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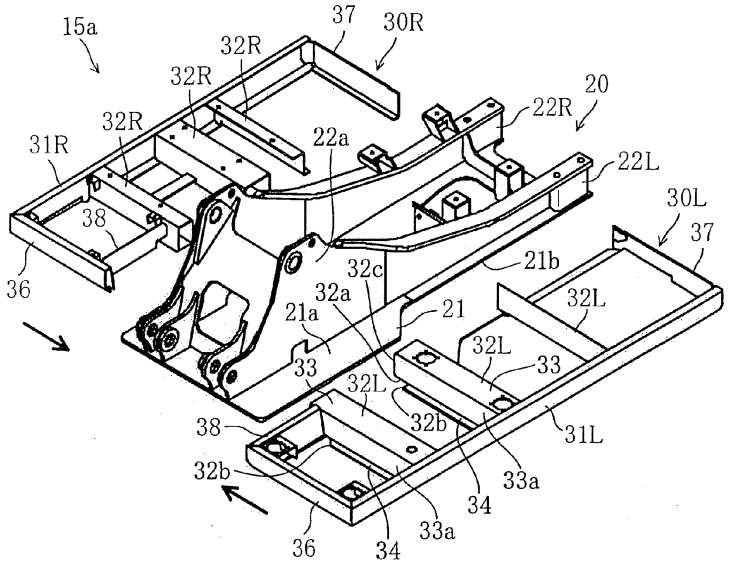
(54) Set of members forming upper frame of construction machine

(57) A set of members (15a) forming an upper frame (15) of a construction machine 10) includes a center section (20), a left side deck (30L), and a right side deck (30R). The left side deck (30L) has a left deck beam (32). The right side deck (30R) has a right deck beam (32R). At least one of the left deck beam (32L) or the right deck beam (32R) is adjustment deck beams. The adjustment deck beam (32R, 32L) has a contacting part(32c) that is adapted to be brought into contact with and is also adapted to be welded to an external side surface (22a) of an adjustment-side longitudinal plate (22L), a first opposing part (32b) that is adapted to be opposed to a side surface (21b) of the bottom plate (21) and is also adapted to be welded to the side surface (21b), and a second opposing part (32a) that is adapted to be opposed to an upper surface (21a) of the bottom plate with a height-adjustment gap therebetween.

FIG.2



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(Cont. next page)

FIG.4

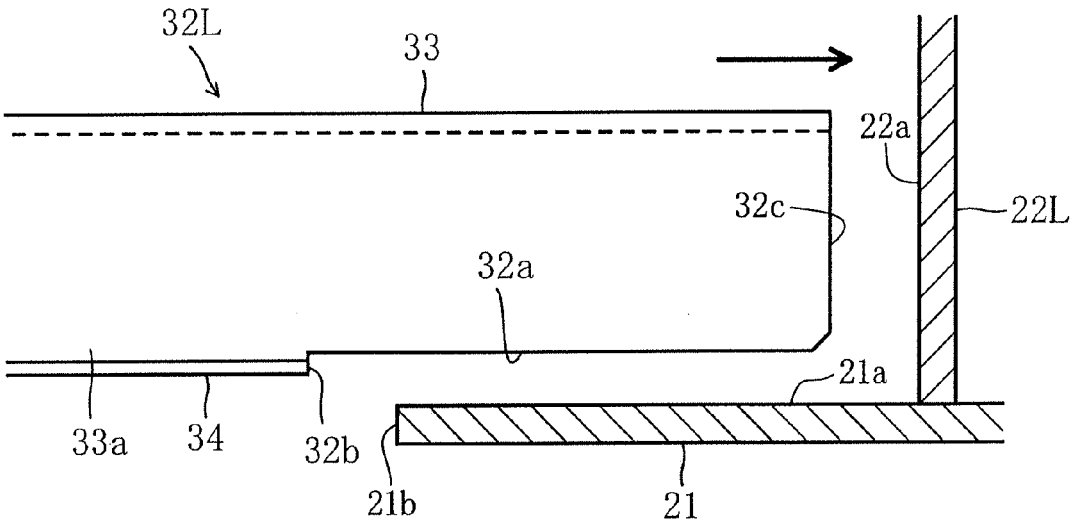
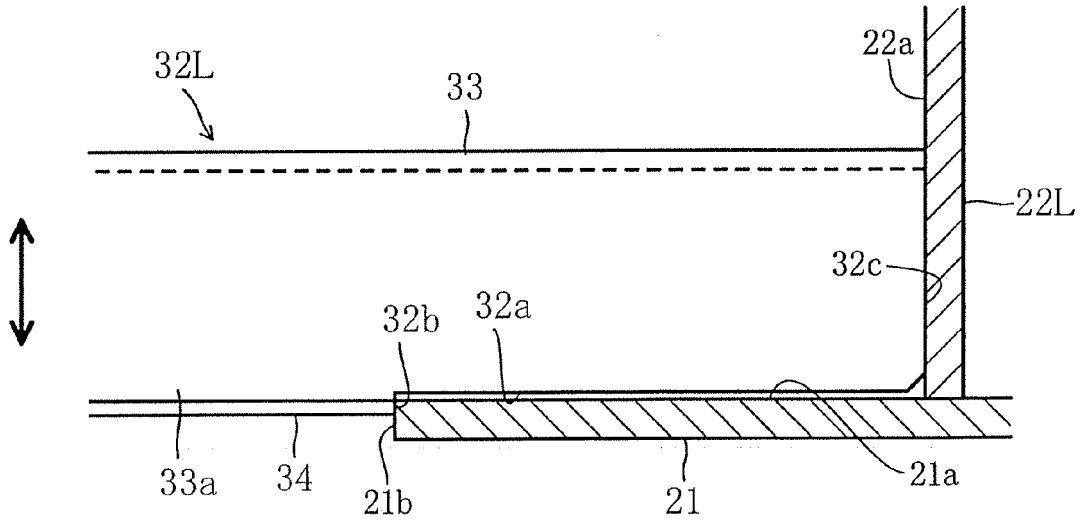

32L
33
22a
22L
32c
32a
21a
33a
34
32b
21b
21

FIG.5


32L
33
22a
22L
32c
32b
32a
33a
34
21b
21
21a

Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to a set of members forming an upper frame of a construction machine.

2. Description of the Related Art

[0002] Conventionally, there is known an upper frame of a construction machine that includes a center section to which a working device is fitted and side decks which are provided at left and right sides of the center section (refer to Japanese Patent Application Laid-open No. 2007-030866, for example).

[0003] The center section has a bottom plate, and a pair of left and right longitudinal plates that are erected at inner sides than left and right edge parts of the bottom plate and that are extended in a front and rear direction. Each side deck has a side frame extended in a front and rear direction, and deck beams for coupling the side frame to the center section.

[0004] In coupling the deck beams of the side decks to respective longitudinal plates of the center section, the longitudinal plates and the deck beams need to be welded together after height positions of the side decks to the center section are adjusted.

[0005] Specifically, the side decks are combined with the center section, and front end parts of the deck beams are brought into contact with external side surfaces of the longitudinal plates. Next, adjusting plates for adjusting heights arc welded to lower parts of the deck beams while the adjusting plates are being brought into contact with a side surface of the bottom plate of the center section. Consequently, the side decks become slidable in a height direction along contact surfaces between the deck beams and the longitudinal plates and along contact surfaces between the adjusting plates and the bottom plate. After the side decks are adjusted to proper height positions, contact portions between the front end parts of the deck beams and the external side surfaces of the longitudinal plates and contact portions between the adjusting plates and the side surface of the bottom plate are welded respectively, and an upper frame is configured as a result.

[0006] However, the upper frame of the conventional construction machine requires a work of welding the adjusting plates to the lower parts of the deck beams when performing a work of welding the side decks to the center section. Therefore, there has been a problem in that the welding work becomes complex and the number of parts increases resulting in a cost increase.

SUMMARY OF THE INVENTION

[0007] An object of the present invention is to provide a set of members forming an upper frame of a construction machine capable of improving working efficiency by facilitating adjustment of height positions of side decks to a center section in a simple configuration.

[0008] A set of members forming an upper frame of a construction machine according to one aspect of the present invention includes: a center section having a bottom plate, a left longitudinal plate erected at an inner side of a left edge part of the bottom plate, and a right longitudinal plate erected at an inner side of a right edge part of the bottom plate, the left longitudinal plate and the right longitudinal plate extended in a front and rear direction; a left side deck arranged at a left side of the center section; and a right side deck arranged at a right side of the center section. The left side deck has a left side frame extended in a front and rear direction, and a left deck beam for coupling the left side frame to the left longitudinal plate of the center section, and the right side deck has a right side frame extended in a front and rear direction, and a right deck beam for coupling the right side frame to the right longitudinal plate of the center section. At least one of the left deck beam or the right deck beam is an adjustment deck beam by which a height position relative to the center section can be adjusted. The adjustment deck beam has a contacting part that is adapted to be brought into contact with and is also adapted to be welded to an external side surface of an adjustment-side longitudinal plate opposing the adjustment deck beam out of the left longitudinal plate and the right longitudinal plate, a first opposing part that is adapted to be opposed to a side surface of the bottom plate and is also adapted to be welded to the side surface when the contacting part is brought into contact with the external side surface of the adjustment-side longitudinal plate, and a second opposing part that is adapted to be opposed to an upper surface of the bottom plate by having a height-adjustment gap in an up and down direction in a state where the contacting part is brought into contact with the external side surface of the adjustment-side longitudinal plate and also the first opposing part is opposed to the side surface of the bottom plate.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009]

Fig. 1 is a perspective view showing a configuration of a construction machine according to an embodiment of the present invention;

Fig. 2 is a perspective view showing a state before each side deck is combined to a center section (a set of members forming an upper frame of a construction machine);

Fig. 3 is a perspective view showing a state after each side deck is combined to the center section (the upper frame of the construction machine);

Fig. 4 is a cross-sectional view showing a state before a deck beam is combined to a longitudinal plate;

Fig. 5 is a cross-sectional view showing a state where

a height of a side deck is being adjusted;

Fig. 6 is a cross-sectional view showing a state where the side deck has been welded to the center section; and

Fig. 7 is a view corresponding to Fig. 5 showing a configuration of a deck beam according to a modification of the present embodiment.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0010] An embodiment of the present invention is described below with reference to the drawings. The following description of a preferred embodiment is essentially no more than description of exemplifications, and is not intended to limit the present invention and application or usage thereof. In Fig. 1, up and down, front and rear, and left and right directions are respectively indicated by arrowheads. Unless otherwise specifically stated, the up and down and other directions are described following the directions indicated by the arrowheads.

[0011] Fig. 1 is a perspective view showing a configuration of a construction machine according to the embodiment of the present invention. As shown in Fig. 1, a construction machine 10 includes a lower running body 11, and an upper rotating body 12 rotatably supported on the lower running body 11.

[0012] The upper rotating body 12 has an upper frame 15 that becomes a framework base thereof, a working machine 13 derrickably fitted to the upper frame 15 at a front end part of the upper frame 15, a counterweight 16 fitted to a rear end side of the upper frame 15 to take weight balance with the working machine 13, and a cab 17 arranged at a portion at a left front side of the upper frame 15.

[0013] The working machine 13 is for performing a digging operation and the like. The working machine 13 has a boom 13a having a base end part thereof turnably fitted to the upper rotating body 12, an arm 13b turnably fitted to a front end side of the boom 13a, and a bucket 13c turnably fitted to a front end side of the arm 13b. The boom 13a, the arm 13b, and the bucket 13c are respectively driven by a corresponding hydraulic cylinder 13d.

[0014] As shown in Fig. 2, a set of members 15a configuring the upper frame includes a center section 20 positioned at a central part in a vehicle width direction (a left and right direction), a left side deck 30L coupled to a left side of the center section 20, and a right side deck 30R coupled to a right side of the center section 20. Fig. 3 shows an upper frame 15 configured by having both the side decks 30L and 30R coupled to the center section 20.

[0015] The center section 20 has a bottom plate 21, and a left longitudinal plate 22L and a right longitudinal plate 22R that are erected at inner sides than left and right edge parts of the bottom plate 21 and are extended in a front and rear direction. The bottom plate 21 is formed by a thick steel plate. The longitudinal plates 22L and 22R are joined to the bottom plate 21 by welding.

[0016] The left side deck 30L has a left side frame 31L extended in a front and rear direction, and left deck beams 32L for coupling the left side frame 31 L to the left longitudinal plate 22L of the center section 20. The right side deck 30R has a right side frame 31R extended in a front and rear direction, and right deck beams 32R for coupling the right side frame 31R to the right longitudinal plate 22R of the center section 20. The left deck beams 32L and the right deck beams 32R are respectively arranged by three, each having a gap in a front and rear direction. Specifically, first deck beams 32L and 32R from the front respectively and second deck beams 32L and 32R from the front respectively have closed cross-sectional shapes. Third deck beams 32L and 32R from the front are respectively configured by erecting one plate material.

[0017] A front end part of each of the side frames 31 L and 31 R is provided with a front frame 3 6 that is extended from each of the side frames 31 L and 31 R toward a center section 20 side. A rear end part of each of the side frames 31 L and 31 R is provided with a rear frame 37 that is extended from each of the side frames 31L and 31 R toward a center section 20 side. Each front frame 36 and each front end part of the first deck beams 32L and 32R from the front respectively are coupled together by each coupling frame 38.

[0018] The side decks 30L and 30R are respectively combined to the center section 20. An end part of the left deck beam 32L at a left longitudinal plate 22L side is brought into contact with an external side surface 22a of the left longitudinal plate 22L, and at the same time, an end part of the right deck beam 32R at a right longitudinal plate 22R side is brought into contact with an external side surface of the right longitudinal plate 22R so that these components in a contact state are welded to one another, whereby the center section 20 and the side decks 30L and 30R are coupled together.

[0019] In welding the side decks 30L and 30R to the center section 20, height positions of the side decks 30L and 30R to the center section 20 need to be adjusted. By devising configurations of the deck beams 32L and 32R, adjustment of the height positions of the side decks 30L and 30R to the center section 20 is facilitated.

[0020] In the present embodiment, a configuration for facilitating height position adjustment relative to the center section 20 is employed in the left side deck 30L on which the cab 17 is mounted. That is, in the present embodiment, the left deck beams 32L configure "adjustment deck beams" by which a height position relative to the center section 20 can be adjusted. Hereinafter, only the left side deck 30L is described. A similar configuration may be also employed in the right side deck 30R.

[0021] In the left side deck 30L, a first left deck beam 32L from the front and a second left deck beam 32L from the front are formed in closed cross-sectional shapes. The first and second left deck beams 32L have beam members 33 that have a pair of vertical plates 33a opposing each other in a front and rear direction and that

are formed in cross-sectional concave shapes having openings at lower sides, and reinforcing plates 34 for coupling lower edge parts of the pair of vertical plates 33a. Front end parts of the beam members 33 (end parts at a left longitudinal plate 22L side)configure contacting parts 32c that are brought into contact with the external side surface 22a of the left longitudinal plate 22L so that the contacting parts 32c can be welded to the external side surface 22a. The beam members 33 couple the left side frame 31 L and the left longitudinal plate 22L. A third left deck beam 32L from the front is formed by erecting one plate material, and couples the left side frame 31 L and the left longitudinal plate 22L. That is, in the present embodiment, the left side frame 31L configures an "adjustment frame", and the left longitudinal plate 22L configures an "adjustment-side longitudinal plate".

[0022] As shown in Figs. 4 and 5, a part of a lower part of each of the pair of vertical plates 33a of the beam members 33 at a left longitudinal plate 22L side is cut off. Accordingly, a second opposing part 32a that is opposed to an upper surface 21a of the bottom plate 21 is formed by having a height-adjustment gap, at a lower part of the beam member 33. The second opposing part 32a has a shape extended in a direction parallel with a horizontal direction.

[0023] The reinforcing plates 34 are arranged to have a predetermined distance in a left and right direction from a front end part (the contacting part 32c) of the beam member 33. As shown in Figs. 4 and 5, a side surface of the reinforcing plate 34 is continuously extended downward from the second opposing part 32a of the beam member 33. The side surface of the reinforcing plate 34 configures a first opposing part 32b that is opposed to a side surface 21b of the bottom plate 21 to enable the first opposing part 32b to be welded to the side surface 21b when the contacting part 32c of the beam member 33 is brought into contact with the external side surface 22a of the left longitudinal plate 22L. The first opposing part 32b has a shape extended to a direction parallel with a vertical direction that is vertical to the second opposing part 32a.

[0024] When the contacting part 32c of the beam member 33 is brought into contact with the external side surface 22a of the left longitudinal plate 22L, the first opposing part 32b of the left deck beam 32L opposes the side surface 21b of the bottom plate 21. In this state, because a height-adjustment gap is formed in an up and down direction between the second opposing part 32a of the left deck beam 32L and the upper surface 21a of the bottom plate 21, the left side deck 30L can be adjusted to a proper height position by sliding the left side deck 30L in a height direction (an up and down direction) along a contact surface between the contacting part 32c of the left deck beam 32L and the external side surface 22a of the left longitudinal plate 22L and along an opposing surface between the side surface of the reinforcing plate 34 as the first opposing part 32b and the side surface 21b of the bottom plate 21.

[0025] In the example shown in Fig. 5, although the side surface of the reinforcing plate 34 as the first opposing part 32b and the side surface 21b of the bottom plate 21 are brought into contact with each other, a gap of a size (about 2 mm, for example)which permits welding may be provided between both side surfaces. By providing the gap, a size error of the left deck beam 32L can be absorbed. This gap is set to a size small enough to allow the gap to be buried by welding the first opposing part 32b to the side surface 21b of the bottom plate 21.

[0026] As shown in Fig. 6, after the left side deck 30L is adjusted to a proper height position, a contact portion between the contacting part 32c of the beam member 33 and the external side surface 22a of the left longitudinal plate 22L, and an opposing portion between the side surface (the first opposing part 32b) of the reinforcing plate 34 and the side surface 21b of the bottom plate 21 are welded respectively. As a result, the upper frame 15 is configured. At this time, height-position adjustment of the left side deck 30L becomes easy, by first welding the opposing surface between the first opposing part 32b and the side surface 21b of the bottom plate 21, and in this state by sliding the left side deck 30L in a height direction (an up and down direction) along the contact surface between the contacting part 32c and the external side surface 22a of the left longitudinal plate 22L. Therefore, it is preferable that the upper frame 15 is configured by first welding the opposing surface between the first opposing part 32b and the side surface 21b of the bottom plate 21, then by adjusting a height position of the left side deck 30L in this state, and last by welding the contact surface of the contacting part 32c to the external side surface 22a of the left longitudinal plate 22L.

[0027] In the above configuration, by adjusting a height position of the left side deck 30L using the first opposing part 32b as a pivot point, a height position of the left side deck 30L to the center section 20 becomes easy. Therefore, working efficiency improves. Further, a work of welding a height-adjustment member to a lower part of the left deck beam 32L and the like can be omitted. This omission contributes to improve working efficiency and also contributes to cost reduction by decreasing the number of parts.

[0028] Further, because a load applied to the left side deck 30L is dispersed to a welding portion between the contacting part 32c of the beam member 33 and the external side surface 22a of the left longitudinal plate 22L and to a welding portion between the side surface (the first opposing part 32b) of the reinforcing plate 34 and the side surface 21b of the bottom plate 21, rigidity of the upper frame 15 is secured.

Modification

[0029] The above embodiment may be also configured as follows.

[0030] In the above embodiment, an example of a configuration is described that the first left deck beam 32L

from the front and the second left deck beam 32L from the front respectively have the contacting part 32c, the first opposing part 32b, and the second opposing part 32a. That is, the end part of the beam member 33 at the left longitudinal plate 22L side configures the contacting part 32c, the lower end part of each of the pair of vertical plates 33a configures the second opposing part 32a, and the side surface of the reinforcing plate 34 coupled to the lower part of the beam member 33 configures the first opposing part 32b. However, shapes of the left deck beams 32L are not limited to the above example. For example, as shown in Fig. 7, the third left deck beam 32L from the front, that is, the left deck beam 32L formed by erecting one plate material, may be configured to have the contacting part 32c, the first opposing part 32b, and the second opposing part 32a. Specifically, by cutting off a lower part of a front end part (an end part at a left longitudinal plate 22L side) of the left deck beam 32L configured by a plate material, a remaining portion of the front end part of the left deck beam 32L may configure the contacting part 32c, and also this recessed portion may form the second opposing part 32a and the first opposing part 32b that is continuously extended downward from the second opposing part 32a.

[0031] The number of the left deck beam 32L may be one.

[0032] As described above, the present invention is extremely useful and has high industrial applicability because high practical utility is obtained that height adjustment of the side decks to the center section is facilitated and working efficiency can be improved in a simple configuration.

[0033] The above detailed embodiment mainly includes inventions having the following configurations.

[0034] The set of members forming an upper frame of a construction machine includes: a center section having a bottom plate, a left longitudinal plate erected at an inner side of a left edge part of the bottom plate, and a right longitudinal plate erected at an inner side of a right edge part of the bottom plate, the left longitudinal plate and the right longitudinal plate extended in a front and rear direction; a left side deck arranged at a left side of the center section; and a right side deck arranged at a right side of the center section. The left side deck has a left side frame extended in a front and rear direction, and a left deck beam for coupling the left side frame to the left longitudinal plate of the center section, and the right side deck has a right side frame extended in a front and rear direction, and a right deck beam for coupling the right side frame to the right longitudinal plate of the center section. At least one of the left deck beam or the right deck beam is an adjustment deck beam by which a height position relative to the center section can be adjusted. The adjustment deck beam has a contacting part that is adapted to be brought into contact with and is also adapted to be welded to an external side surface of an adjustment-side longitudinal plate opposing the adjustment deck beam out of the left longitudinal plate and the right longitudinal plate, a first opposing part that is adapted to be opposed to a side surface of the bottom plate and is also adapted to be welded to the side surface when the contacting part is brought into contact with the external side surface of the adjustment-side longitudinal plate, and a second opposing part that is adapted to be opposed to an upper surface of the bottom plate by having a height-adjustment gap in an up and down direction in a state where the contacting part is brought into contact with the external side surface of the adjustment-side longitudinal plate and also the first opposing part is opposed to the side surface of the bottom plate.

[0035] According to the set of members, height adjustment of the side deck to the center section is facilitated, and working efficiency can be improved in a simple configuration. Specifically, when the contacting part of the adjustment deck beam is brought into contact with the external side surface of the adjustment-side longitudinal plate and also when the first opposing part is opposed to the side surface of the bottom plate, because a height-adjustment gap is formed between the second opposing part and the upper surface of the bottom plate, the side deck can be adjusted to proper height positions by sliding the side deck to a height direction along the contact surface between the contacting part and the external side surface of the adjustment-side longitudinal plate and along the opposing surface between the first opposing part and the side surface of the bottom plate. Therefore, the work of welding the height-adjustment member to a lower part of the deck beam and the like as conventionally required can be omitted. Consequently, working efficiency improves, and cost reduction can be achieved by decreasing the number of parts.

[0036] After the side deck are adjusted to proper height positions, a contact portion between the contact part of the adjustment deck beam and the external side surfaces of the longitudinal plates, and a opposing portion between the first opposing part of the adjustment deck beam and the side surface of the bottom plate are welded respectively. As a result, the upper frame is configured. With this configuration, rigidity of the upper frame is secured because a load applied to each side deck is dispersed to a welding portion between the contacting part of the adjustment deck beam and the external side surface of the longitudinal plate and to a welding portion between the first opposing part of the adjustment deck beam and the side surface of the bottom plate.

[0037] Further, in the set of members, it is preferable that the adjustment deck beam has: a beam member that has downward opening shapes and that couple an adjustment frame opposed to the adjustment-side longitudinal plate, out of the left side frame and the right side frame, to the adjustment-side longitudinal plate, an end part of the beam member at an adjustment-side longitudinal plate side configuring the contacting part; and a reinforcing plate that partially blocks the openings of the beam member. The reinforcing plate is arranged at a predetermined distance in a left and right direction from

the contacting part such that when the contacting part of the beam member is brought into contact with the external side surface of the adjustment-side longitudinal plate, a portion of the reinforcing plate opposed to the side surface of bottom plate configures the first opposing part while a portion of the beam member opposed to an upper surface of the bottom plate configures the second opposing part.

[0038] With the above configuration, rigidity of the adjustment-side deck beam can be secured while maintaining easiness of adjusting a height position of the side deck to the center section. Specifically, by arranging the reinforcing plate for securing rigidity of the adjustment-side deck beam to have a predetermined distance in a left and right direction from the contacting part of the beam member, rigidity of the adjustment-side deck beam can be secured because the adjustment-side deck beam is configured by the beam member and the reinforcing plate. Further, the second opposing part is formed in the beam member, and the side surface of the reinforcing plate function as the first opposing part.

[0039] In the set of members, it is preferable that the first opposing part is opposed to the side surface of the bottom plate with a gap therebetween when the contacting part is brought into contact with the external side surface of the adjustment-side longitudinal plate, and the gap has a size small enough to allow the gap to be buried by welding between the first opposing part and the side surface of the bottom plate.

[0040] With the above configuration, a welding work can be performed by absorbing a size error of the adjustment-side deck beam. Specifically, when a distance from the contacting part of the adjustment-side deck beam to the first opposing part is shorter than a distance from the external side surface of the adjustment-side longitudinal plate to the side surface of the bottom plate due to a size error of the adjustment-side deck beam, the first opposing part is brought into contact with the side surface of the bottom plate before the adjustment deck beam is brought into contact with the external side surface of the adjustment-side longitudinal plate. This has a problem in that a gap occurs between the contacting part of the adjustment deck beam and the external side surface of the adjustment-side longitudinal plate.

[0041] On the other hand, according to the present invention, a size error of the adjustment deck beam is absorbed because a gap is provided between the first opposing part and the side surface of the bottom plate. Because this gap has a size (about 2 mm, for example)that permits welding, that is, a size small enough to allow the gap to be buried by welding the first opposing part to the side surface of the bottom plate, the welding work can be securely performed.

[0042] Further, the present invention includes a manufacturing method for manufacturing the upper frame of a construction machine. The manufacturing method includes: a preparing process for preparing the set of members; an adjusting process for adjusting a height position in an up and down direction of each adjustment deck beam to the center section in a state where the contacting part is brought into contact with the external side surface of the adjustment-side longitudinal plate and also the first opposing part is opposed to the side surface of the bottom plate; and a welding process for welding, after the adjusting process, a contact portion between the contacting part and the external side surface of the adjustment-side longitudinal plate and an opposing portion between the first opposing part and the side surface of the bottom plate, respectively.

[0043] According to the present manufacturing method, a height position of the side deck to the center section can be adjusted by only displacing the adjustment deck beam in an up and down direction in a state where the contacting part is brought into contact with the external side surface of the adjustment-side longitudinal plate and also the first opposing part is opposed to the side surface of the bottom plate. Further, the upper frame having sufficient rigidity can be easily configured by welding a contact portion between the contacting part and the external side surface of the adjustment-side longitudinal plate and an opposing portion between the first opposing part and the side surface of the bottom plate.

[0044] This application is based on Japanese Patent application No. 2012-259536 filed in Japan Patent Office on November 28, 2012, the contents of which are hereby incorporated by reference.

[0045] Although the present invention has been fully described by way of example with reference to the accompanying drawings, it is to be understood that various changes and modifications will be apparent to those skilled in the art. Therefore, unless otherwise such changes and modifications depart from the scope of the present invention hereinafter defined, they should be construed as being included therein.

[0046] A set of members forming an upper frame of a construction machine includes a center section, a left side deck, and a right side deck. The left side deck has a left deck beam. The right side deck has a right deck beam. At least one of the left deck beam or the right deck beam is adjustment deck beams. The adjustment deck beam has a contacting part that is adapted to be brought into contact with and is also adapted to be welded to an external side surface of an adjustment-side longitudinal plate, a first opposing part that is adapted to be opposed to a side surface of the bottom plate and is also adapted to be welded to the side surface, and a second opposing part that is adapted to be opposed to an upper surface of the bottom plate with a height-adjustment gap therebetween.

Claims

1. A set of members forming an upper frame of a construction machine, comprising:

a center section having a bottom plate, a left longitudinal plate erected at an inner side of a left edge part of the bottom plate, and a right longitudinal plate erected at an inner side of a right edge part of the bottom plate, the left longitudinal plate and the right longitudinal plate extended in a front and rear direction;
a left side deck arranged at a left side of the center section; and
a right side deck arranged at a right side of the center section, wherein
the left side deck has a left side frame extended in a front and rear direction, and a left deck beam for coupling the left side frame to the left longitudinal plate of the center section,
the right side deck has a right side frame extended in a front and rear direction, and a right deck beam for coupling the right side frame to the right longitudinal plate of the center section,
at least one of the left deck beam or the right deck beam is an adjustment deck beam by which a height position relative to the center section can be adjusted, and
the adjustment deck beam has a contacting part that is adapted to be brought into contact with and is also adapted to be welded to an external side surface of an adjustment-side longitudinal plate opposing the adjustment deck beam out of the left longitudinal plate and the right longitudinal plate, a first opposing part that is adapted to be opposed to a side surface of the bottom plate and is also adapted to be welded to the side surface when the contacting part is brought into contact with the external side surface of the adjustment-side longitudinal plate, and a second opposing part that is adapted to be opposed to an upper surface of the bottom plate by having a height-adjustment gap in an up and down direction in a state where the contacting part is brought into contact with the external side surface of the adjustment-side longitudinal plate and also the first opposing part is opposed to the side surface of the bottom plate.

2. The set of members according to claim 1, wherein the adjustment deck beam has: a beam member that has downward opening shapes and that couple an adjustment frame opposed to the adjustment-side longitudinal plate, out of the left side frame and the right side frame, to the adjustment-side longitudinal plate, an end part of the beam member at an adjustment-side longitudinal plate side configuring the contacting part; and a reinforcing plate that partially blocks the openings of the beam member, and
the reinforcing plate is arranged at a predetermined distance in a left and right direction from the contacting part such that when the contacting part of the beam member is brought into contact with the external side surface of the adjustment-side longitudinal plate, a portion of the reinforcing plate opposed to the side surface of bottom plate configures the first opposing part while a portion of the beam member opposed to an upper surface of the bottom plate configures the second opposing part.

3. The set of members according to claim 1, wherein the first opposing part is opposed to the side surface of the bottom plate with a gap therebetween when the contacting part is brought into contact with the external side surface of the adjustment-side longitudinal plate, and the gap has a size small enough to allow the gap to be buried by welding between the first opposing part and the side surface of the bottom plate.

4. The set of members according to claim 2, wherein the first opposing part is opposed to the side surface of the bottom plate with a gap therebetween when the contacting part is brought into contact with the external side surface of the adjustment-side longitudinal plate, and the gap has a size small enough to allow the gap to be buried by welding between the first opposing part and the side surface of the bottom plate.

FIG.1

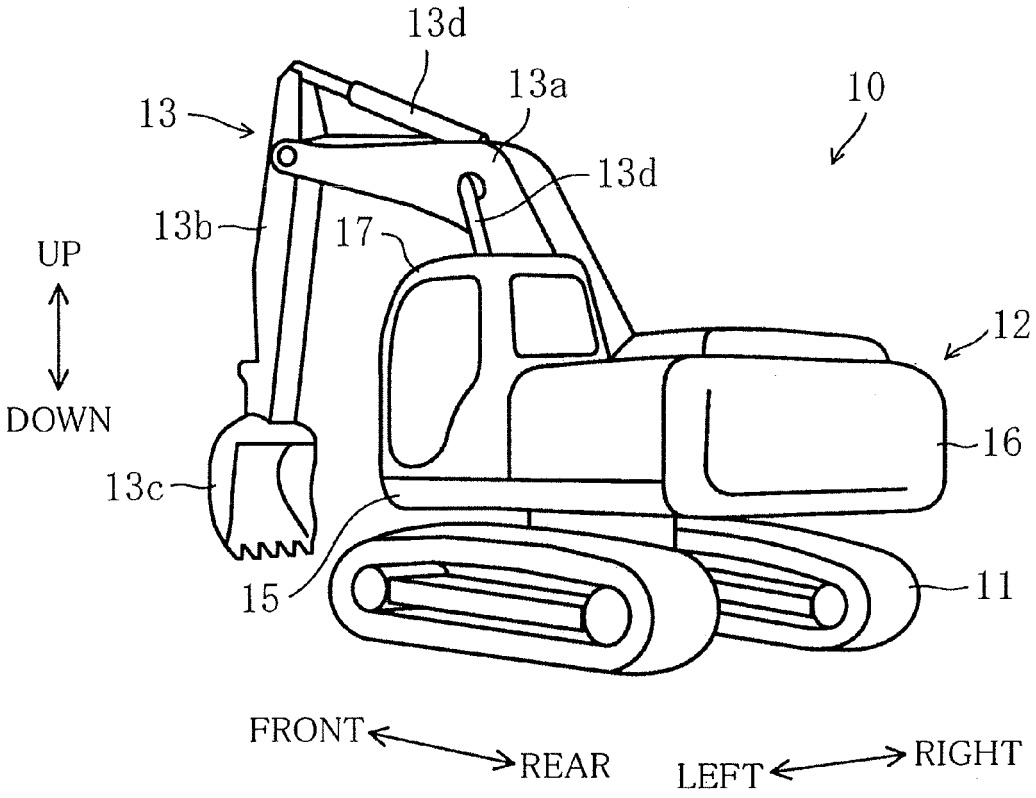

13d
13a
10
13
13d
13b
17
UP
DOWN
12
16
13c
15
11
FRONT
REAR
LEFT
RIGHT

FIG.2

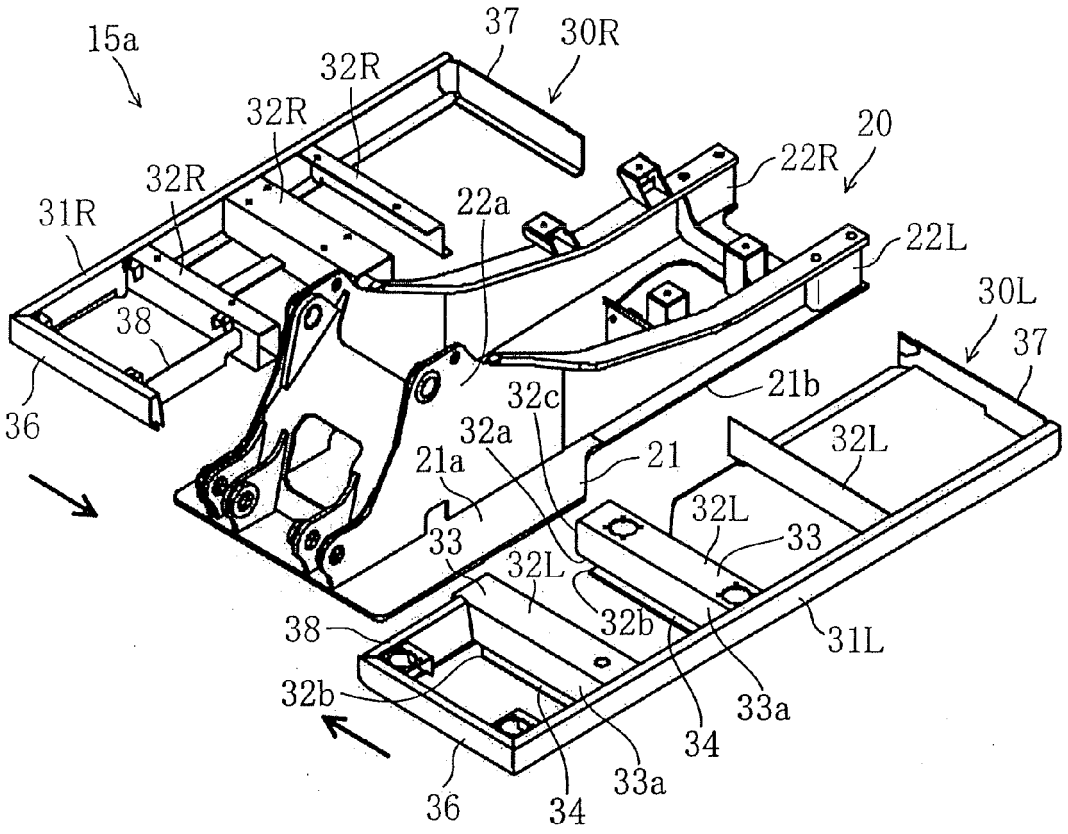

15a
37
30R
32R
32R
32R
20
22R
22a
31R
22L
30L
37
38
21b
32c
36
32a
21
32L
21a
32L
33
33
32L
32b
38
31L
32b
33a
34
33a
36
34

FIG.3

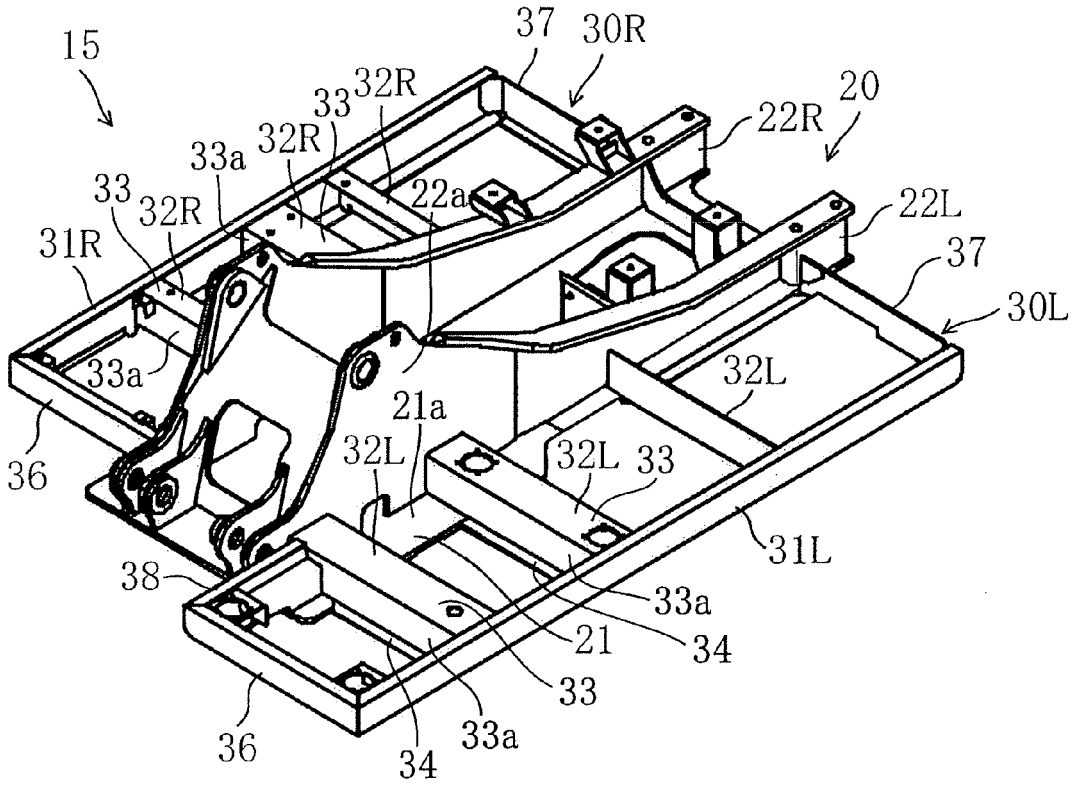

15
37
30R
20
22R
33
32R
33a
32R
22a
22L
33
32R
37
31R
30L
33a
32L
21a
36
32L
32L
33
31L
38
33a
21
34
33
36
34
33a

FIG.4

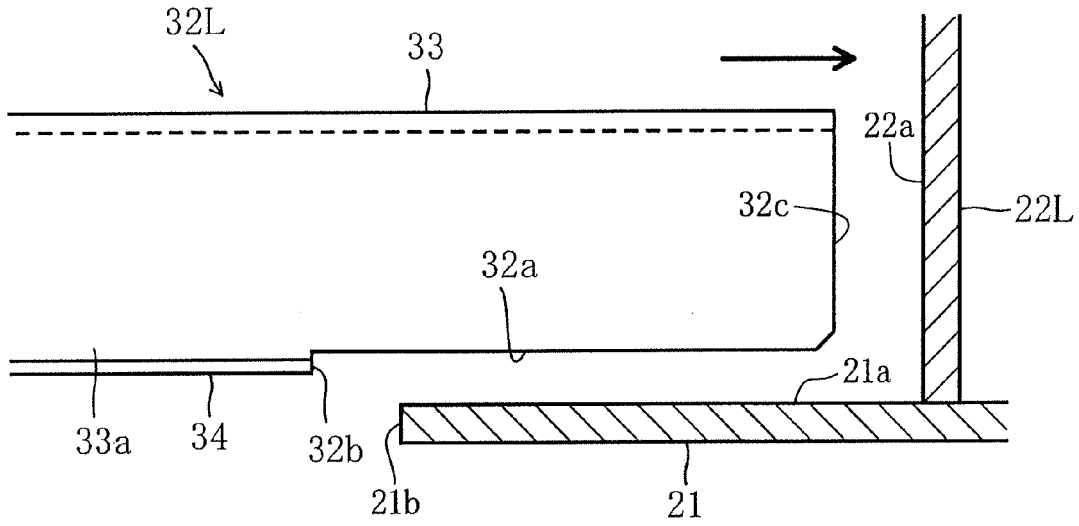

32L
33
22a
22L
32c
32a
21a
33a
34
32b
21b
21

FIG.5

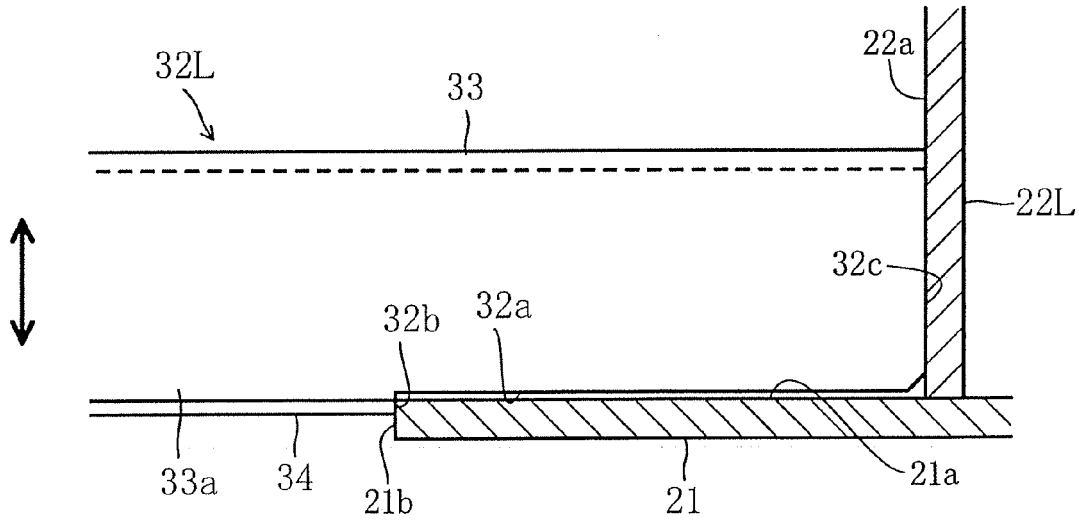

32L
33
22a
22L
32c
32b
32a
33a
34
21b
21
21a

FIG.6

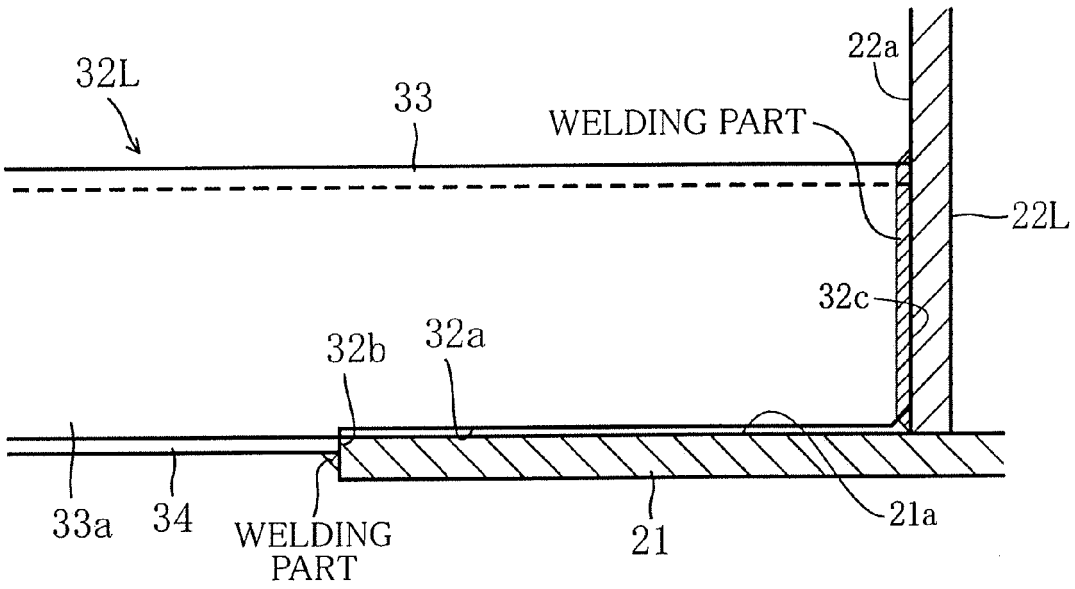
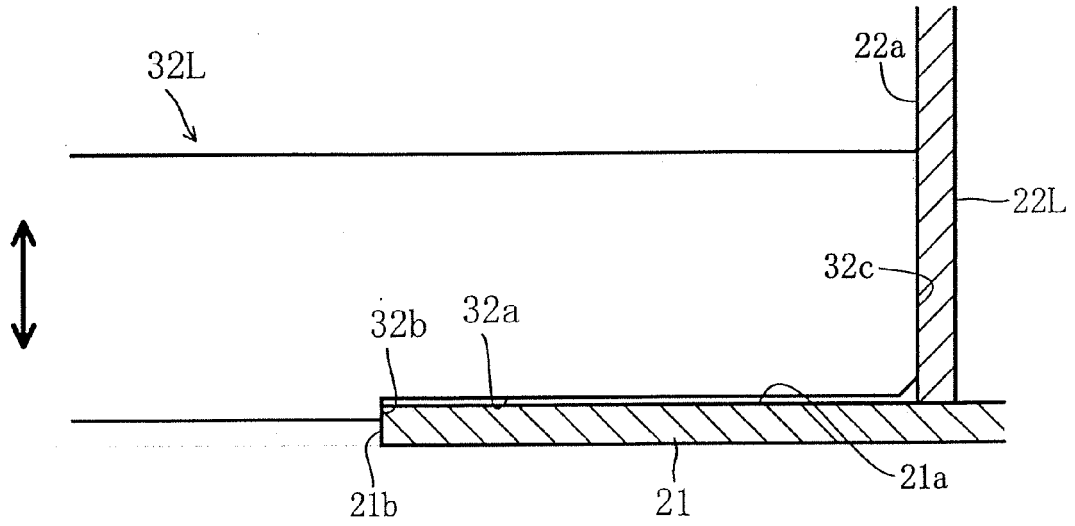

32L
33
22a
WELDING PART
22L
32c
32b
32a
33a
34
WELDING PART
21
21a

FIG.7


32L
22a
22L
32c
32b
32a
21b
21
21a

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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- JP 2012259536 A **[0044]**