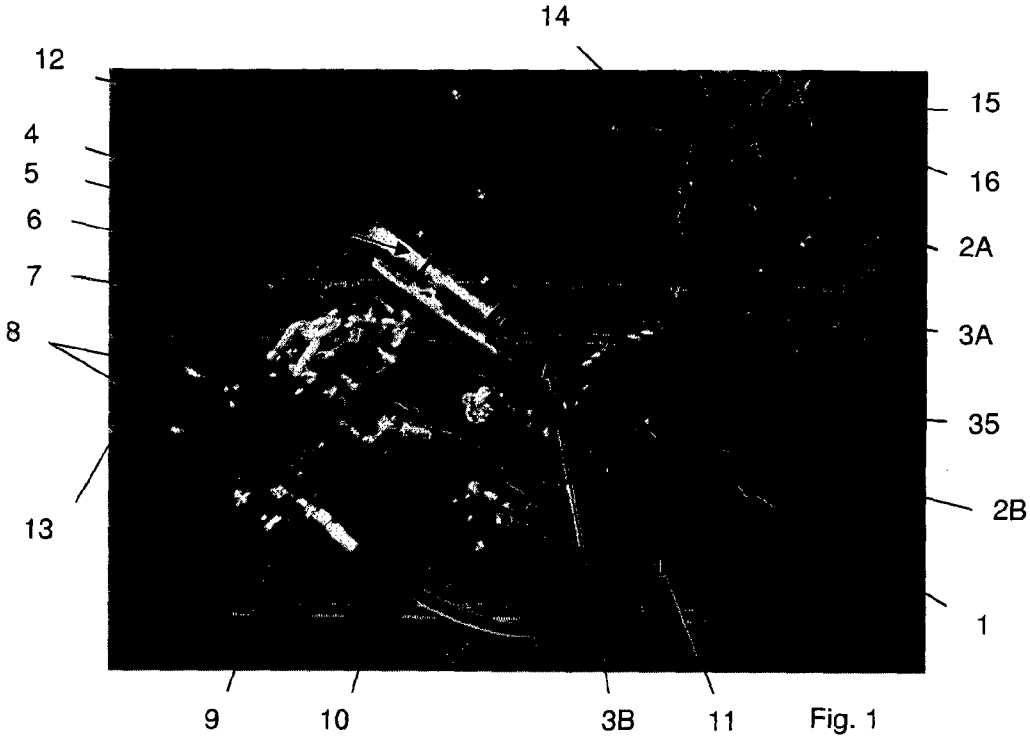

Fig. 1

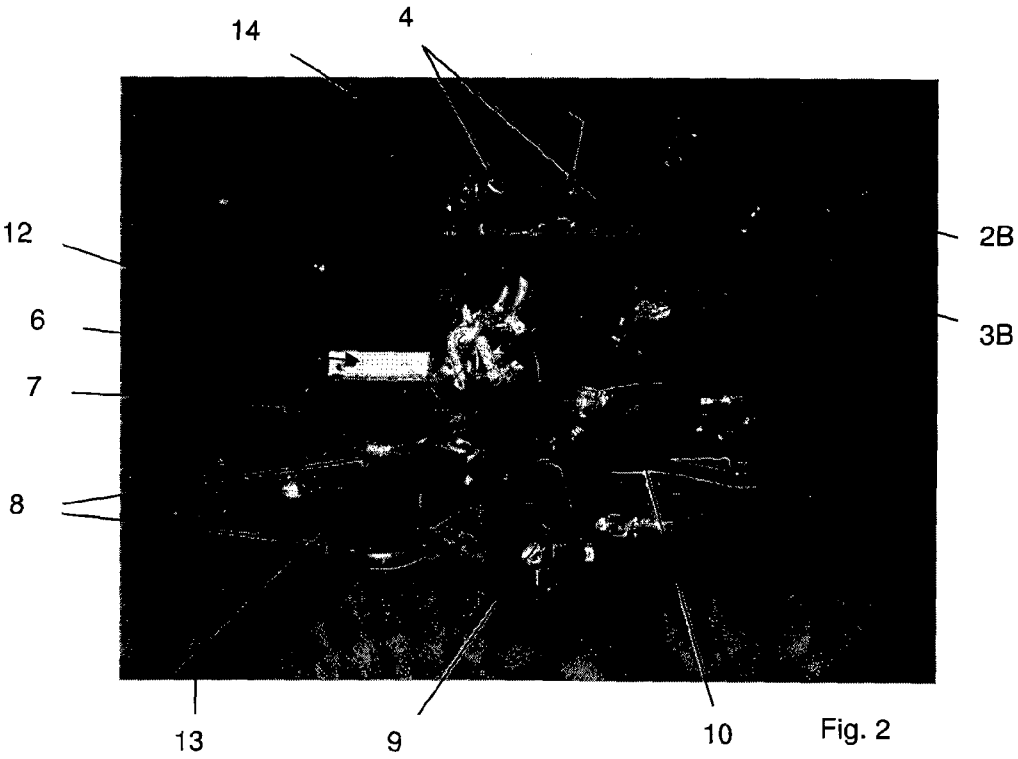

Fig. 2

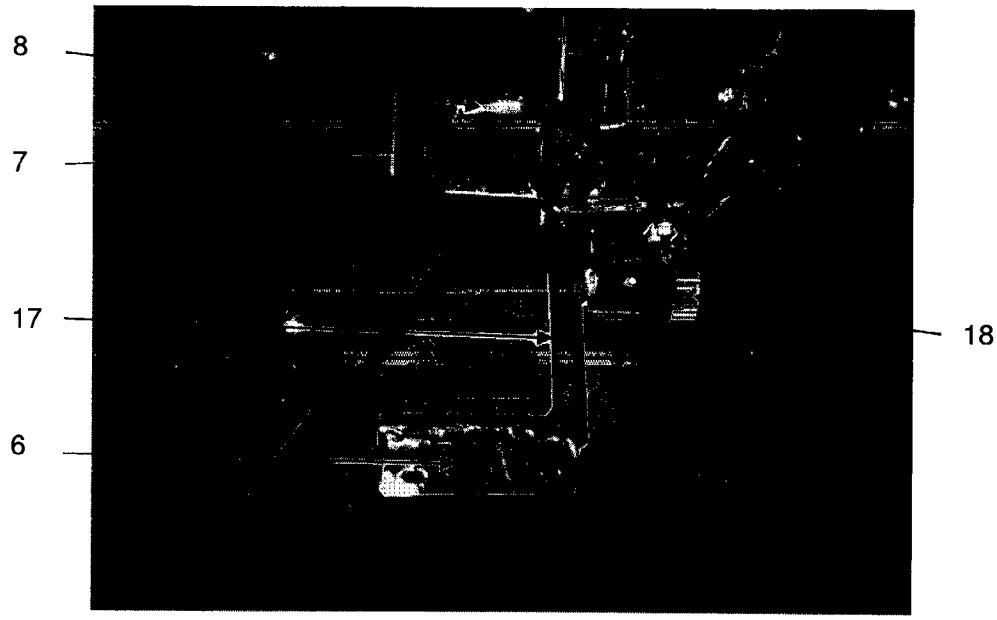

Fig. 3

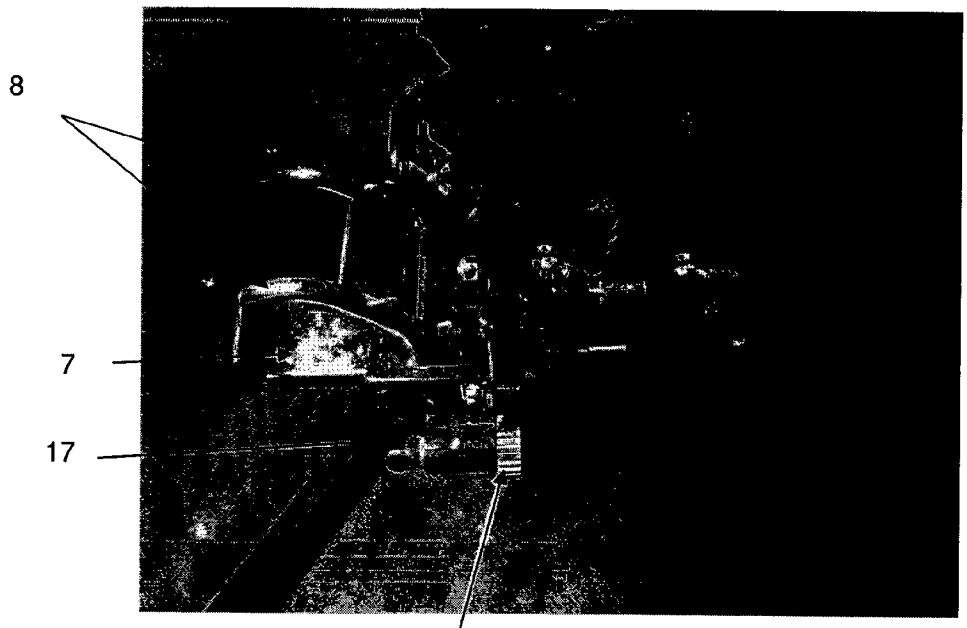

Fig. 4

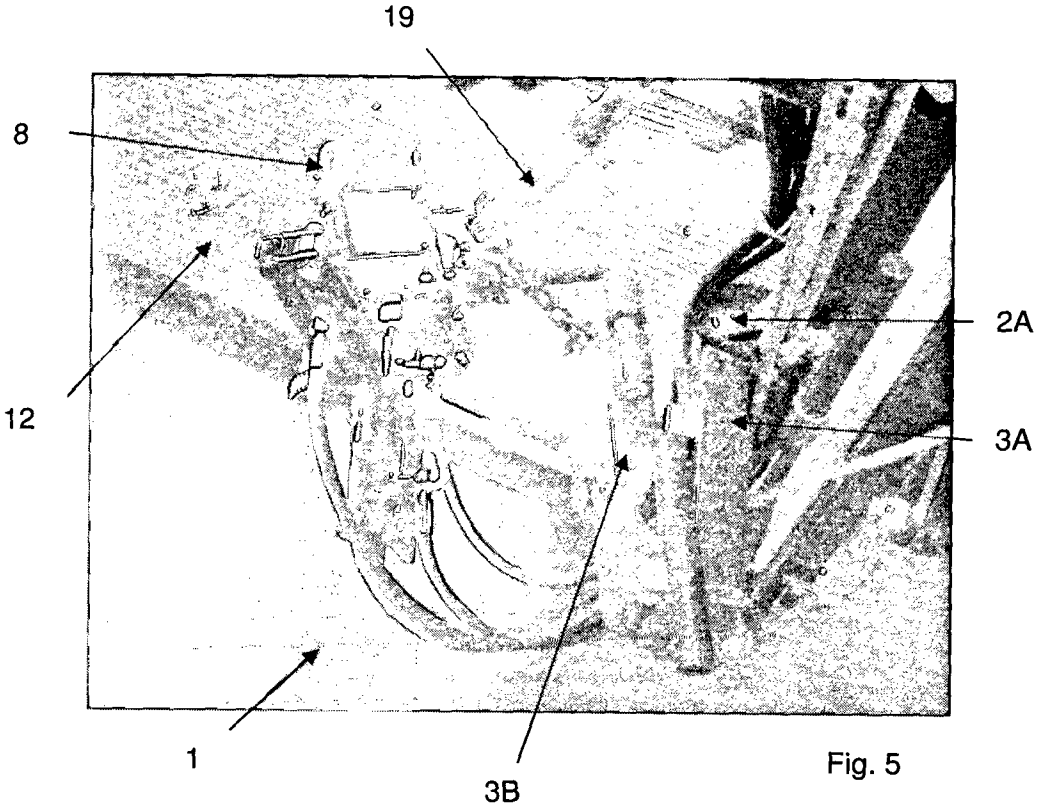

Fig. 5

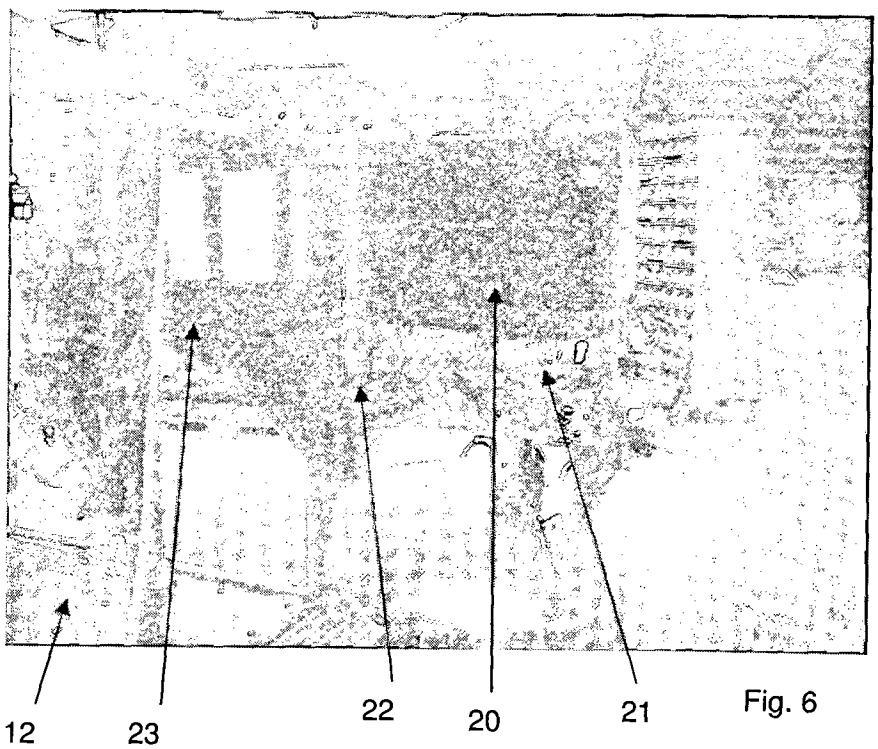

Fig. 6

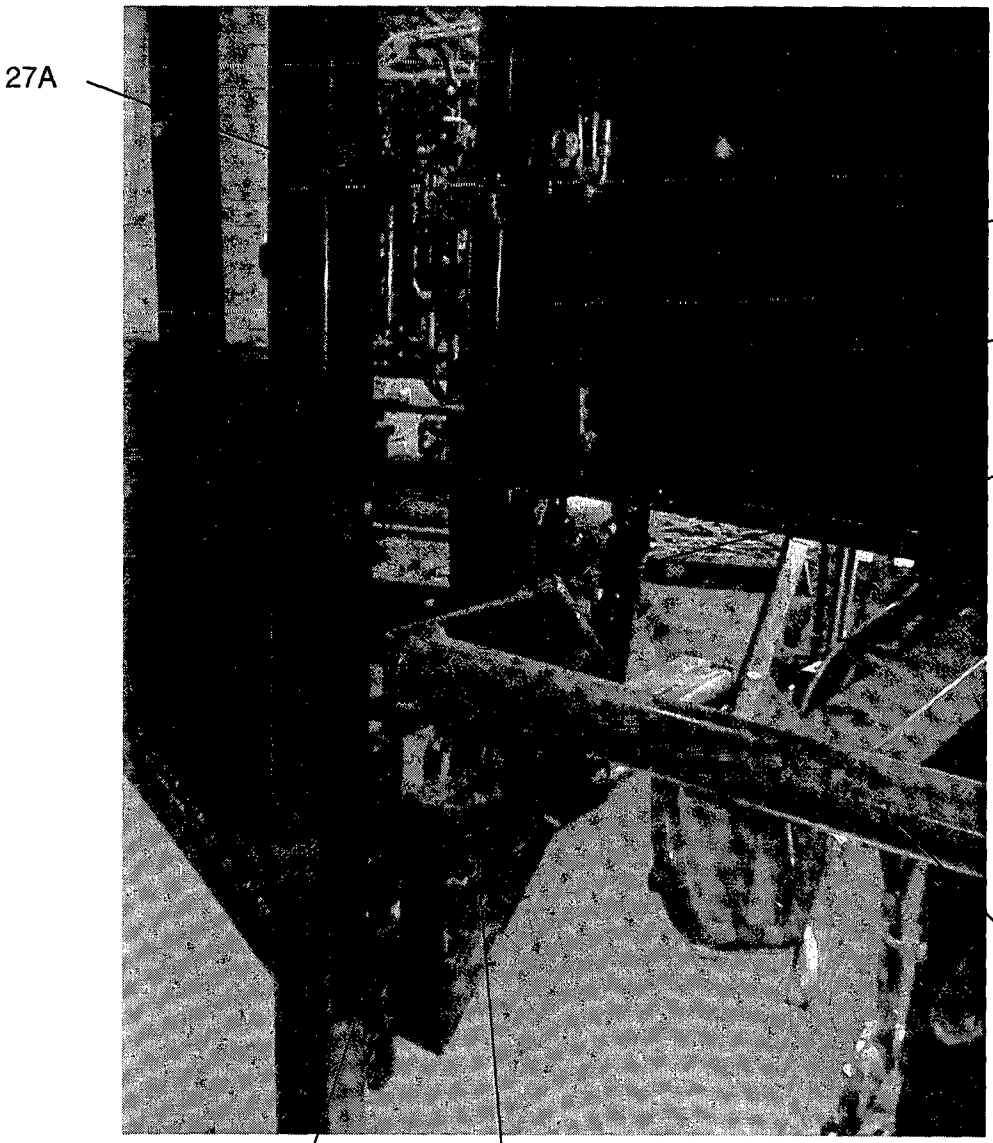

Fig. 7

Fig. 8

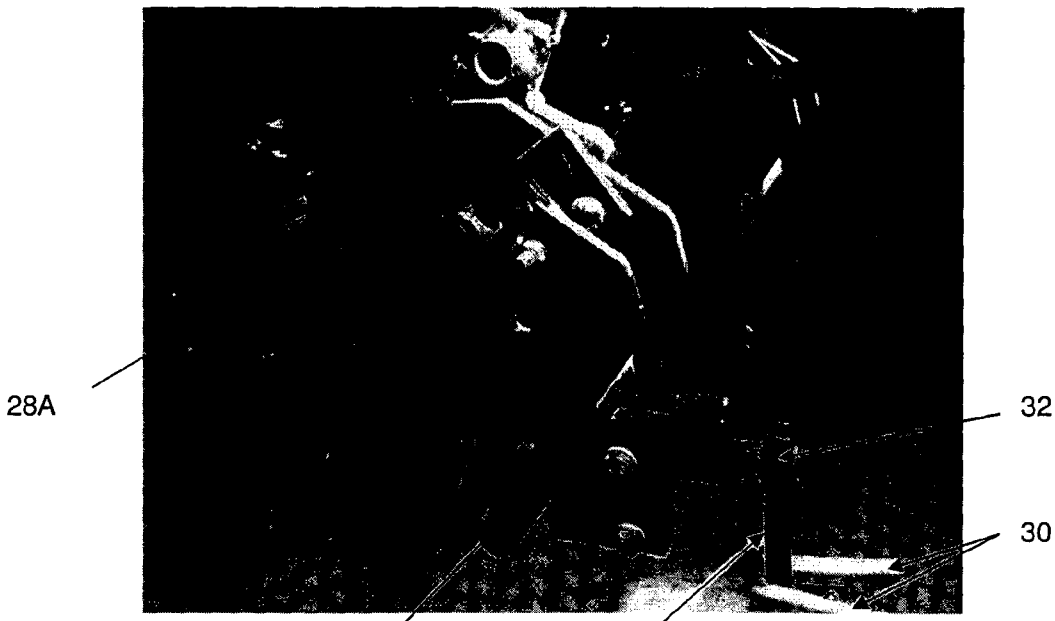

Fig. 9

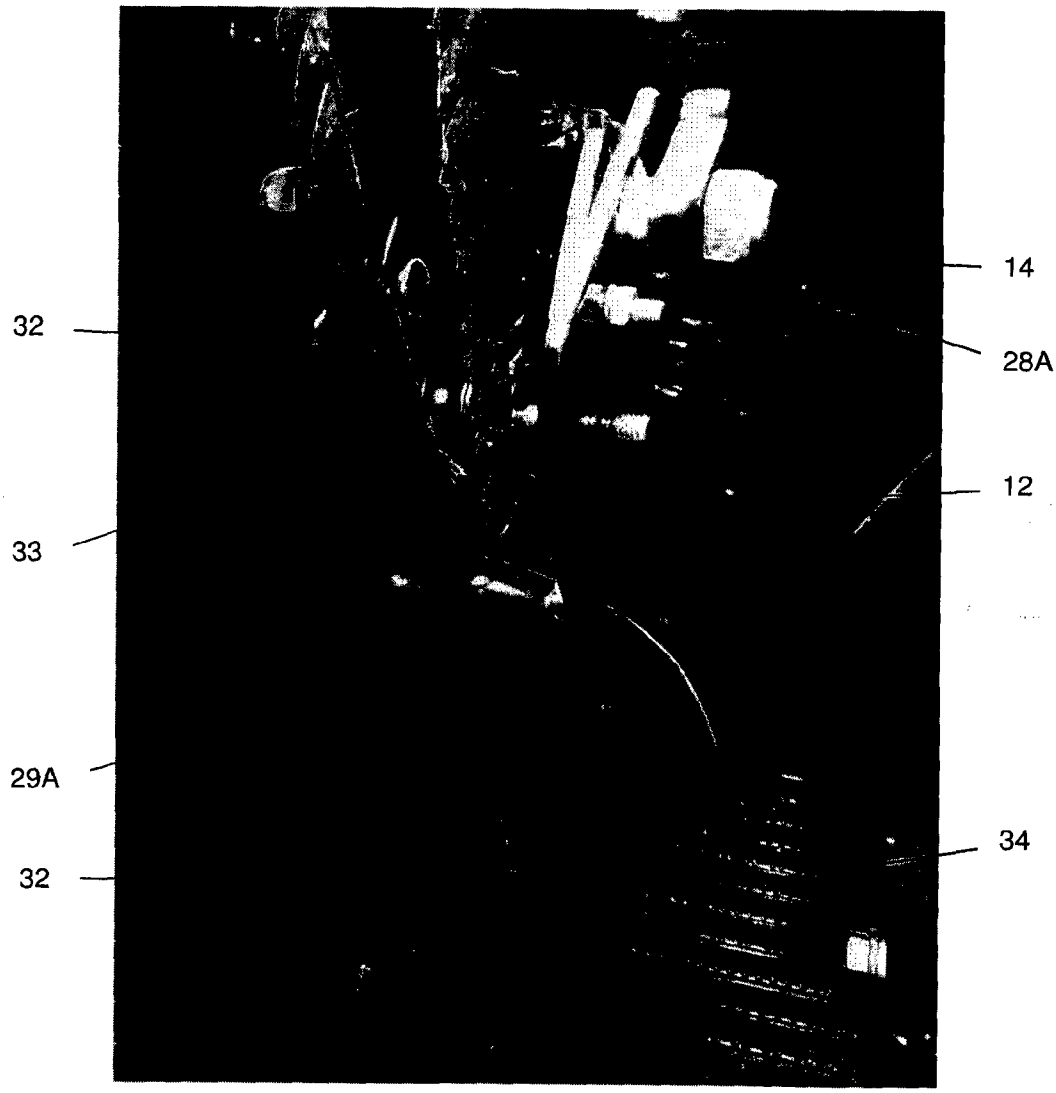

Fig. 10

INTERNATIONAL SEARCH REPORT

International application No.

PCT/DK2013/000022

A. CLASSIFICATION OF SUBJECT MATTER

A01L 13/00 (2006.01), A01L 15/00 (2006.01), A61D 3/00 (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A01L, A61D, A01K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

DK, NO, SE, FI: Classes as above.

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, WPI

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CH 468779 A (SCHAERER, OTTO) 1969.02.28	1-6
A	DE 29713038 U1 (GENOSSENSCHAFT KLAUENPFLEGER & SACHSEN G) 1997.10.09	1-6

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
26/06/2013	03/07/2013
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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/DK2013/000022

Patent document cited in search report / Publication date		Patent family member(s) / Publication date
CH 468779 A	1969.02.28	None
DE 29713038 U1	1997.10.09	None

Form PCT/ISA/210 (patent family annex) (July 2009)