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(54) **Work tool lock extension**

Verriegelbare Verlängerung für Arbeitswerkzeug

Extension de verrouillage d'outil de travail

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Description

Technical Field

[0001] This disclosure is directed towards a work tool lock extension configured to interlock with a work tool lock for securing the position of a work tool on a work machine.

Background

[0002] Work machines, such as backhoe loaders, excavators, wheel loaders, bulldozers and the like, may comprise work tools, such as backhoes and excavators. The work tools may comprise one or more booms, arms or sticks to which at least one work implement, such as a bucket, digger and the like, is attached. When the work machine is operational, the movement of the work tool is typically controlled using a hydraulic system. When the work machine is not operational, or when the work machine is travelling on a public road, and the work tool is not being used, the work tool may be locked in a secure storage position to the main body using a work tool lock. The work tool lock prevents the work tool from falling out of the desired position under its own weight, which may happen in the case of a hydraulic fluid leak or other reduction in fluid pressure in the hydraulic system. The use of a work tool lock is often required under national regulations when the work machine is travelling on public roads.

[0003] An example of a work tool lock is disclosed in US-A-2009-0107015. In the apparatus described therein a boom is pivotally attached to the main body of a work machine. The boom may be secured to the main body using a work tool lock comprising a lock pin and a lock plate. One of the lock pin and lock plate is attached to the main body or boom and the other of the lock pin and lock plate is attached to the other of the main body and boom. The lock plate comprises a hook which may engage with the lock pin and thereby secure the boom to the main body. The lock plate is attached to the main body or boom about a pivot and an operation lever is attached to the lock plate. The operation lever is used to move the lock plate about the pivot, thereby engaging and disengaging the lock plate from the lock pin.

[0004] In order to improve the stability of the work machine, a work tool will preferably be locked in a position wherein its centre of mass is as close to the main body of the work machine as possible. However, if the work tool is pivotally attached to the main body, this may result in the top of the work tool being raised to a considerable height from the ground. Different national regulations throughout the world set differing maximum heights for the top of the work machine and work tool.

[0005] The work tool lock disclosed in US-A-2009-0107015 enables the boom to be secured in only one position and, therefore, the height of the top of the boom is fixed. The apparatus does not enable the height

to be manually adjusted to meet differing national regulations. As a result, the size and design of work machines fitted with such a work tool lock must be adapted for each different regulatory height requirement.

[0006] GB-A-981395 discloses a latch for securing a skip body on a dumper vehicle. The latch comprises a fixed member and a movable member which are biased into a closed position by a spring. The members comprise slots and notches for securing a bar attached to the skip body in the closed position. The movable member can be turned about a pivot by a handle to release the bar as the two members separate from one another. This document constitutes the basis for the preamble of the independent claim.

Summary

[0007] The disclosure provides a work tool lock extension configured to interlock with a work tool lock for securing a work tool on a work machine, the work tool lock comprising first and second complementary interlocking means; the work tool lock extension comprising at least one extension member having first and second engagement means, said first engagement means being configured to interlock with the second interlocking means of a work tool lock and said second engagement means being configured to interlock with the first interlocking means of a work tool lock, such that when inserted into a work tool lock the extension member separates the first and second interlocking means.

[0008] The disclosure further provides a work machine comprising:- a work tool lock, said work tool lock comprising first and second complementary interlocking means; and a work tool lock extension as provided above; wherein the first engagement means of the work tool lock extension are configured to interlock with the second interlocking means and the second engagement means are configured to interlock with the first interlocking means, such that, when the work tool lock extension is inserted into the work tool lock, the extension member separates the first and second interlocking means.

[0009] By way of example only, embodiments of a work tool lock extension are now described with reference to, and as show in, the accompanying drawings.

Brief Description of the Drawings

[0010]

Figure 1 is a side elevation of one type of work machine suitable for the use of the work tool lock extension of the present disclosure;

Figure 2 is a perspective view of a disengaged work tool lock of the prior art suitable for interlocking with the work tool lock extension of the present disclosure;

Figure 3 is a perspective view of the work tool lock of Figure 2 when engaged;

Figure 4 is a perspective view of the work tool lock extension of the present disclosure;

Figure 5 is a perspective view of the underside of an extension member of the work tool lock extension of Figure 4;

Figure 6 is a perspective view of the underside of the extension member of Figure 5 with a support and a side plate hidden from view;

Figure 7 is a perspective view of the work tool lock of Figures 2 and 3 interlocked with the work tool lock extension of the present disclosure; and

Figure 8 is a perspective view of the arrangement of Figure 7 with a part of a boom, a side plate and a fastener hidden from view.

Detailed Description

[0011] The present disclosure is directed towards a work tool lock extension for use on a work machine with a work tool lock for securing the work tool in a storage position. The work tool lock may comprise first and second interlocking means attached to a main body of the work machine and/or to a work tool for securing a work tool in a storage position. The work tool lock extension comprises first and second engaging means, between which may be located an extension member, for interlocking with the first and second interlocking means. When the work tool lock extension is interlocked with the work tool lock, the height of the work tool in the secure storage position may be reduced in comparison to the height when only the work tool lock is engaged.

[0012] Figure 1 illustrates an exemplary work machine 10 comprising work tools 11, 12 and a main body 13. In the illustrated embodiment the work machine 10 is a backhoe loader, the work tool 11 is a loader and the work tool 12 is a backhoe. The work tools 11, 12 may comprise a boom 14, 15, a stick 16, 17 pivotally attached to the respective boom 14, 15 and a work implement 18, 19, in this example a bucket, pivotally attached to the respective sticks 16, 17. The boom 15 of the loader may be pivotally mounted on the main body 13 and the boom 14 of the backhoe may be pivotally mounted on a swing frame 20 forming part of the main body 13.

[0013] The movement of each of the work tools 11, 12 may be controlled using a hydraulic or electric system, which may comprise one or more actuators 21, 22, 23, 24, 25 attached to each of the main body 13, booms 14, 15, sticks 16, 17, work implements 18, 19 and swing frame 20.

[0014] In the illustrated embodiment, a work tool lock 26 is provided between the boom 14 and swing frame 20 and may be used to secure the work tool 12 in a storage position. In the case of the backhoe, the storage position is when the boom 14 is held substantially vertical in an upright position. Alternatively, as is well known, a work tool lock may be provided between any part of a work tool 11, 12 and any other part of the work tool 11, 12 or the main body 13 of the work machine 10. For example,

a work tool lock may be provided in between the sticks 16, 17 and the work implements 18, 19.

[0015] Figure 2 illustrates in greater detail the exemplary work tool lock 26, comprising first interlocking means 27, 28, which may comprise a pair of hook members, pivotally mounted to the swing frame 20 and second interlocking means 29, 30, which may comprise a pair of pins, attached to the boom 14. The illustrated work tool lock 26 is commonly known as a "boom lock". The boom 14 may be attached to the swing frame 20 at a pivot 31, about which the boom 14 is capable of moving relative to the main body 13. To secure the boom 14 in a storage position, the first interlocking means 27, 28 may be interlocked with the second interlocking means 29, 30, as illustrated in Figure 3, with the hook members hooked over the pins. The movement of the first interlocking means 27, 28 may be controlled by a handle 32 and/or by a hydraulic or electrical actuator 33 attached thereto. In one embodiment the first interlocking means 27, 28 may be mounted on the boom 14 and the second interlocking means 29, 30 may be mounted on the swing frame 20.

[0016] Figures 4 to 6 illustrate a work tool lock extension 34 of the present disclosure, comprising a connecting pin 35, an extension member 36 and one or more fasteners 37, 38.

[0017] The connecting pin 35 may be a solid bar with a circular cross section, although in other embodiments the cross section may be of another shape, such as a square or triangle. One or more through holes 40, 41, configured for receiving the fasteners 37, 38, may extend through the entire diameter of, and may be located substantially adjacent to one or both ends of, the connecting pin 35. In embodiments comprising more than one through holes 40, 41, each may be parallel to another. The illustrated fasteners 37, 38 are lynch pins, however, the fasteners 37, 38 may be any other type of suitable mechanical fastener, for example cylindrical rods, nuts and bolts, split pins, spring pins, R-clips or hitch pins. The through holes 40, 41 and fasteners 37, 38 may form locking means for the connecting pin 35 for securing the connecting pin 35 in the extension member 36.

[0018] The extension member 36 may be comprised of a central plate 42 provided between two side plates 43, 44, which may be joined together, for example using mechanical fasteners or by welding, or the central plate 42 and side plates 43, 44 may be formed as a single part. In Figure 6 the side plate 44 has been omitted, thereby showing the side plate 43 and central plate 42 in more detail. The central plate 42 may be substantially "T" shaped and may have a width substantially similar to the width of the first interlocking means 27, 28. A first engagement means 39, for example a hook formed in a part of the periphery of the central plate 42 not enclosed by the side plates 43, 44, may be provided in the extension member 36 for interlocking with second interlocking means 29, 30. The two side plates 43, 44 may be identical and may substantially overhang the edges of opposing

sides of the central plate 42, defining a recess 45 therebetween. A support 46 may be provided between apertures 47, 48 in the free sides of the two side plates 43, 44 to maintain the shape of the recess 45 if the extension member 36 is knocked or damaged.

[0019] One or more openings 49, 50 may be provided in the extension member 36 adjacent to the recess 45 and may be configured for the insertion of the connecting pin 35, which, when inserted into the openings 49, 50, will cross between the side plates 43, 44 through the recess 45. In one embodiment two openings 49, 50 may be provided opposite one another in each side plate 43, 44. The length of the connecting pin 35 may be greater than the width of the extension member 36. The one or more through holes 40, 41 may be located such that, when the connecting pin 35 is inserted through the openings 49, 50, the one or more fasteners 37, 38 may be inserted into the one or more through holes 40, 41 on the outer side of the extension member 36. The fasteners 37, 38 secure the connecting pin 35 in place by preventing it from sliding out of the openings 49, 50. In one embodiment, one end of the connecting pin 35 may comprise a disc, the disc having a large diameter than the connecting pin 35, and the other end of the connected pin 35 may comprise a single through hole for the insertion of a single fastener. The disc may act as a stop to prevent the connecting pin 35 from sliding out of position.

[0020] The recess 40 and connecting pin 35 may form a second engagement means for engaging or interlocking with the first interlocking means 27, 28. In one embodiment, wherein the first interlocking means 27, 28 comprise a hook, the second engagement means are configured so that the hook may have a close fit with the recess 40 and interlock with the connecting pin 35.

Industrial Applicability

[0021] The work machine of the present disclosure may be a work vehicle and may be of any type, some examples of which are backhoe loaders, excavators, dozers, track loaders, bulldozers and wheel loaders. The work tool may comprise one or more booms, sticks, arms and/or work implements, each of which may be pivotally attached to another part of the work tool or to a main body of the work machine. The work implements may be of any type, examples of which include buckets, shovels, grapples, shears, saws, forks, augurs or material handling arms. The work tool may also be of any type, including, for example, backhoes, loaders, excavators, material handler front linkages and the like.

[0022] Figure 7 illustrates two work tool lock extensions 34 in use securing a boom 14 in a storage position. Each of the work tool lock extensions 34 is interlocked with one of the first interlocking means 27, 28 of the work tool lock 26 and one of the second interlocking means 29, 30 of the work machine 10. Figure 8 illustrates the same arrangement, except a side plate 44 and fastener 38 on one of the work tool lock extensions 34 and a part of the

boom 14 are not shown.

[0023] The extension member 36 may initially be placed on the first interlocking means 27, 28 by inserting the first interlocking means 27, 28 into the recess 45. The connecting pin 35 may then be inserted through the openings 49, 50 and secured by the fasteners 37, 38 inserted through the through holes 39, 40. The first interlocking means 27, 28 are thereby interlocked with the second engagement means, and may not be able to be unlocked unless the connecting pin 35 is removed. The work tool 12 may then be moved into an upright position and the first engagement means 39 may be interlocked with the second interlocking means 29, 30 using either the handle 32 or the actuator 33. The first and second interlocking means 27, 28, 29, 30 are thereby separated by the extension member 36 and the work tool 12 is securely held in a storage position.

[0024] In comparison to the effect of engaging the work tool locks 26 only, the work tool lock extensions 34 increase the distance between the work tool 12 and the main body 13 of the work machine 10 when the work tool 12 is in the storage position. As a result, the height of the top of the work tool 12 is lower. Identically designed work machines 10 may therefore be designed regardless of differing national height regulations. Different sized work tool lock extensions 34 may be provided to adapt the height of the work tool 10 to suit the differing height regulations. This may enable the work machine 10 to be driven on roads anywhere in the world with the work tool 10 secured in the storage position.

[0025] When the work tool 12 is not secured in the storage position, or there is no requirement to reduce the height of the work tool 12, the work tool lock extensions 34 may be removed and stored for later use.

Claims

1. A work tool lock extension (34) configured to interlock with a work tool lock (26) for securing a work tool (11, 12) on a work machine (10), the work tool lock (26) comprising first and second complementary interlocking means (27, 28, 29, 30); **characterised by** the work tool lock extension (34) comprising at least one extension member (36) having first and second engagement means (39), said first engagement means (39) being configured to interlock with the second interlocking means (29, 30) of a work tool lock (26) and said second engagement means being configured to interlock with the first interlocking means (27, 28) of a work tool lock (26), such that when inserted into a work tool lock (26) the extension member (36) separates the first and second interlocking means (27, 28, 29, 30).
2. A work tool lock extension (34) as claimed in claim 1 wherein the first engagement means (39) compris-

es at least one hook and the second engagement means comprises at least one removable pin (35).

3. A work tool lock extension (34) as claimed in claim 1 or claim 2 in which the at least one extension member (36) defines a recess (45) configured for receiving the second interlocking means (29, 30) of a work tool lock (26).
4. A work tool lock extension (34) as claimed in claim 3 wherein the extension member (36) comprises a central plate (42) partially located between two side plates (43, 44) with the recess (45) extending between the two side plates (43, 44).
5. A work tool lock extension (34) as claimed in claim 3 or claim 4 wherein the pin (35), when inserted in the extension member (36), extends across the inside of the recess (45).
6. A work tool lock extension (34) as claimed in any one of claims 2 to 5 wherein the extension member (36) comprises at least one opening (49, 50) extending through the extension member (36) for receiving the pin (35).
7. A work tool lock extension (34) as claimed in any one of claims 2 to 6 in which the pin (35) further comprises locking means for securing the pin (35) in the extension member (36).
8. A work tool lock extension (34) as claimed in any one of claim 2 to 7 wherein the at least one hook is formed in the central plate (42).
9. A work machine (10) comprising:-

a work tool lock (26), said work tool lock (26) comprising first and second complementary interlocking means (27, 28, 29, 30); and

a work tool lock extension (34) as claimed in any one of the preceding claims;

wherein the first engagement means (39) of the work tool lock extension (34) are configured to interlock with the second interlocking means (29, 30) and the second engagement means are configured to interlock with the first interlocking means (27, 28), such that, when the work tool lock extension (34) is inserted into the work tool lock (26), the extension member (36) separates the first and second interlocking means (27, 28, 29, 30).
10. A work machine (10) as claimed in claim 9 wherein the first interlocking means (27, 28) comprises at least one hook and the second interlocking means comprises at least one pin (35).

11. A work machine (10) as claimed in claim 9 or claim 10 wherein the work machine (10) is a backhoe loader.

12. A work machine (10) as claimed in claim 11 further comprising a work tool (11, 12) wherein the work tool (11, 12) is a backhoe mounted on a swing frame (20) and the work tool lock (26) is for securing the backhoe to the swing frame (20).

Patentansprüche

1. Verriegelbare Verlängerung für ein Arbeitswerkzeug (34), welche dazu eingerichtet ist, mit einer Verriegelung für ein Arbeitswerkzeug (26) zum Sichern eines Arbeitswerkzeugs (11, 12) an einer Arbeitsmaschine (10) verriegelt zu werden, wobei die Verriegelung für ein Arbeitswerkzeug (26) erste und zweite sich gegenseitig ergänzende Verriegelungsmittel (27, 28, 29, 30) umfasst; **dadurch gekennzeichnet, dass** die verriegelbare Verlängerung für ein Arbeitswerkzeug (34) wenigstens ein Verlängerungselement (36) umfasst, welches erste und zweite Eingriffsmittel (39) aufweist, wobei die ersten Eingriffsmittel (39) dazu eingerichtet sind, mit den zweiten Verriegelungsmitteln (29, 30) einer Verriegelung für ein Arbeitswerkzeug (26) verriegelt zu werden und die zweiten Eingriffsmittel dazu eingerichtet sind, mit den ersten Verriegelungsmitteln (27, 28) einer Verriegelung für ein Arbeitswerkzeug (26) verriegelt zu werden, so dass, wenn sie in eine Verriegelung für ein Arbeitswerkzeug (26) eingesetzt ist, das Verlängerungselement (36) die ersten und zweiten Verriegelungsmittel (27, 28, 29, 30) trennt.
2. Verriegelbare Verlängerung für ein Arbeitswerkzeug (34) nach Anspruch 1, wobei die ersten Eingriffsmittel (39) wenigstens einen Haken umfassen und die zweiten Eingriffsmittel wenigstens einen entfernbaren Stift (35) umfassen.
3. Verriegelbare Verlängerung für ein Arbeitswerkzeug (34) nach Anspruch 1 oder Anspruch 2, in welcher wenigstens ein Verlängerungselement (36) eine Ausnehmung (45) definiert, welche zum Aufnehmen der zweiten Verriegelungsmittel (29, 30) einer Verriegelung für ein Arbeitswerkzeug (26) eingerichtet ist.
4. Verriegelbare Verlängerung für ein Arbeitswerkzeug (34) nach Anspruch 3, wobei das Verlängerungselement (36) eine zentrale Platte (42) umfasst, welche teilweise zwischen zwei Seitenplatten (43, 44) angeordnet ist, wobei die Ausnehmung (45) sich zwischen den zwei Seitenplatten (43, 44) erstreckt.

5. Verriegelbare Verlängerung für ein Arbeitswerkzeug (34) nach Anspruch 3 oder Anspruch 4, wobei sich der Stift (35), wenn er in das Verlängerungselement (36) eingesetzt ist, über das Innere der Ausnehmung (45) erstreckt. 5
6. Verriegelbare Verlängerung für ein Arbeitswerkzeug (34) nach einem der Ansprüche 2 bis 5, wobei das Verlängerungselement (36) wenigstens eine Öffnung (49, 50) umfasst, welche sich durch das Verlängerungselement (36) erstreckt, um den Stift (35) aufzunehmen.
7. Verriegelbare Verlängerung für ein Arbeitswerkzeug (34) nach einem der Ansprüche 2 bis 6, in welcher der Stift (35) ferner Verriegelungsmittel zum Sichern des Stifts (35) in dem Verlängerungselement (36) umfasst.
8. Verriegelbare Verlängerung für ein Arbeitswerkzeug (34) nach einem der Ansprüche 2 bis 7, wobei der wenigstens eine Haken in der zentralen Platte (42) gebildet ist. 20
9. Arbeitsmaschine (10) umfassend: 25
 - eine Verriegelung für ein Arbeitswerkzeug (26), wobei die Verriegelung für ein Arbeitswerkzeug (26) erste und zweite sich gegenseitig ergänzende Verriegelungsmittel (27, 28, 29, 30) umfasst; und 30
 - eine verriegelbare Verlängerung für ein Arbeitswerkzeug (34) nach einem der vorhergehenden Ansprüche; 35
 - wobei die ersten Eingriffsmittel (39) der verriegelbaren Verlängerung für ein Arbeitswerkzeug (34) dazu eingerichtet sind, mit den zweiten Verriegelungsmitteln (29, 30) verriegelt zu werden und die zweiten Eingriffsmittel dazu eingerichtet sind, mit den ersten Verriegelungsmitteln (27, 28) verriegelt zu werden, so dass, wenn die verriegelbare Verlängerung für ein Arbeitswerkzeug (34) in die Verriegelung für ein Arbeitswerkzeug (26) eingesetzt ist, das Verlängerungselement (36) die ersten und zweiten Verriegelungsmittel (27, 28, 29, 30) trennt. 40 45
10. Arbeitsmaschine (10) nach Anspruch 9, wobei die ersten Verriegelungsmittel (27, 28) wenigstens einen Haken umfassen und die zweiten Verriegelungsmittel wenigstens einen Stift (35) umfassen. 50
11. Arbeitsmaschine (10) nach Anspruch 9 oder Anspruch 10, wobei die Arbeitsmaschine (10) ein Baggerlader ist. 55
12. Arbeitsmaschine (10) nach Anspruch 11 ferner ein Arbeitswerkzeug (11, 12) umfassend, wobei das Ar-

beitswerkzeug (11, 12) ein Baggerlader ist, welcher an einem Schwenkrahmen (20) angebracht ist und die Verriegelung für ein Arbeitswerkzeug (26) zum Sichern des Baggerladers an dem Schwenkrahmen (20) vorgesehen ist.

Revendications

1. Extension de verrou d'outil de travail (34) configurée pour s'enclencher avec un verrou d'outil de travail (26) pour fixer un outil de travail (11, 12) sur une machine de travail (10), le verrou d'outil de travail (26) comprenant des premiers et deuxièmes moyens d'enclenchement complémentaires (27, 28, 29, 30) ; **caractérisée par** l'extension de verrou d'outil de travail (34) comprenant au moins un élément d'extension (36) ayant des premiers et deuxièmes moyens d'engagement (39), lesdits premiers moyens d'engagement (39) étant configurés pour s'enclencher avec les deuxièmes moyens d'enclenchement (29, 30) d'un verrou d'outil de travail (26) et lesdits deuxièmes moyens d'engagement étant configurés pour s'enclencher avec les premiers moyens d'enclenchement (27, 28) d'un verrou d'outil de travail (26), de sorte que, lors de son insertion dans un verrou d'outil de travail (26), l'élément d'extension (36) sépare les premiers et deuxièmes moyens d'enclenchement (27, 28, 29, 30). 10
2. Extension de verrou d'outil de travail (34) telle que revendiquée dans la revendication 1, dans laquelle les premiers moyens d'engagement (39) comprennent au moins un crochet et les deuxièmes moyens d'engagement comprennent au moins une broche amovible (35). 15
3. Extension de verrou d'outil de travail (34) telle que revendiquée dans la revendication 1 ou 2, dans laquelle l'au moins un élément d'extension (36) définit un évidement (45) configuré pour recevoir les deuxièmes moyens d'enclenchement (29, 30) d'un verrou d'outil de travail (26). 20
4. Extension de verrou d'outil de travail (34) telle que revendiquée dans la revendication 3, dans laquelle l'élément d'extension (36) comprend une plaque centrale (42) partiellement située entre deux plaques latérales (43, 44) avec l'évidement (45) s'étendant entre les deux plaques latérales (43, 44). 25
5. Extension de verrou d'outil de travail (34) telle que revendiquée dans la revendication 3 ou 4, dans laquelle la broche (35), lors de son insertion dans l'élément d'extension (36), s'étend à travers l'intérieur de l'évidement (45). 30 35 40 45 50 55

6. Extension de verrou d'outil de travail (34) telle que revendiquée dans l'une quelconque des revendications 2 à 5, dans laquelle l'élément d'extension (36) comprend au moins une ouverture (49, 50) s'étendant à travers l'élément d'extension (36) pour recevoir la broche (35). 5

7. Extension de verrou d'outil de travail (34) telle que revendiquée dans l'une quelconque des revendications 2 à 6, dans laquelle la broche (35) comprend en outre un moyen de verrouillage pour fixer la broche (35) dans l'élément d'extension (36). 10

8. Extension de verrou d'outil de travail (34) telle que revendiquée dans l'une quelconque des revendications 2 à 7, dans laquelle l'au moins un crochet est formé dans la plaque centrale (42). 15

9. Machine de travail (10) comprenant : 20
 - un verrou d'outil de travail (26), ledit verrou d'outil de travail (26) comprenant des premiers et deuxièmes moyens d'enclenchement complémentaires (27, 28, 29, 30) ; et
 - une extension de verrou d'outil de travail (34) 25
 - telle que revendiquée dans l'une quelconque des revendications précédentes ;
 - dans laquelle les premiers moyens d'engagement (39) de l'extension de verrou d'outil de travail (34) sont configurés pour s'enclencher avec les deuxièmes moyens d'enclenchement (29, 30) et les deuxièmes moyens d'engagement 30
 - sont configurés pour s'enclencher avec les premiers moyens d'enclenchement (27, 28), de sorte que, lorsque l'extension de verrou d'outil de 35
 - travail (34) est insérée dans le verrou d'outil de travail (26), l'élément d'extension (36) sépare les premiers et deuxièmes moyens d'enclenchement (27, 28, 29, 30). 40

10. Machine de travail (10) telle que revendiquée dans la revendication 9, dans laquelle les premiers moyens d'enclenchement (27, 28) comprennent au moins un crochet et les deuxièmes moyens d'enclenchement comprennent au moins une broche (35). 45

11. Machine de travail (10) telle que revendiquée dans la revendication 9 ou 10, dans laquelle la machine de travail (10) est une chargeuse-pelleteuse. 50

12. Machine de travail (10) telle que revendiquée dans la revendication 11, comprenant en outre un outil de travail (11, 12), dans laquelle l'outil de travail (11, 12) est une pelleteuse montée sur un châssis oscillant (20) et le verrou d'outil de travail (26) est pour fixer la pelleteuse au châssis oscillant (20). 55

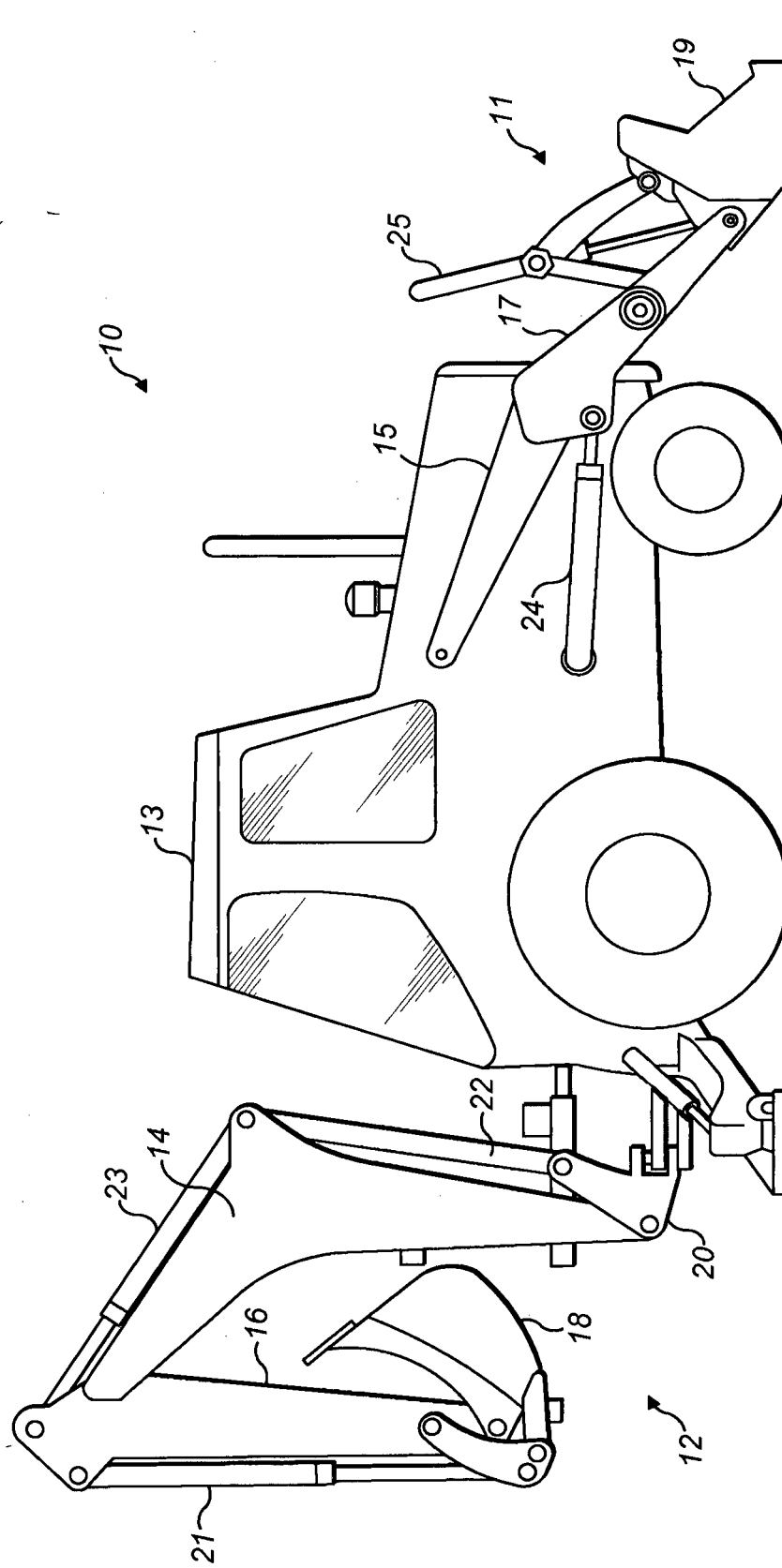


FIG. 1

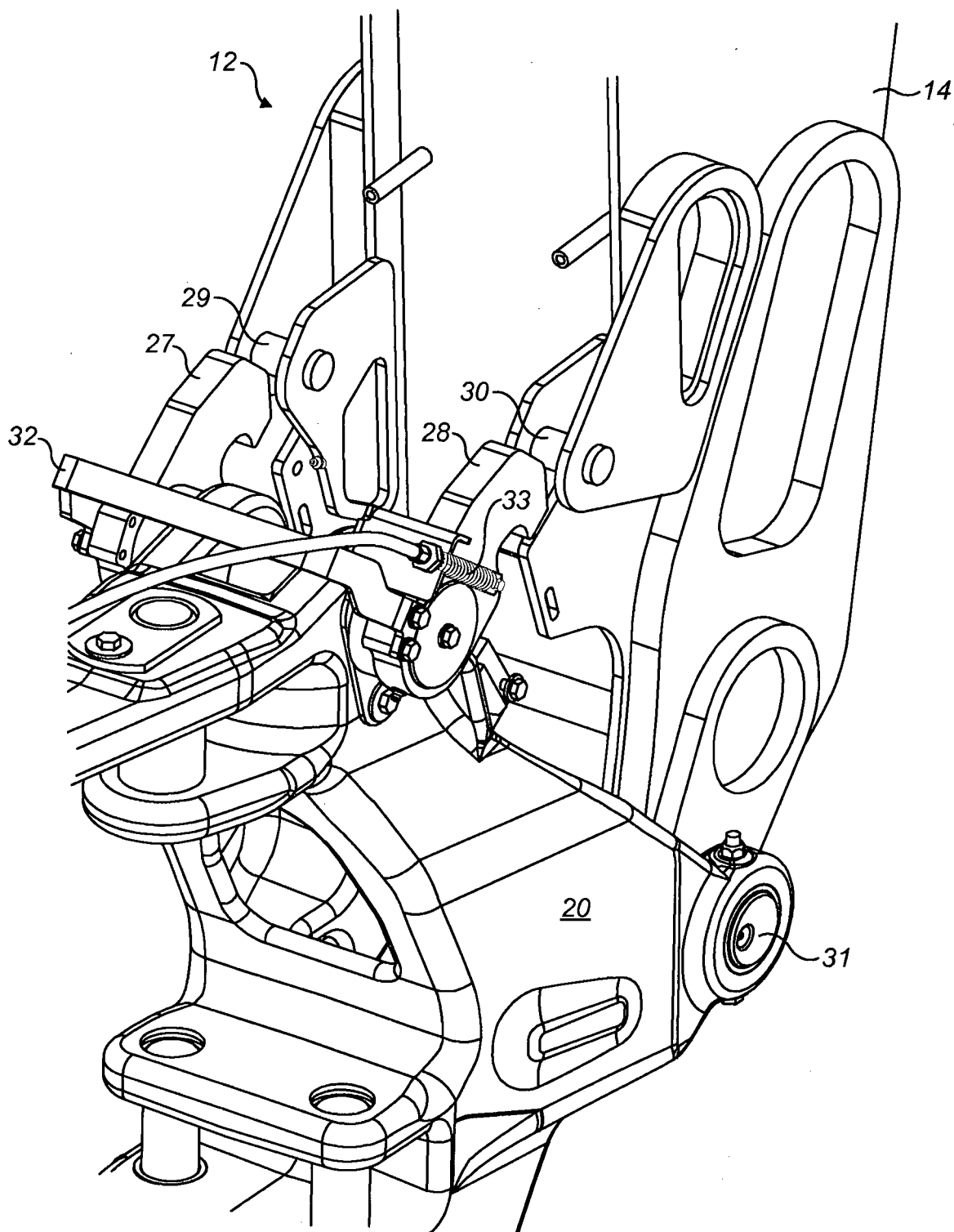


FIG. 2

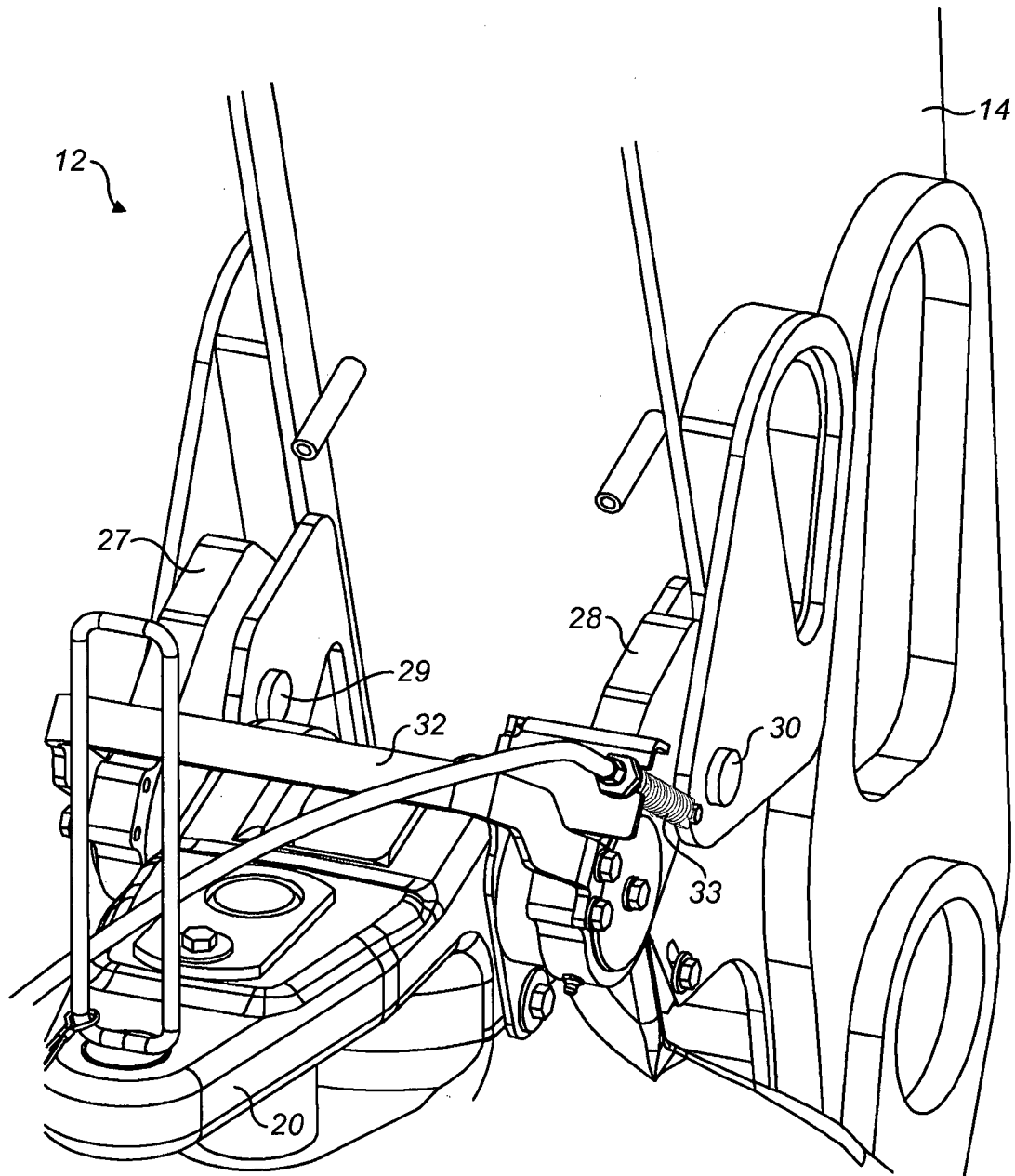


FIG. 3

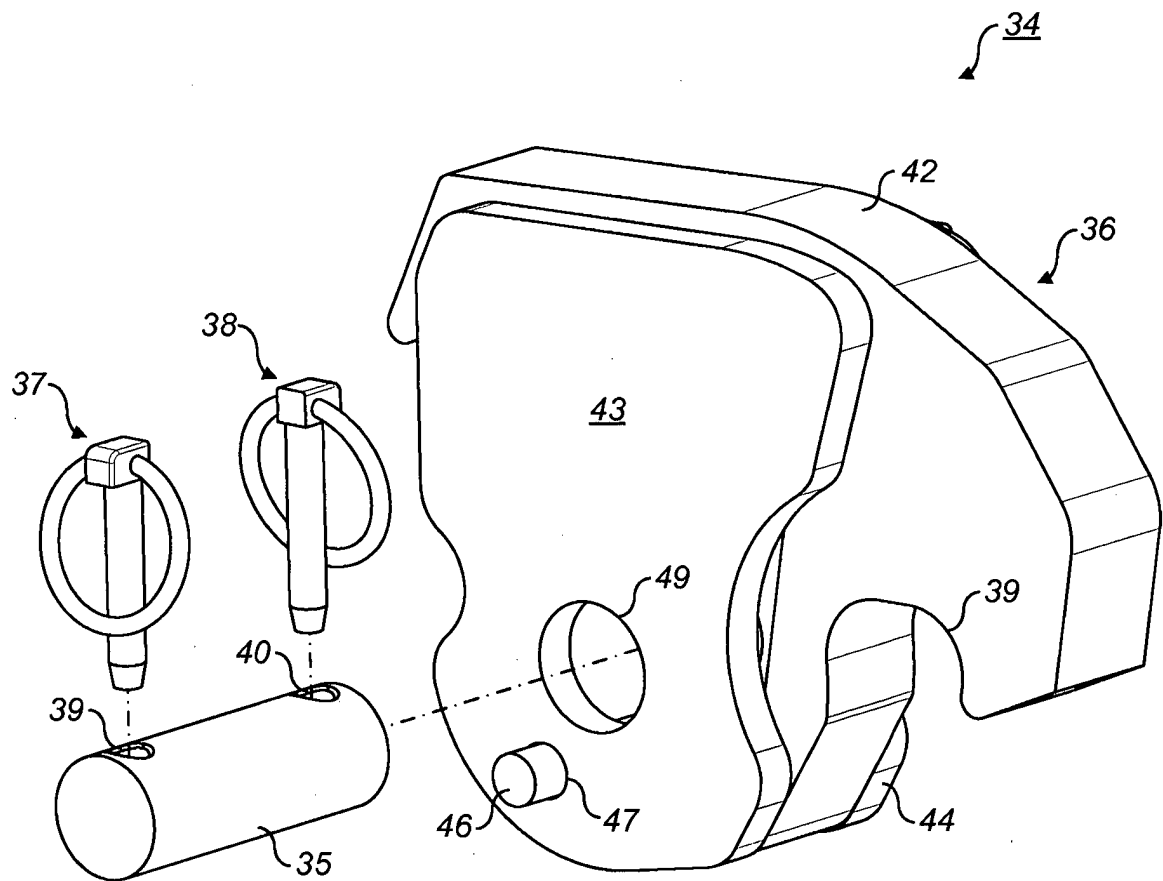


FIG. 4

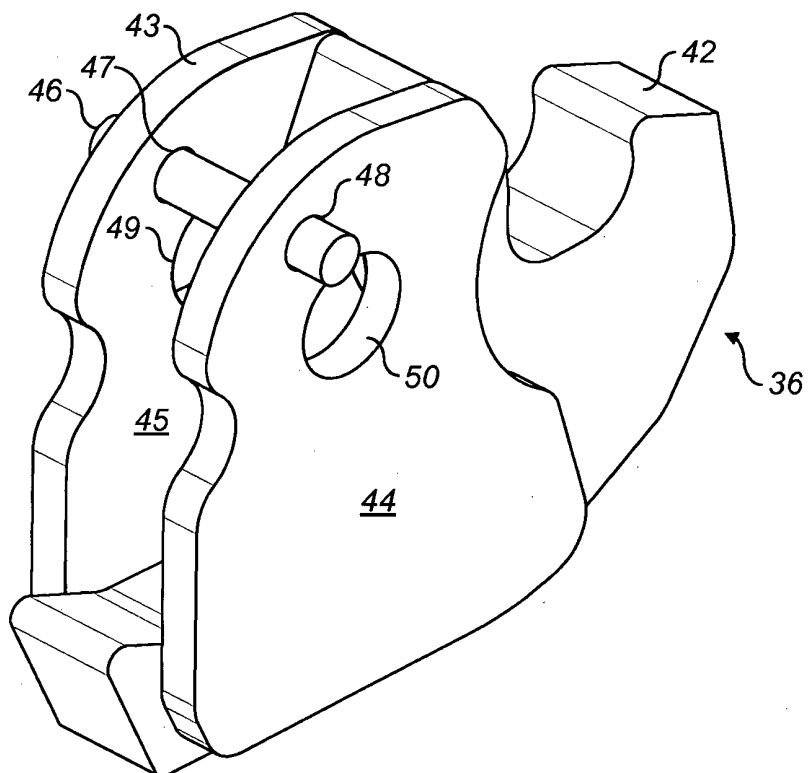


FIG. 5

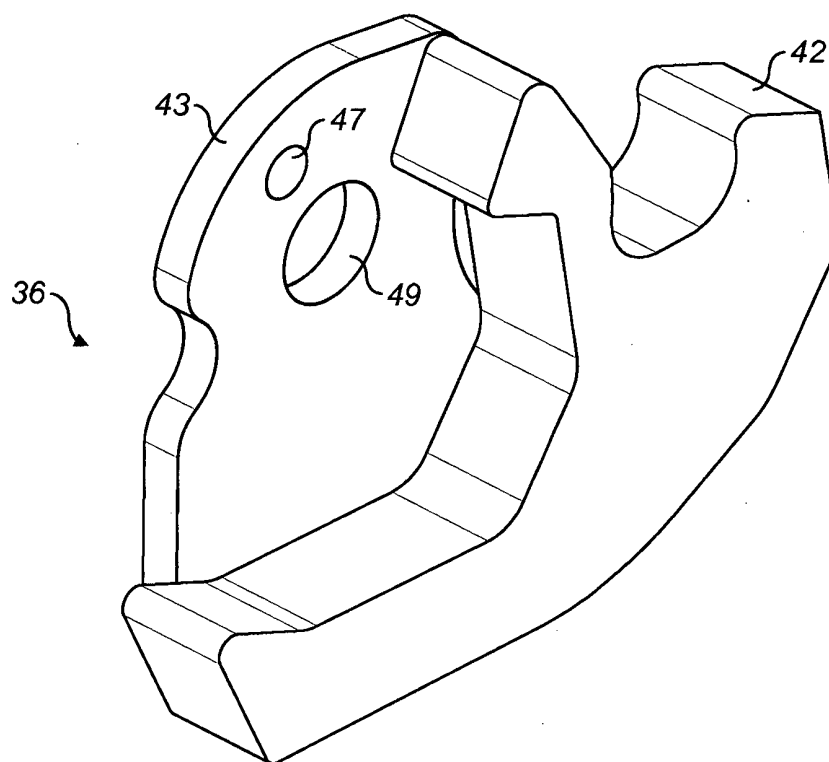


FIG. 6

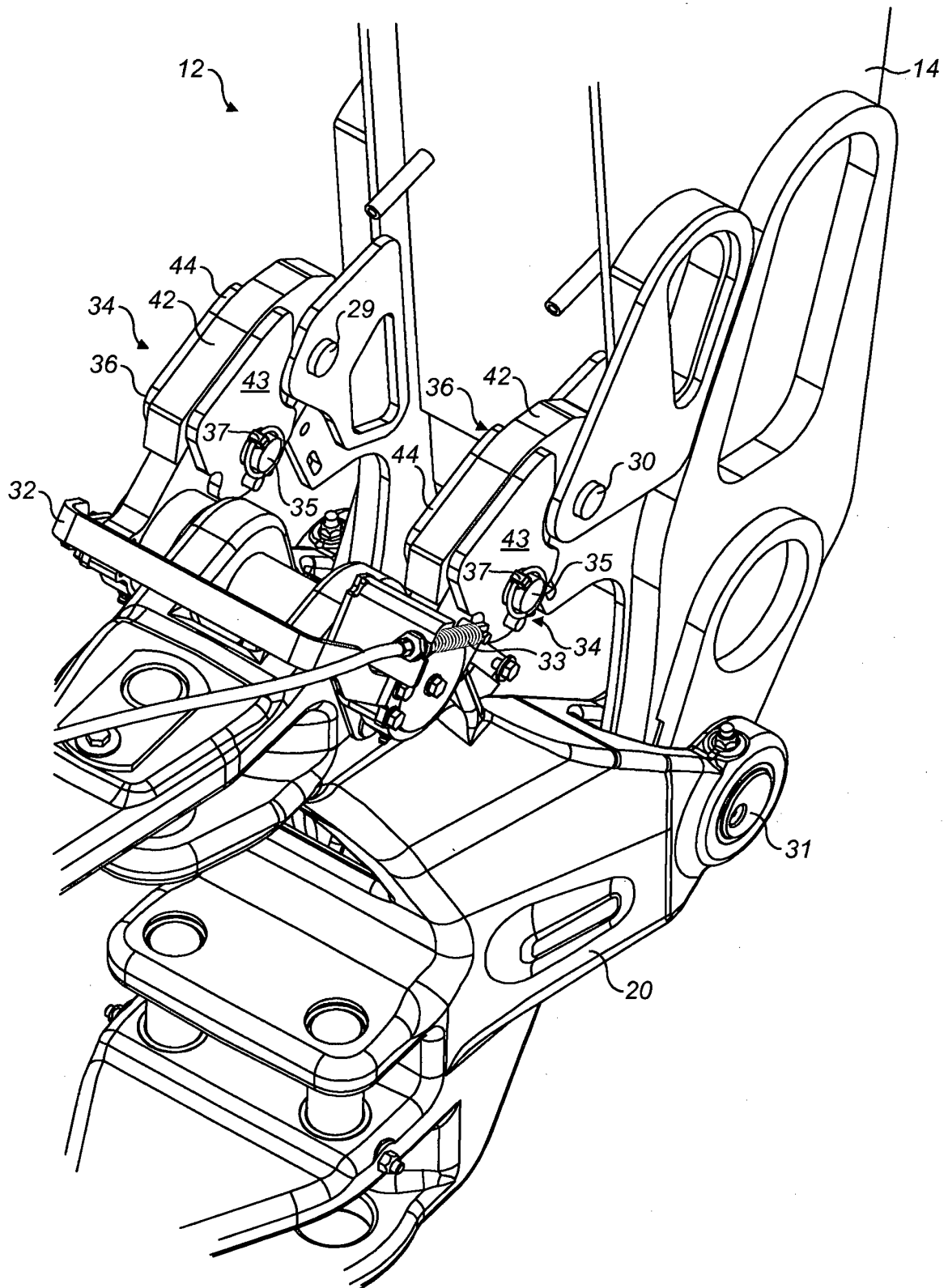


FIG. 7

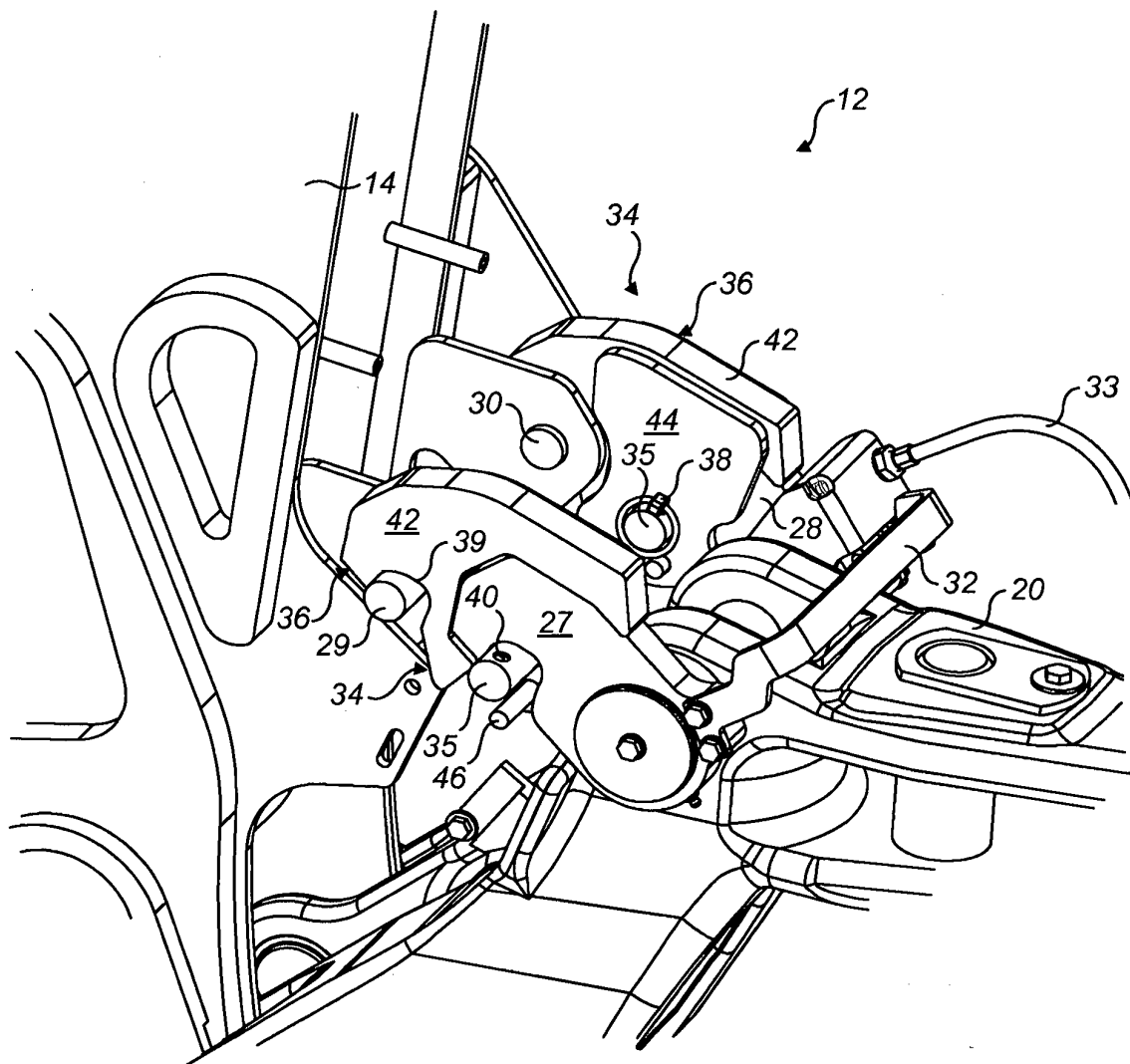


FIG. 8

REFERENCES CITED IN THE DESCRIPTION

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