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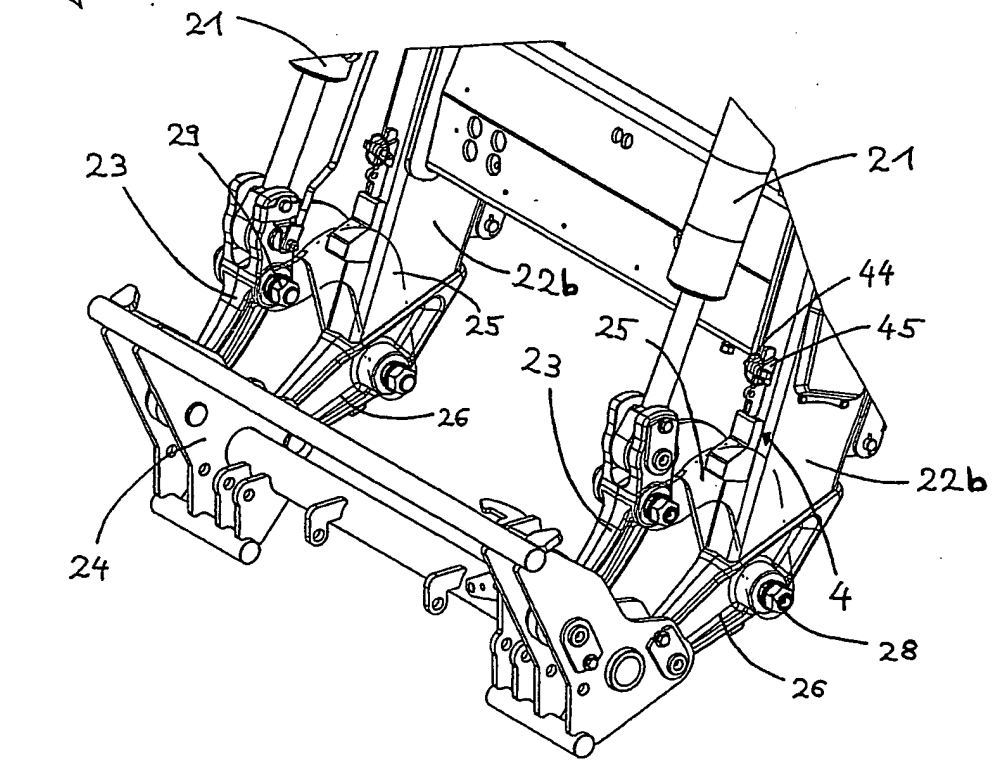
(54) Utility vehicle with a stop element on a front loader

(57) The invention relates to a utility vehicle with a stop element (4) for a front loader (2). The stop element (4) in this situation is shaped in such a way that a projection (232) located at a knee joint (23) is in contact with the stop element in such a way that in a first position of the stop element (4) a bucket is brought into the maximum inwards pivoting position, and, in a second position of the stop element (4), the bucket is brought into an inwards pivoting position which is smaller than the maximum inwards pivoting position. In this situation, the inwards pivoting position can be adjusted by means of the thickness of the stop element.

Fig. 2



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Description

[0001] The invention relates to a utility vehicle with a stop element for a front loader.

[0002] Many utility vehicles of today's design, such as tractors or tractor units, can have a front loader. This front loader, which can be connected at one end to the utility vehicle and at the opposite end to a take-up unit such as a bucket or a tool, can be used, for example, for the transport of a large number of objects. With the transport of large objects, however, the problem arises that these objects are shaped in such a way that they project out of the bucket. As a consequence of this projecting out of the objects from the bucket, the situation may arise, in an inwards pivoting position of the bucket, that the objects collide with the drive elements arranged on the front loader, such as the tilting hydraulic cylinder, or those components such as built-on parts which lie within the pivot range, and can therefore damage the tilting hydraulic cylinder.

[0003] The object on which the present invention is based now consists of providing a front loader in which a collision is prevented between the objects located in the take-up unit and the drive elements.

[0004] The advantages attained with the invention consist of the fact that, by means of a stop element, the distance interval between the bucket and the tilting hydraulic cylinders can be adjusted by a limitation of the inwards pivoting position of the bucket, and thereby a collision between the objects located in the bucket and the tilting hydraulic cylinders can be avoided. A further advantage is that the stop element is always secured to the vehicle, but can, if required, easily be replaced. Accordingly, depending on the size of the objects to be transported, different stop elements can be fitted. In addition, the position of the stop element can be adjusted relatively easily by hand, such that no additional means are required for controlling the position of the stop element.

[0005] Details of the invention are explained more closely on the basis of the drawing. This shows:

Figure 1: A utility vehicle with a front loader mounted;

Figure 2: A perspective view of the front loader with stop element; and,

Figure 3: In each case, a bucket position with a first and a second position of the stop element.

[0006] Figure 1 shows a utility vehicle with a front loader mounted. In this case, a front loader 2 is connected to a utility vehicle 1 at one end by means of a coupling device 3. Arranged in a pivotable manner at the end of the front loader 2 opposite the coupling device 3 is a take-up element 24 for mounting a take-up unit, such as a bucket, not shown in Figure 1. By means of a first drive unit arranged on the front loader 2, such as a tilting hydraulic cylinder 21, the pivoting movement of the take-up element 24 can be controlled about an axis of rotation. In this situation, the maximum inwards pivoting position of the take-up element 24 is mechanically limited by the position of a tilt adjustment element 23, designated hereinafter as the knee joint 23, by means of a stop element 4, not visible in Figure 1.

[0007] The take-up element 24 is pivotally mounted at the forward end of a pair of longitudinal lift arms 22. Each lift arm 22 comprises a first portion 22a coupled to the utility vehicle 1 by the coupling device 3 and a second portion 22b fixed to the first portion by an elbow joint 22c at one end and supporting the take-up element 24 at the other end.

[0008] The front loader 2 furthermore comprises a pair of second drive units, such as a raising hydraulic cylinder 27, each attached at one end to an intermediate point on a respective lift arm 22. The raising hydraulic cylinder 27 is connected to the coupling device 3 at the end opposite the lift arm 22. By means of the raising hydraulic cylinder 27, the front loader 2, and therefore the take-up element 24, can be raised and lowered. The adjustment of the raising hydraulic cylinder 27 and of the tilting hydraulic cylinder 21 is controlled from the driver's seat.

[0009] Figure 2 shows a perspective view of the front loader with stop element. The two lift arms 22, running parallel, are connected to one another by a transverse brace. Further, the lift arms 22 are connected at one end to a coupling element 26 in each case, wherein the coupling element 26 is connected to the take-up element 24 at the end opposite the lift arm 22. The tilting hydraulic cylinders 21 are, in this situation, connected at one of their ends by means of a knee joint 23 to the take-up element 24.

[0010] By means of a pivot guide piece 25, the knee joint 23 is arranged so as to rotate about a first rotation axle 28 arranged on the coupling element 26. In this situation, one end of the pivot guide piece 25 is connected to the first rotation axle 28 arranged on the coupling element 26, and the opposite end of the pivot guide piece 25 is connected to a second rotation axle 29 arranged on the knee joint 23. Accordingly, a raising movement of the tilting hydraulic cylinder 21 is converted by the knee joint 23 into a pivot movement of the take-up element 24.

[0011] Further, a stop element 4 is arranged in a displaceable manner on the second portion of the lift arm 22b. The fixing of the stop element 4 on the lift arm 22 can be effected by means of a fixing element 45 arranged on the lift arm 22, and by means of cut-outs located in the stop element 4. For example, the position of the stop element 4 on the lift arm 22 can be fixed by means of a fixing pin 44.

[0012] Figure 3 shows a bucket position with a first and a second position of the stop element. In this situation, the representation 3A and the representation 3B show a bucket 5 in a maximum inwards pivoting position of the take-up element 24, i.e. a projection 232 arranged on the knee joint 23 is in contact with the stop element 4.

[0013] The stop element 4 is composed of a contact area 41 and a fixing area 42. The contact area 41 of the stop element 4 in this situation has a first area 41' and a second area 41". The shape of the contact area 41, in particular of the first area 41' and of the second area 41" can, for example, be selected in such a way that, starting from the first area 41' with a constant initial thickness, at which the bucket 5 is brought into the maximum inwards pivoting position, the thickness of the stop element 4 increases, for example in linear fashion, to an end thickness in the second area 41 ", in which the bucket 5 is brought into such an inwards pivoting position which is smaller than the maximum inwards pivoting position, and at the same time ensures that the objects located in the bucket 5 do not collide with the tilting hydraulic cylinders 21 The thickness of the first and/or second areas 41', 41", therefore determines the inwards pivoting position of the bucket 5, wherein the inwards pivoting position becomes smaller as the thickness of the stop element increases.

[0014] The fixing area 42 of the stop element 4 is firmly secured to the contact area 41, for example by welding. The fixing area 42 in this embodiment example further has two cut-outs 43, 43' in the form of holes. By means of these cut-outs 43, 43', and the fixing element 45 arranged on the lift arm 22, the stop element 4 can be fixed on the lift arm 22, for example by means of a fixing pin. The distance interval between the two cut-outs 43, 43' in this situation is selected in such a way that the projection 232 is in connection with the contact area 41 in such a way that the bucket can attain, either for the first position of the stop element 4, its maximum inwards pivoting position, or, for the second position of the stop element 4, a lesser inwards pivoting position, determined by the shape of the contact area 41.

[0015] The representation 3A in this situation represents the position of the stop element 4 for the situation in which there is no object present inside the bucket 5, which could strike against the tilting hydraulic cylinder 21. The projection 232 is therefore in connection with the first area in such a way that the bucket 5 can be brought into the maximum inwards pivoting position.

[0016] The representation 3B is intended to present the situation in which the bucket 5 has objects shaped in such a way that they could collide with the tilting hydraulic cylinder 21. The projection 232 is in contact with the second area 41" in such a way that the bucket 5 can be brought into an inwards pivoting position determined by the shape of the contact area.

Claims

1. Utility vehicle with a stop element (4) for a front loader (2), a lift arm (22), on which the stop element (4) is arranged in a replaceable manner, and a tilt adjustment element (23), which in one position contacts the stop element (4).

2. Utility vehicle with a stop element (4) for a front loader (2), a lift arm (22), on which the stop element (4) is arranged in a displaceable manner, and a tilt adjustment element (23), which in one position contacts the stop element (4).

3. Utility vehicle according to Claim 1 or 2, wherein the adjustment element (23) has a projection (232), which is in contact with the stop element (4).

4. Utility vehicle according to any one of the preceding claims, wherein the stop element (4) has a shape such that, in at least one first position of the stop element (4) on the lift arm (22), the adjustment element (23) is arranged closer to the lift arm (22) than in at least one second position of the stop element (4).

5. Utility vehicle according to any one of the preceding claims, wherein the stop element (4) has at least two cut-outs (43, 43'), wherein in each case at least one cut-out (43, 43') is coupled to a fixing element (45) arranged on the lift arm (22), whereby the position of the stop element (4) on the lift arm (22) is adjustable.

6. Utility vehicle according to any one of the preceding claims, wherein the adjustment element (23) can be rotated about a first rotation axle (28) arranged on the lift arm (22), and, in one inwards pivoting position of a take-up unit (24) coupled to the adjustment element (23), is in contact with the stop element (4).

7. Utility vehicle according to any one of the preceding claims, wherein the stop element (4) has at least one first area (41') and at least one second area (41") with in each case a constant thickness, wherein the thickness of the second area (41") is greater than the thickness of the first area (41').

Fig. 1

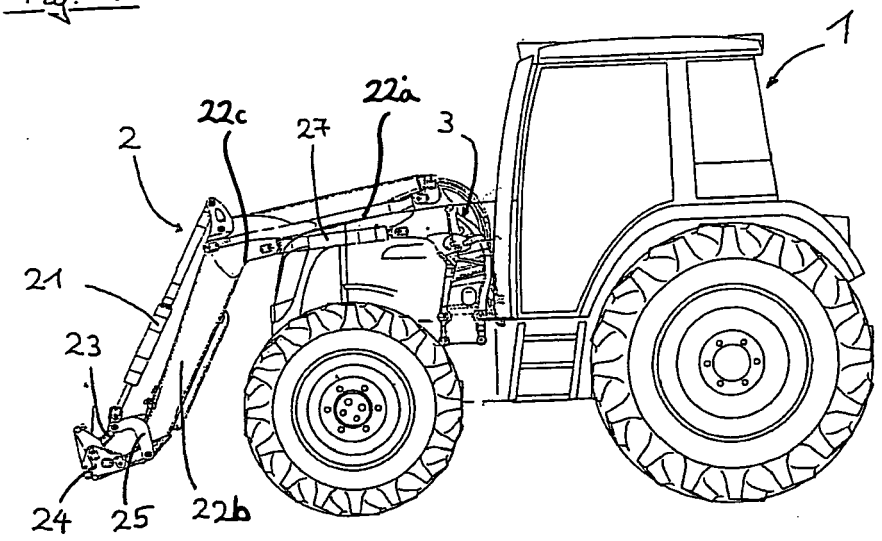

1
22a
22c
27
3
2
21
23
24
25
22b

Fig. 2

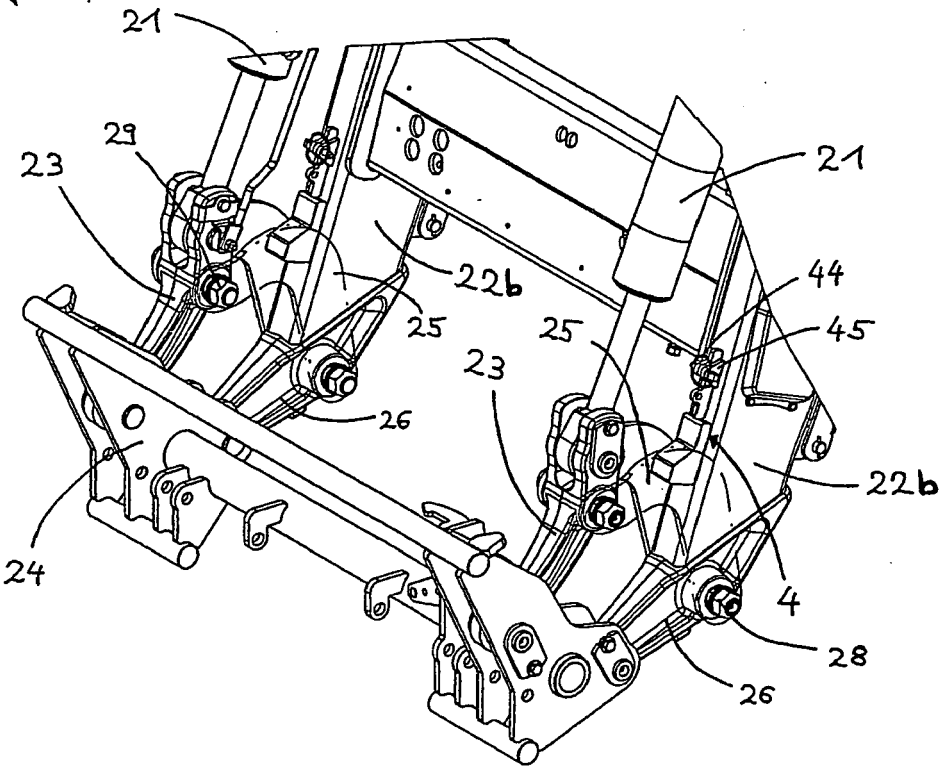
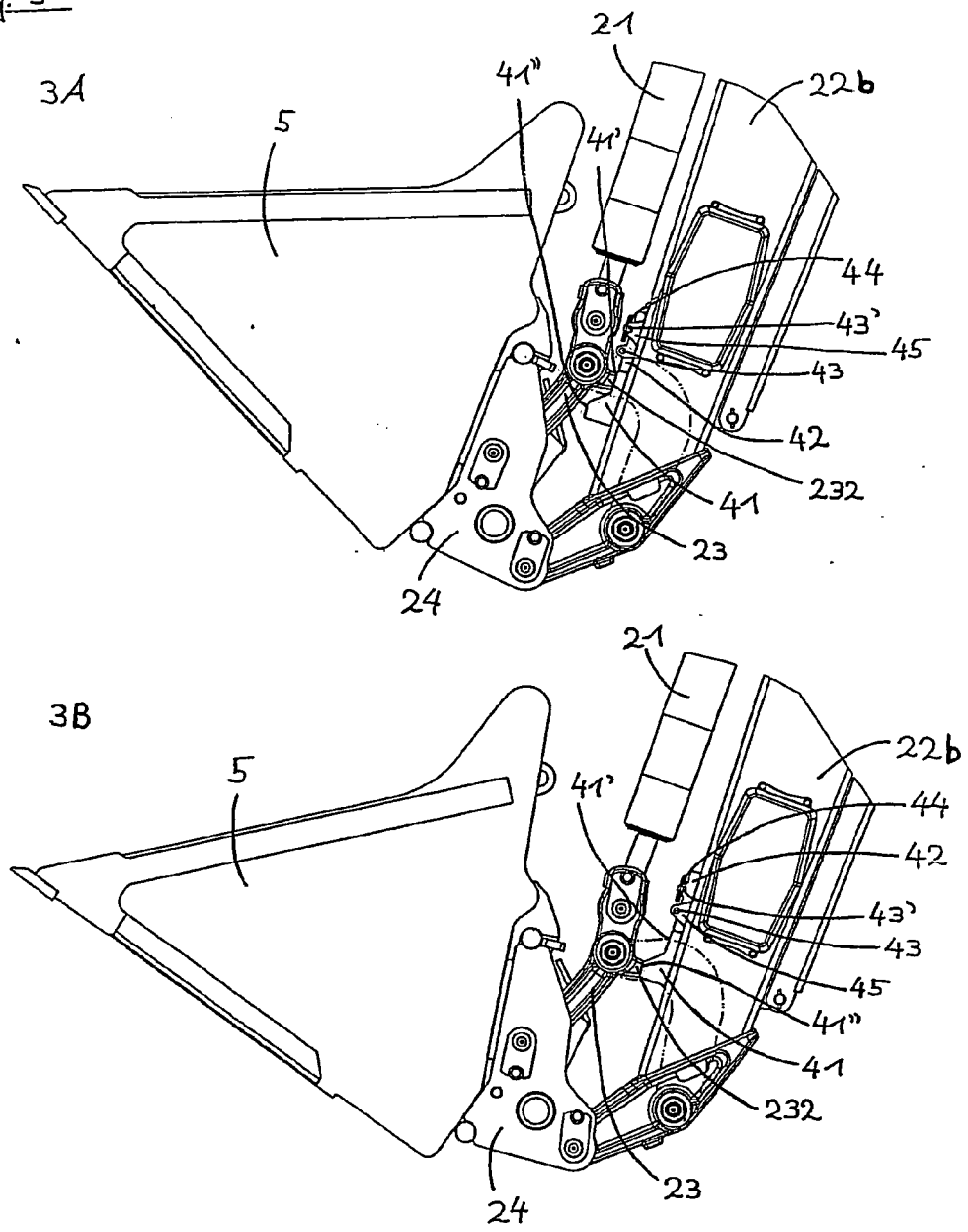

21
29
23
22b
25
26
24
21
44
45
25
23
22b
4
28
26

Fig. 3


3A
21
41"
22b
5
41'
44
43'
45
43
42
232
41
23
24
3B
21
22b
5
41'
44
42
43'
43
45
41"
41
232
23
24