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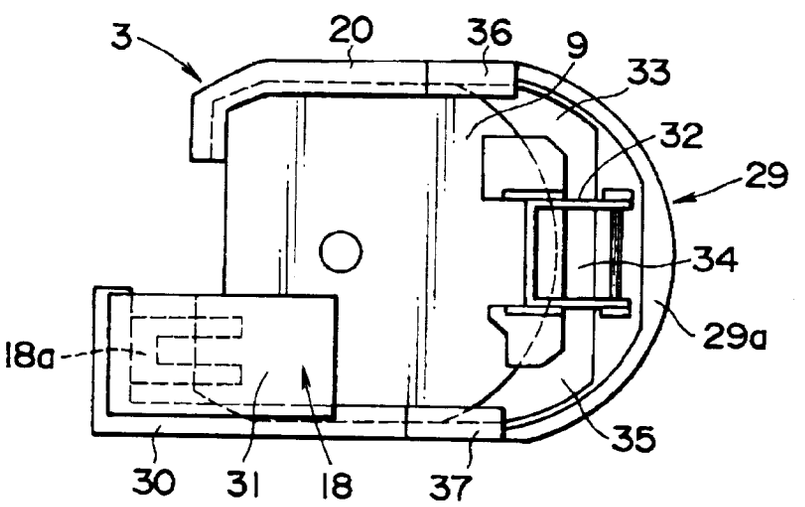
(54) Hydraulic working machine

(57) In a hydraulic working machine, such as an excavator, a swing frame 3 is provided free to swing on a travel body 2a. The swing frame 3 comprises a basic frame 9 and extending frames 31, 32 for extending the latter. The extending frames 31, 32 are mounted on the basic frame 9 to satisfy the various desired arrangements of components including a cab 28, an internal combustion engine and hydraulic apparatuses on the swing frame 3.

Accordingly, hydraulic working machines in which mounting positions for various apparatuses on the swing frame, or the uses of the hydraulic working machines, or sizes of cabs or positions of counterweights are different, may all be made with a basic portion of the swing frame in common, but extendable as necessary, to thereby reduce the cost.

FIG. 6b



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Description

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

The present invention relates to a hydraulic working machine such as a hydraulic excavator.

DESCRIPTION OF THE RELATED ART

The hydraulic working machine such as a hydraulic excavator is provided with a swing frame provided free to swing on a travel body. A cab for an operator is arranged in a part of the swing frame, and a counterweight is mounted at the rear of the swing frame. On the swing frame are mounted various apparatuses such as main apparatuses such as a hydraulic motor and an internal combustion engine as a drive source therefor, various hydraulic cylinders, a working oil tank, a fuel tank for storing fuel of the internal combustion engine, and the like.

Incidentally, various apparatuses mounted on the swing frame have a variety of shapes and sizes, and the swing frame also has various sizes depending on the mounting space.

For example, the aforementioned cab includes a plurality of shapes of cabs such as a small cab in which a space for an operator is relatively narrow, a relatively large cab which forms a wide space for an operator, and the like. Further, the aforementioned counterweight is provided on the peripheral edge at the rear of the swing frame, but the mounting position of the counterweight (the distance from a rotational shaft of the swing frame) is sometimes changed depending on the difference of uses and constitutions. In such a case, it is necessary to separately design and produce different shapes of swing frames depending on the size of a cab, or a mounting position of a counterweight, posing a disadvantage in that the cost is high.

Further, in the hydraulic working machine of this kind, in the case where the actual working spot is relatively narrow, there is provided a small swing frame in which a swing locus is substantially accommodated within a circle whose diameter is a clearance, whereas in the case where the actual working spot is relatively wide so that the large main apparatuses are required, a swing frame is also large. The swing frame provided on the hydraulic working machine is different in size adapted for the use. This also makes necessary to design and produce different shapes of a plurality of swing frames, posing a disadvantage in that the cost is high.

Furthermore, in the hydraulic excavator of this kind, there exists those having a plurality of body shapes even for the same class of machine (the main apparatuses such as an internal combustion engine, a tank, etc. are the same). That is, there exists one provided with a swing frame in which swing locus is substantially accommodated within a circle whose diameter is a clearance, and one in which a counterweight extends backward of the body leaving a relatively long distance from a rotary shaft of a swing frame in order to make a weight of a counterweight relatively small so as to reduce the weight of the body. Since these are different in the size of the cab and the position of the counterweight even for the same class of machine, it is necessary to produce swing frames peculiar thereto. Further, it is necessary to separately produce bonnets corresponding to different shapes of swing frames, thus posing a disadvantage in that the cost of producing various hydraulic excavators is high.

The present invention overcomes such disadvantages as noted above. It is an object of the present invention to provide a hydraulic working machine in which even if mounting spaces of various apparatuses on a swing frame or uses of the hydraulic working machines are different, and even if the size of cabs or position of counterweights are different in the same class of machine, basic parts of the swing frame are made common to thereby reduce the cost.

SUMMARY OF THE INVENTION

For achieving the aforesaid object, according to the present invention, there is provided a hydraulic working machine comprising a travel body and a swing frame provided free to swing on the travel body, the swing frame comprising a basic frame and an extending frame for extending the basic frame, whereby the extending frame is mounted on the basic frame as necessary corresponding to the arrangement on the swing frame of a cab, an internal combustion engine, various apparatuses including a hydraulic apparatus and a counterweight.

According to the present invention, in the case where a cab, an internal combustion engine, various apparatuses including a hydraulic apparatus and a counterweight are accommodated on the swing frame within the basic frame, only the basic frame constitutes the swing frame. When any one on the swing frame out of a cab, an internal combustion engine, various apparatuses including a hydraulic apparatus and a counterweight is not accommodated within the basic frame, an extending frame is mounted on the basic frame to constitute a swing frame having a wide mounting space. The extending frame is mounted on the basic frame as necessary as described above whereby the basic frame is made common to form a necessary mounting space, thus reducing the production cost.

In the present invention, the basic frame has a minimal size enough to accommodate the cab, the internal combustion engine and various apparatuses including the hydraulic apparatus to form a shape that can be swung substantially within a clearance of the travel body. The basic frame sometimes has a portion projecting somewhat outwardly of the clearance of the travel body while being affected by the arrangement of main

apparatuses such as the internal combustion engine and various tanks to be mounted. Even in this case, it will suffice to be formed so as to be substantially swung within the clearance of the travel body.

According to a further feature of the present invention, plural kinds of said extending frames are formed in different shapes corresponding to a mounting position of the basic frame.

With this, the extending frame is mounted on the basic frame at a location merely required according to the shape of the various apparatuses whereby the swing frame can be formed into a desired shape without newly performing the design and production, thus preventing the increase of cost.

In the case where the basic frame is provided with a cab mounting portion capable of selectively mounting a plurality of cabs different in shape, the extending frame is mounted on the basic frame depending on the bottom shapes of various cabs.

More specifically, the extending frame is mounted on the basic frame according to various cabs to thereby enable the selective mounting of a cab for a small swing having a shape capable of being swung substantially within a clearance of the travel body, and a normal type cab having a shape outwardly of a clearance of the travel body at least during the swinging. Particularly, in the case where the normal type cab is mounted on the basic frame, the extending frame is extended from the basic frame, and at least a part of the normal type cab is mounted on the extending frame. That is, in the case where the cab mounted on the extending frame is protruded outwardly from the cab mounting portion, the extending frame is mounted on the cab mounting portion to support the bottom of the cab.

As described above, it is possible to correspond to plural kinds of cab different in shape by mounting and removal of the extending frame from the cab mounting portion, and in the case where either cab for a small swing or normal type cab is mounted, it will suffice that the extending frame is merely provided, whereby the basic frame can be made to be a common shape, thus reducing an increase of production cost.

Further, in the case where the basic frame is provided with a counterweight mounting portion at the rear thereof, when the counterweight is mounted backward of the counterweight mounting portion, the extending frame is mounted on the basic frame according to the mounting position of the counterweight. That is, in the case where the counterweight is mounted on the counterweight mounting portion of the basic frame, the swing frame is constituted without provision of the extending frame. In the case where the counterweight is mounted at a position rearwardly of the counterweight mounting portion of the basic frame, the counterweight can be mounted at a position rearwardly of the counterweight mounting portion of the basic frame through the extending frame.

Further, when the basic frame has a shape capable of being swung within a clearance and in the case where the counterweight for a small swing having a shape capable of being swung within a clearance of the travel body is mounted, the counterweight for a small swing is mounted on the basic frame without provision of the extending frame. In the case where an extending type counterweight extended outwardly of a swing locus of the basic frame at least during the swinging is mounted, the extending frame is provided on the basic frame to form the extending type counterweight. More specifically, the extending type counterweight is constituted by an extending frame comprising a weight supporting member mounted on the basic frame and a weight member mounted on the extending frame. The weight supporting member which is the part of the extending frame is provided on the basic frame and the weight member is provided on the weight supporting member. An under cover is provided on the basic frame when the extending type counterweight is mounted to thereby cover a gap between the basic frame and the weight member. Further, in the extending type counterweight, the extending frame comprising the frame extending member mounted on the basic frame and the weight member are constituted integrally whereby the extending type counterweight can be provided in the state where the gap between the basic frame and the weight member is covered without an under cover. Further, the weight of the extending type counterweight is made smaller than that of the counterweight for a small swing to thereby make the shape of the swing frame common to reduce the weight of the body.

By the provision of the aforementioned constitution, in the case where the rear end of the swing frame is made capable of being swung within a clearance, the counterweight for a small swing may be mounted without mounting the extending frame on the basic frame. In the case where the rear end of the swing frame is not made capable of being swung within a clearance but the counterweight is provided further rearwardly, the extending frame is merely provided. Thereby, the basic frame can be made to have a common shape, thus reducing an increase of production cost.

Further, in the present invention, in the case where the end shape of the counterweight for a small swing is of a substantially circular shape around a swinging axis of the basic frame on which the counterweight for a small swing is mounted, preferably, the end shape of the extending type counterweight is of a substantially circular shape having substantially the same radius as the counterweight for a small swing. More preferably, the rear end of the extending type counterweight is made to have the same shape as the rear end of the counterweight for a small swing. Thereby, in the case where either the counterweight for a small swing or the extending type counterweight is mounted, the rear end shape of the counterweight for a small swing can be made common.

When the counterweight for a small swing is provided at the rear end of the basic frame, a rear bonnet for

covering the rear portion of the basic frame and a bonnet for covering the front portion of the basic frame are provided. When the extending type counterweight provided with an extending frame is provided at the rear of the basic frame, the extending frame is covered by the rear bonnet, and an intermediate bonnet for covering the rear portion of the basic frame is provided between the rear bonnet and the front bonnet.

With this, even in the case where the extending type counterweight is provided in place of the counterweight for a small swing, the gap between the rear bonnet and the front bonnet can be covered by the intermediate bonnet. Further, since the shape of the rear bonnet can be made common, the increase of production cost can be reduced.

Further, in the present invention, preferably, a deck cover corresponding to the counterweight for a small swing and an extending deck cover corresponding to the extending type counterweight are selectively mounted on the basic frame. Thereby, the gap formed when the extending type counterweight is mounted on the basic frame can be filled by the extending deck cover.

Further, in the present invention, there is provided a hydraulic working machine comprising a travel body and a swing frame provided free to swing on the travel body, the swing frame comprising a basic frame and an extending frame for extending the basic frame, whereby the extending frame being mounted on the basic frame as necessary corresponding to the constitution required according to the uses of the hydraulic working machine.

For example, in the case of the hydraulic working machine used at a relatively narrow actual working spot, a layout is made so that the aforementioned main apparatuses are accommodated on the basic frame without mounting the extending frame on the basic frame. Further, in the case where the actual working spot is relatively wide and the main apparatuses of a large type are required, the extending frame is mounted on the basic frame to form a space capable of mounting the large main apparatuses. As described, even if the size of the swing frame changes according to the use, the basic frame can be used common, thus reducing the cost.

Also in this case, as described previously, the plural kinds of the extending frames are formed different in shape corresponding to the mounting position of the basic frame, and the extending frames are separately selectively mounted on the basic frame whereby the extending frames can be mounted at locations as necessary for the uses and the swing frame can be formed into the desired shape without newly performing design and production, thus reducing the cost.

Further, in the present invention, there is provided a hydraulic working machine comprising a travel body; a swing frame provided free to swing on the travel body, the sing frame comprising a basic frame formed into a shape capable of being swung substantially within a clearance of the travel body, and an extending frame for extending the basic frame; a boom journalled vertically rotatably on the swing frame, the boom being journalled rearwardly of a front end edge of the basic frame; a normal type cab having a shape extended outwardly of the clearance of the travel body at least during the swinging, the normal cab being mounted on one side in a lateral direction of the boom in the basic frame and partly mounted on the extending frame; and a counterweight for a small swing having a shape capable of being swung substantially within a clearance of the travel body, the counterweight for a small swing being mounted at the rear of the basic frame.

According to the present invention, for example, even relatively narrow actual working spot, in the case where a relatively wide space for an operator is desired to be secured, the extending frame is provided frontwardly of the basic frame to mount the normal type cab thereon, whereas the counterweight for a small swing is mounted at the rear of the basic frame so that only the rear portion can be swung within a clearance. Thereby, the operator can work pleasantly in the wide space for an operator without worrying about the rear portion in the actual working spot. Moreover, since the boom is journalled at the position at the rear of the front end edge of the basic frame whereby even if the counterweight for a small swing capable of being swung within a clearance is provided, the stability of the body can be enhanced by the balance relative to the boom. Moreover, also in the case where the normal type cab having a shape extended outwardly of the clearance is mounted on the basic frame formed into a shape capable of being swung within the clearance, a layout for an internal combustion engine and various apparatuses including hydraulic apparatuses need not particularly changed on the basic frame, thus making the basic frame common to prevent the production cost from being increased.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side view showing a hydraulic working machine according to an embodiment of the present invention;

FIG. 2 is a plan view schematically showing a basic frame according to the present embodiment;

FIG. 3 (a) is a plan view schematically showing, with a part exploded, a first constitutional example according to the basic frame shown in FIG. 2, FIG. 3 (b) being a plan view after assembled;

FIG. 4 is an explanatory plan view of the hydraulic working machine shown in FIG. 1;

FIG. 5 is a side view of a further hydraulic working machine;

FIG. 6 (a) is a plan view schematically showing, with a part exploded, a second constitutional example according to the basic frame shown in FIG. 2, FIG. 6 (b) being a plan view after assembled;

FIG. 7 is an explanatory plan view of the hydraulic working machine shown in FIG. 5;

FIG. 8 (a) is a plan view schematically showing, with

a part exploded, a third constitutional example according to the basic frame shown in FIG. 2, FIG. 8 (b) being a plan view after assembled; FIG. 9 is a side view showing a hydraulic working machine according to a further embodiment;

FIG. 10 (a) is a plan view schematically showing, with a part exploded, a fourth constitutional example according to the basic frame shown in FIG. 2, FIG. 10 (b) being a plan view after assembled;

FIG. 11 is an explanatory plan view of the hydraulic working machine shown in FIG. 9; and

FIG. 12 is an explanatory plan view of the hydraulic working machine according to another embodiment.

DESCRIPTION OF PREFERRED EMBODIMENTS

Embodiments of the present invention will be described hereinafter with reference to the accompanying drawings; in which FIG. 1 is a side view showing a hydraulic working machine according to an embodiment of the present invention; FIG. 2 is a plan view schematically showing a basic frame according to the present embodiment; FIG. 3 (a) is a plan view schematically showing, with a part exploded, a first constitutional example according to the basic frame shown in FIG. 2, FIG. 3 (b) being a plan view after assembled; FIG. 4 is an explanatory plan view of the hydraulic working machine shown in FIG. 1; FIG. 5 is a side view of a further hydraulic working machine; FIG. 6 (a) is a plan view schematically showing, with a part exploded, a second constitutional example according to the basic frame shown in FIG. 2, FIG. 6 (b) being a plan view after assembled; FIG. 7 is an explanatory plan view of the hydraulic working machine shown in FIG. 5; FIG. 8 (a) is a plan view schematically showing, with a part exploded, a third constitutional example according to the basic frame shown in FIG. 2, FIG. 8 (b) being a plan view after assembled; FIG. 9 is a side view showing a hydraulic working machine according to a further embodiment; FIG. 10 (a) is a plan view schematically showing, with a part exploded, a fourth constitutional example according to the basic frame shown in FIG. 2, FIG. 10 (b) being a plan view after assembled; FIG. 11 is an explanatory plan view of the hydraulic working machine shown in FIG. 9; and FIG. 12 is an explanatory plan view of the hydraulic working machine according to another embodiment.

As shown in FIG. 1, a hydraulic working machine 1 according to the present embodiment is a small hydraulic excavator constructed for working in a narrow spot, which comprises a travel body 2a, and a swing body 2b provided free to swing on the travel body 2a. The swing body 2b is constituted with a swing frame 3 constituting a floor portion as a base, and a boom 4, an arm 5 and a bucket 6 are extended frontwardly from the swing frame 3. The swing frame 3 is provided with a cab 7 forming a space for an operator and a counterweight 8.

The swing frame 3 is formed by a basic frame 9 as shown in FIG. 3 (b). The basic frame 9 has a shape which is substantially accommodated within a circle whose diameter is a clearance formed by a lateral width of the travel body 2a as viewed in plan as shown in FIG. 2, which is formed so that a portion protruding from the clearance of the travel body 2a is as small as possible even during the swinging. Particularly, the shape of the rear end edge of the basic frame 3 is formed to be a circular shape along the swing locus. On the basic frame 9 are mounted various apparatuses such as a battery 10, a working oil tank 11, an operating valve 12, a swing motor 13, a pump 14, an engine 16, a radiator 16, a fuel tank 17 and so on, comprising a cab mounting portion 18 for mounting the cab 7. A bracket 9 for a boom for journalling a base of the boom 4 is provided at the rear of the front end edge of the basic frame 9.

As shown in FIG. 3 (a), the basic frame 9 has deck covers 20 and 21 mounted along the left and right side edges, a floor plate 22 is mounted on the cab mounting portion 18, and a counter weight 8 is secured to the rear end edge thereof to constitute the swing frame 3, as shown in FIG. 3 (b).

The relatively small cab 7 for a small swing substantially accommodated within a circle whose diameter is a clearance is mounted on the floor plate 22 of the cab mounting portion 18, as shown in FIG. 3(b). Further, since the aforementioned various apparatuses are mounted on the basic frame 9, as shown in FIG. 2, a first bonnet 23 and a second bonnet 24 for receiving them are provided as shown in FIG. 4. The first bonnet 23 covers the battery 10, the working oil tank 11, the operating valve 12 and the like mounted on the basic frame 9 on the opposite side of the cab 7, and the second bonnet 24 covers the pump 14, the engine 16, the radiator 16 and the like mounted on the rear side of the basic frame 9. The second bonnet 24 is of a generally semicircular shape as viewed in plan, as shown in FIG. 4, rear end of which is formed into a shape corresponding to a circular shape of the counterweight 8. Further, the swing motor 13 and the fuel tank 17, etc. are covered by guard members 25 and 26, respectively. In this way, the hydraulic working machine 1 capable of being swung according to uses in which the work is performed in a narrow spot as shown in FIG. 1.

Next, a hydraulic working machine 27 shown in FIG. 5 will be described. The hydraulic working machine 27 has a cab 28 whose shape is larger than that of the hydraulic working machine 1 shown in FIG. 1 in order to widen the space for an operator. While a counterweight 29 of the hydraulic working machine 27 has the same shape as that mounted on the hydraulic working machine 1 shown in FIG. 1, it is mounted to be positioned at the rear of the hydraulic working machine shown in FIG. 1. A counterweight 29 which is lighter than the counterweight 8 mounted on the hydraulic working machine 1 shown in FIG. 1 is used.

The hydraulic working machine 27 shown in FIG. 5

is formed by using the basic frame 9 shown in FIG. 2 similar to the hydraulic working machine shown in FIG. 1. That is, the basic frame 9 is provided with the deck covers 20 and 30 along the left and right side edges as shown in FIGS. 6 (a) and (b), and an extending floor plate 31 in the form of an extending frame for extending the basic frame 9 is mounted on the cab mounting portion 18. Further, the extending floor plate 13 is connected to the cab mounting portion 18 by a cab supporting frame 18a for supporting an extended portion thereof from the bottom thereof. A bracket 32 in another form of the extending frame is provided at the rear of the basic frame 9, and a counterweight 29 is secured through the bracket 32. Under guards 33, 34, and 35 are provided under the bracket 32. The bracket 32 is extended rearwardly of the basic frame 29 to thereby form a gap between the deck covers 20 and 30 and the opposite ends of the counterweight 29. Extending deck covers 36 and 37 for extending the deck covers 20 and 30 rearwardly are provided to fill the gap.

Further, as shown in FIG. 7, the same bonnets as the first bonnet 23 and the second bonnet 24 are provided on the basic frame 9. Particularly, the second bonnet 24 can be used in common, since the counterweight 29 provided at the rear of the basic frame 9 is the same shape as the counterweight 8 shown in FIG. 4. Here, the second bonnet 24 is provided to be positioned at the rear of the basic frame 9 whereby a third bonnet 38 is provided in the gap formed between the first bonnet 23 and the second bonnet 24 to fill the gap.

In the cab mounting portion 18 enlarged by the extending floor plate 31 as shown in FIG. 6 (b) can be formed the hydraulic working machine 27 shown in FIG. 5 with a cab 28 having a relatively wide space for an operator mounted as shown in FIG. 7.

In this way, as will be apparent from the comparison between the hydraulic working machine 1 and the hydraulic working machine 27 previously mentioned, since the first bonnet 23, the second bonnet 24 including the basic frame 9 as a main part can be used in common, the production cost can be reduced.

Further, in the hydraulic working machine 27 shown in FIG. 5, a counterweight 40 integrally provided with an extending floor portion 39 may be provided at the rear of the basic frame 9 as shown in FIGS. 8 (a) and (b) as another form of the extending frame according to the present invention. In FIGS. 8 (a) and (b), parts used in common to those of FIGS. 6 (a) and (b) are designated by the same reference numerals. Since the counterweight 40 is provided with the extending floor portion 39, the extending floor portion 39 is connected to the rear end of the basic frame 9 whereby the basic frame 9 can be extended easily to provide the counterweight 40. It is noted that the counterweight 40 has an outer circumference of the rear end thereof formed to have a similar shape to that of the counterweight 28 shown in FIG. 6 (a), and can be provided without changing the shape of the second bonnet 24. With this, its external appearance can be formed similarly to the hydraulic working machine 27 shown in FIG. 7.

Next, a hydraulic working machine 41 shown in FIG. 9 will be described. The hydraulic working machine 41 has a cab 28 having a larger shape than that of the hydraulic working machine 1 shown in FIG. 1 in order to widen a space for an operator. This cab is the same as that provided on the hydraulic working machine 27 shown in FIG. 5. Further, the counterweight 8 of the hydraulic working machine 41 is the same as that mounted on the hydraulic working machine 1 shown in FIG. 1.

The hydraulic working machine 41 shown in FIG. 9 is formed by using the basic frame 9 shown in FIG. 2 similar to the hydraulic working machine 1 shown in FIG. 1. That is, the basic frame 9 is provided with the deck covers 20 and 30 along the left and right side edges, as shown in FIGS. 10 (a) and (b), and the extending floor plate 31 in one form of the extending frame for extending the basic frame 9 is provided on the cab mounted portion 18.

Further, as shown in FIG. 11, the same bonnets as the first bonnet 23 and the second bonnet 24 shown in FIG. 4 are provided on the basic frame 9.

In this way, as will be apparent from the comparison between the hydraulic working machine 1 and the hydraulic working machine 41 as previously mentioned, it is possible to form the machine easily which can be swung within a clearance at the rear portion and can mount the cab 28 having a wide space for an operator. Recently, in the narrow actual working spot as in cities or the like, a small hydraulic excavator that can be swung substantially within a clearance, as in the aforementioned hydraulic working machine 1, is generally employed. On the other hand, since the work is performed forward even the narrow actual working spot, the forward, that is, portions where the boom 4 and the cab 28 are provided sometimes not always need be swung within a clearance. In this case, the cab 28 having a wide space for an operator is mounted to secure a pleasant property for an operator so that the rear side thereof is used for the counterweight 8 for a small swing to allow an operator to perform his work without worrying about the rear portion.

Further, since the bracket 19 for a boom for journalling the base of the boom 4 is provided at the rear of the front end edge of the basic frame 9 similar to the aforementioned hydraulic working machine 1, it is possible to employ the constitution in which the pivotal position of the boom 4 is made close to the swing axis of the basic frame 9 to thereby enable the enhancement of stability.

Moreover, also in the hydraulic working machine 41, the basic frame 9 shown in FIG. 2 is used in common, and the extending floor plate 31 in one form of the extending frame and the cab supporting frame 18a supporting the extending floor plate 31 from the bottom are provided on the cab mounting portion 18 to extend the cab mounting portion 18 easily, thus enabling the reduction in production cost resulting from the change of spec-

ification.

Further, as shown in FIG. 12 as another embodiment, the basic frame 9 shown in FIG. 2 is used as a base, and only the position of the counterweight 8 can be easily changed in the hydraulic working machine shown in FIG. 4. That is, on the basic frame 9 shown in FIG. 2 are provided the bracket 32 as the extending frame shown in FIG. 6 (a) and the counterweight 29 or the counterweight 40 provided integral with the extending floor portion 39 shown in FIG. 8 (a), and the extending deck covers 36, 37 and the third bonnet cover 38 are merely provided to thereby form the hydraulic working machine 42 having the shape as shown in FIG. 12.

As described above, since all of the aforementioned hydraulic working machines 27, 41 and 42 can use in common the basic frame 9 used for the swing frame 3 of the hydraulic working machine 1 according to the arrangement of cab 7, 28, the various apparatuses and the counterweights 8, 29 and uses of specification, they can be constituted merely by extending various extending frames such as the extending floor plate 31 and the bracket 32 in the basic frame 9. The basic frame 9 is used in common to thereby reduce the production cost of the hydraulic working machines 1, 27, 41 and 42.

While in the above-described embodiments, an example has been illustrated in which the basic frame 9 can be extended without changing the mounting position of various apparatuses on the basic frame 9, it is to be noted that in the case where the basic frame 9 is extended, the mounting space for various apparatuses can be secured relatively widely on the swing frame 3, and the mounting position of various apparatuses can be also changed according to the shape of the swing frame 3. Thereby, various apparatuses can be arranged with good balance according to the shape of the extended swing frame 3. As compared with the case where the swing frame 3 is constituted merely by the basic frame 9, the space for mounting various apparatuses is large in the case where the basic frame 9 is extended by various extending frames. Therefore, the arrangements of various apparatuses mounted on the swing frame 3 include not only the arrangement suitable for the case of only the basic frame 9 but also the arrangement for suitable when the basic frame 3 is extended by the aforementioned extending frames. Thus, a plurality of arrangements of various apparatuses suitable for the case of only the basic frame and the case where the basic frame 9 is extended by the extending frames are determined whereby the arrangements of various apparatuses on the basic frame 9 can be selectively employed according to the shape of the swing frame 3, that is, according to whether or not the extending frames are provided on the basic frame.

Further, while in the present embodiments, descriptions have been made of, when the plurality of cabs different in shape are selectively mounted, the extension of the basic frame 9 and the extension of the basic frame 9 resulting from the change of the mounting position of the counterweight, it is to be noted that according to the present invention, though not shown, for example, other extending frames can be provided to support the internal combustion engine and hydraulic apparatuses protruded from the basic frame 9 in order to extend the mounting space for the internal combustion engine and hydraulic apparatus on the swing frame 3. The extending frames provided to extend the basic frame 9 are not limited to those shown in the present embodiments but needless to say, various shapes of extending frames can be selectively mounted according to the mounting position onto the basic frame 9.

As will be apparent from the above-described explanation, in the case where the hydraulic working machine is used in the relatively narrow actual working spot, the various shapes of extending frame are not mounted on the basic frame 9, and in the case where the actual working spot is relatively wide so that the large main apparatuses are required, the bracket 32 and the extending frames such as the extending floor portion 39 are mounted on the basic frame 9 to form a space capable of mounting large main apparatuses on the swing frame 3, thus reducing the production cost using the basic frame 9 in common even if the size of the swing frame 3 adapted to uses is different.

Claims

1. A hydraulic working machine comprising;

   a travel body; and
   a swing frame provided free to swing on said travel body, said swing frame comprising a basic frame and an extending frame for extending said basic frame, whereby said extending frame is mounted on said basic frame as necessary according to an arrangement on said swing frame of a cab, an internal combustion engine, various apparatuses including a hydraulic apparatus and a counterweight.

2. The hydraulic working machine according to claim 1, wherein said basic frame is formed to have a shape capable of being swung within a clearance of said travel body.

3. The hydraulic working machine according to claim 1, wherein a plurality of said extending frames different in shape are formed according to a mounting position relative to said basic frame, each extending frame being selectively mounted on the basic frame.

4. The hydraulic working machine according to claim 1, wherein said basic frame comprises a cab mounting portion capable of selectively mounting a plurality of cabs different in shape, and said extending

frames are mounted on said basic frame according to the bottom shape of the cabs.

5. The hydraulic working machine according to claim 2, wherein said cab comprises a cab for a small swing having a shape capable of being swung within a clearance of said travel body, or a normal type cab having a shape protruding outwardly of the clearance of said travel body at least during the swinging, said cab for a small swing and said normal type cab being selectively mounted on said basic frame.

6. The hydraulic working machine according to claim 5, wherein said extending frame is extended on said basic frame, and at least a part of said normal type cab is mounted on said extending frame.

7. The hydraulic working machine according to claim 1, wherein said basic frame comprises a counterweight mounting portion at the rear thereof, and said extending frame is mounted on said basic frame according to a mounting position of the counterweight when the counterweight is mounted at the rear of the counterweight mounting portion of said basic frame.

8. The hydraulic working machine according to claim 2, wherein said counterweight comprises a counterweight for a small swing formed so as to be substantially accommodated within a swing locus of said basic frame or an extending type counterweight formed so as to extend outwardly of the swing locus of said basic frame at least during the swinging, said counterweight for a small swing and said extending type counterweight being selectively mounted.

9. The hydraulic working machine according to claim 8, wherein said extending type counterweight comprises an extending frame comprising a weight supporting member mounted on said basic frame and a weight member mounted on said extending frame.

10. The hydraulic working machine according to claim 9, wherein an undercover for covering a gap between the basic frame and said weight member is provided when said extending type counterweight is mounted on said basic frame.

11. The hydraulic working machine according to claim 8, wherein said extending type counterweight comprises an integral constitution of an extending frame comprising a frame extending member mounted on said basic frame and a weight member.

12. The hydraulic working machine according to claim 8, wherein the weight of said extending type counterweight is smaller than that of said counterweight for a small swing.

13. The hydraulic working machine according to claim 8, wherein a shape of the rear end of said counterweight for a small swing is substantially circular about a swing axis of said basic frame on which said counterweight for a small swing is mounted, and a shape of the rear end of said extending type counterweight is substantially circular of the radius which is substantially the same as said counterweight for a small swing.

14. The hydraulic working machine according to claim 13, wherein the rear end of said extending type counterweight has the same shape as that of the rear end of said counterweight for a small swing.

15. The hydraulic working machine according to claim 13, wherein when said counterweight for a small swing is provided on the rear end of said basic frame, a rear bonnet for covering the rear portion of said basic frame and a front bonnet for covering the front portion of said basic frame are provided, and when said extending type counterweight provided with said extending frame is provided at the rear of said basic frame, said extending frame is covered by said rear bonnet, and an intermediate bonnet for covering the rear portion of said basic frame is provided between said rear bonnet and said front bonnet.

16. The hydraulic working machine according to claim 8, wherein a deck cover corresponding to said counterweight for a small swing and an extending deck cover corresponding to said extending type counterweight can be selectively mounted on said basic frame.

17. A hydraulic working machine comprising:

a travel body; and

a swing frame provided free to swing on said travel body, said swing frame comprising a basic frame and an extending frame for extending said basic frame, whereby said extending frame is mounted on the basic frame as necessary according to the constitution required according to use of the hydraulic working machine.

18. The hydraulic working machine according to claim 17, wherein a plurality of said extending frames different in shape are formed according to a mounting position relative to said basic frame, said extending frames being selectively mounted on said basic frame.

19. A hydraulic working machine comprising:

a travel body;
a swing frame provided free to swing on said travel body, said swing frame comprising a basic frame formed to have a shape capable of being swung within a clearance of said travel body and an extending frame for extending said basic frame;
a boom journalled rotatably in a vertical direction on said swing frame, said boom being journalled at the rear of the front end edge of said basic frame;
a normal type cab having a shape protruded outwardly of a clearance of said travel body at least during the swinging, said normal type cab being mounted on one side in a lateral direction of said boom in the basic frame and partly mounted on said basic frame; and
a counterweight for a small swing having a shape capable of being swung substantially within a clearance of said travel body, said counterweight for a small swing being mounted on the rear side of said basic frame.

FIG. 1

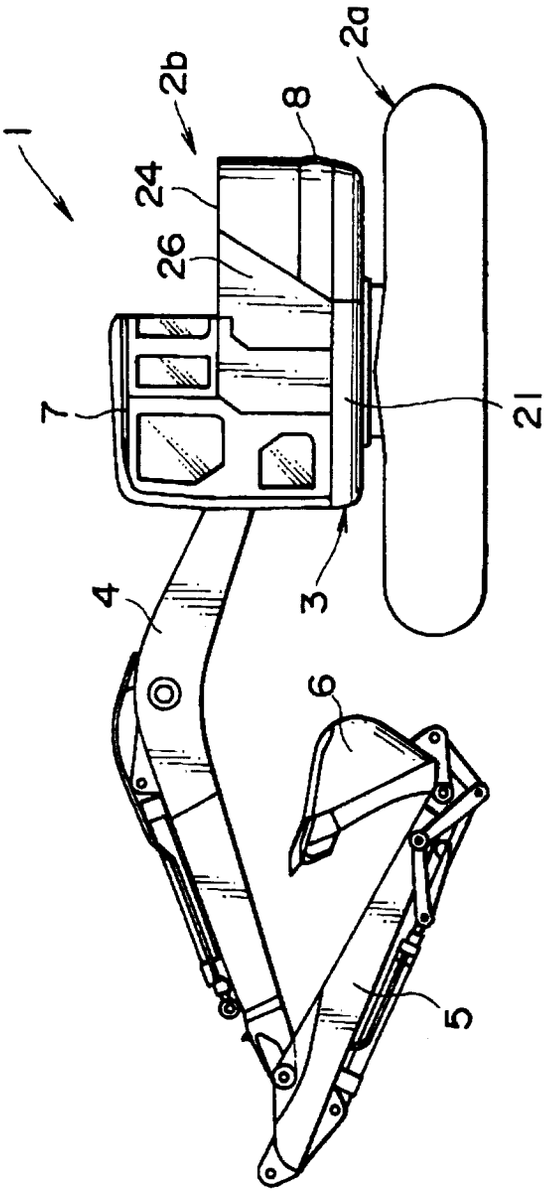


FIG. 2

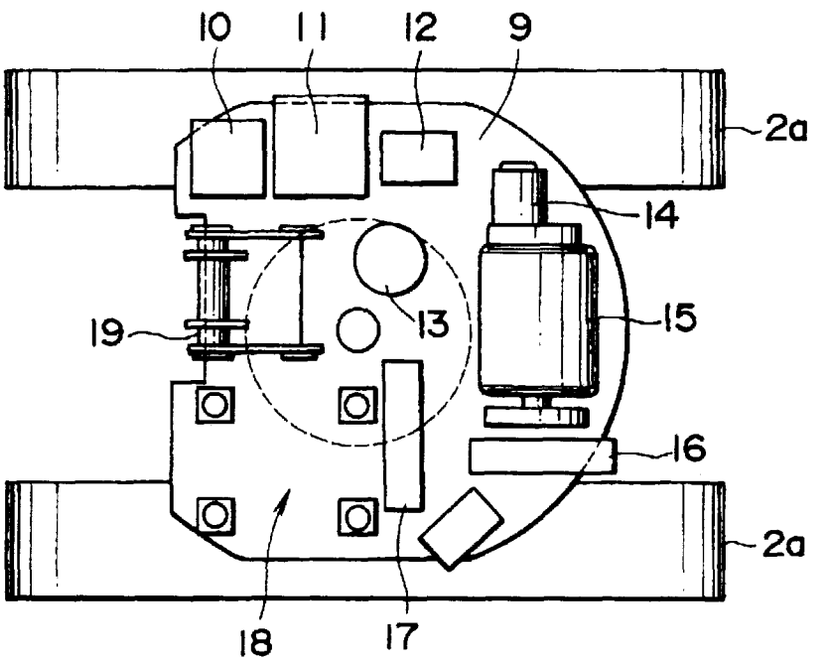


FIG. 3a

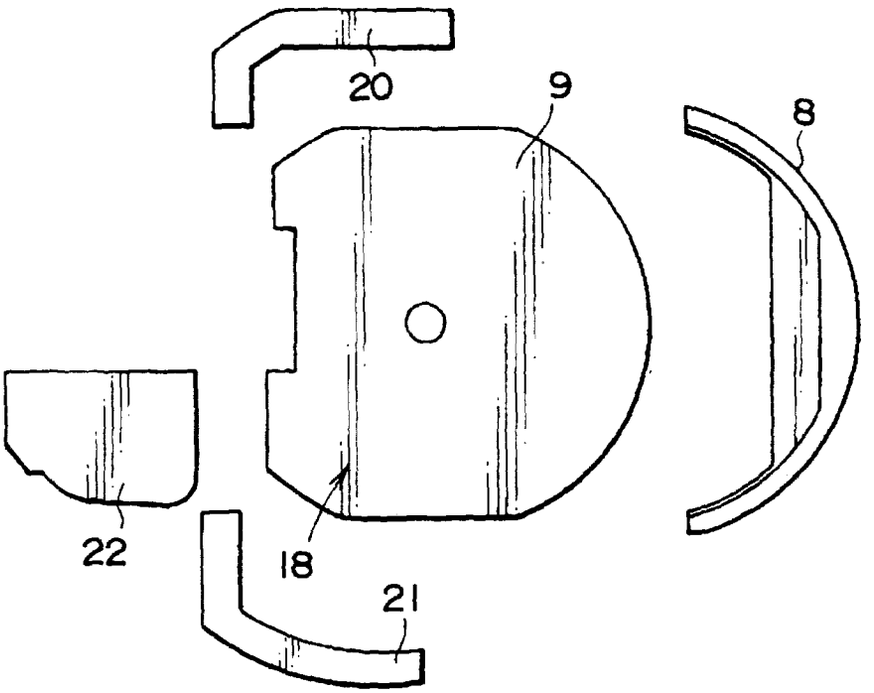


FIG. 3b

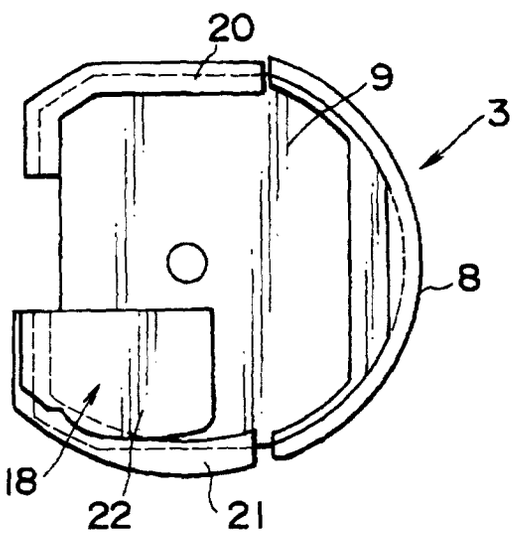
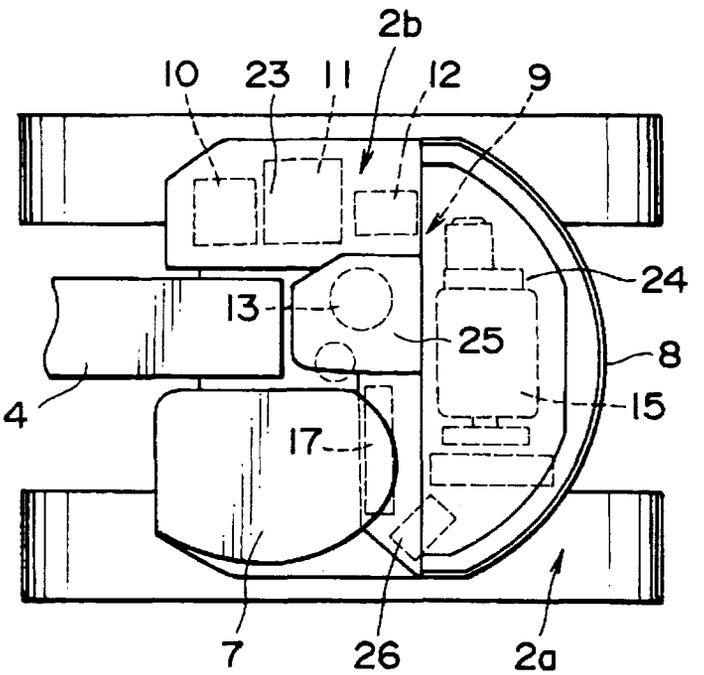


FIG. 4



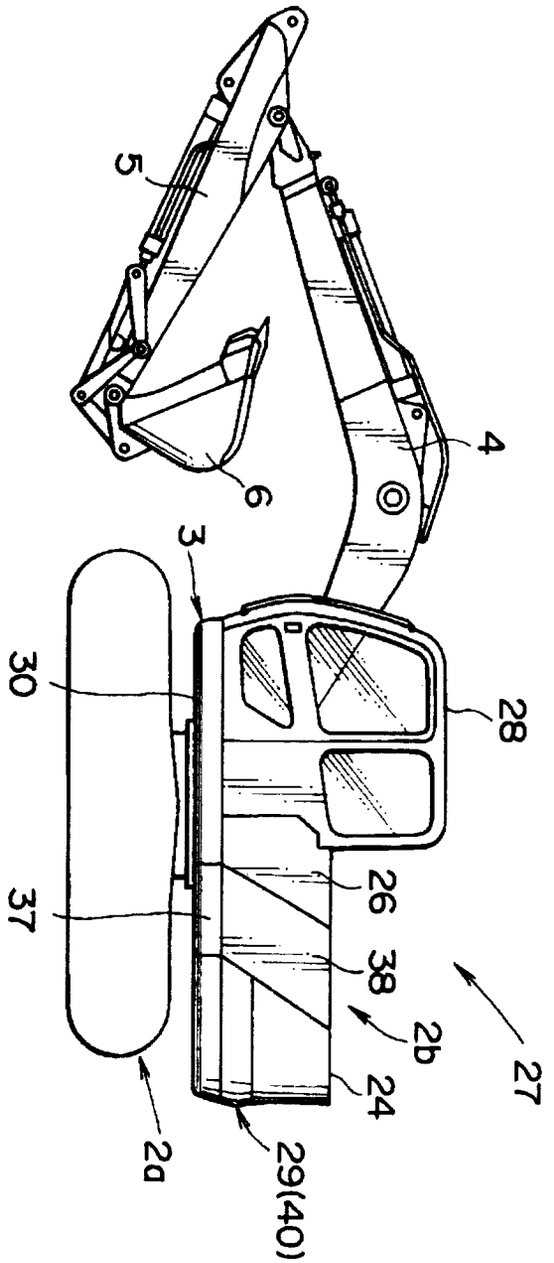


FIG. 5

FIG. 6a

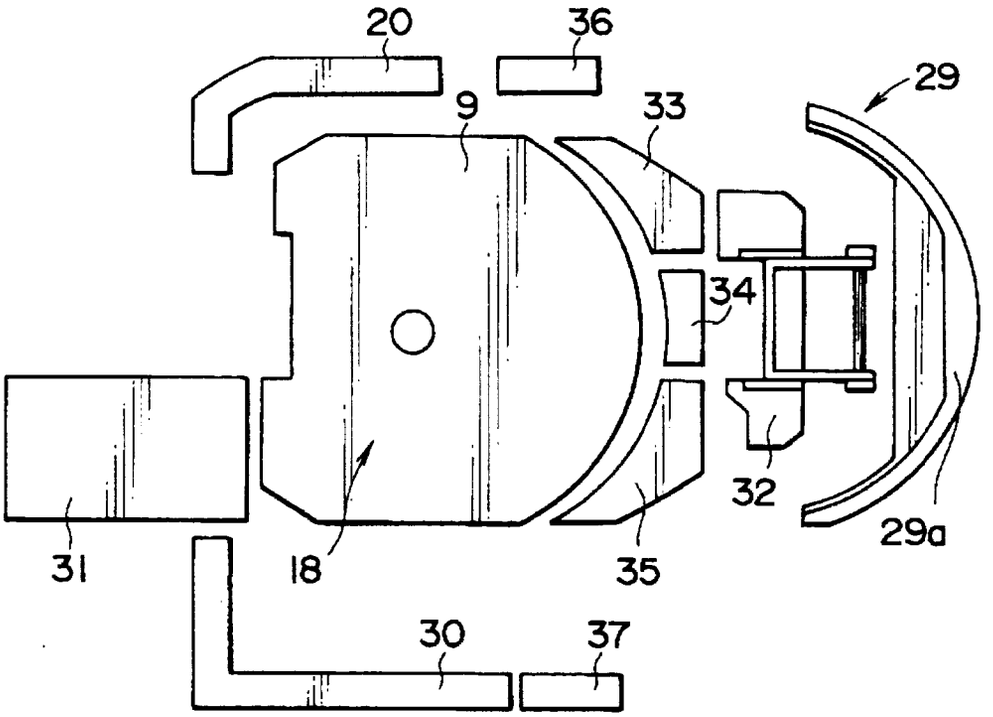

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FIG. 6b

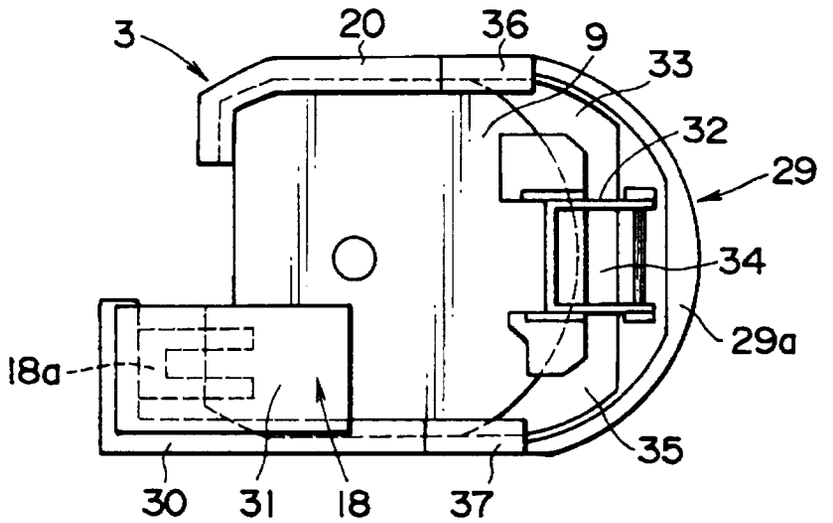
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FIG. 7

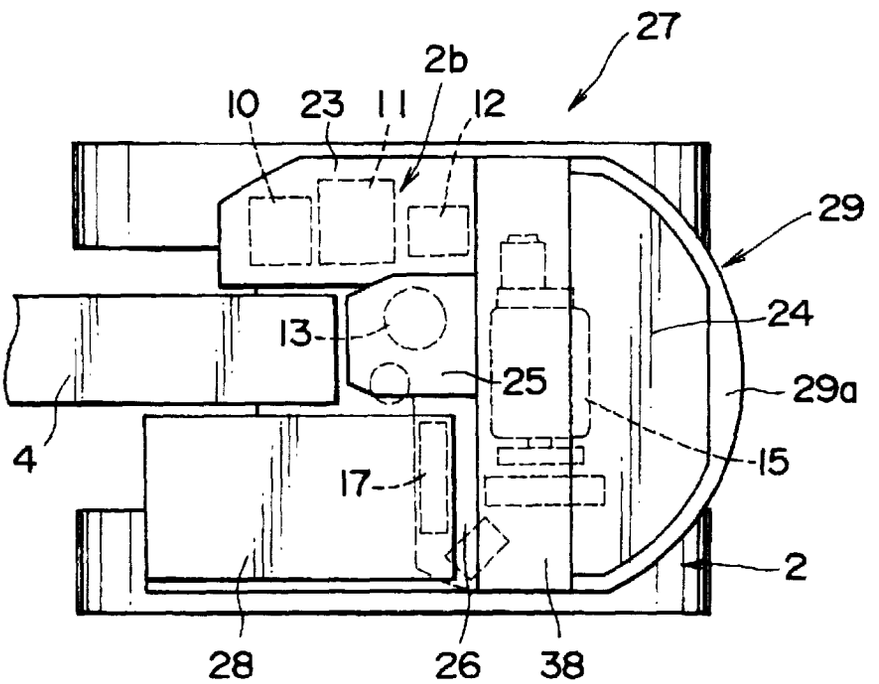


FIG. 8a

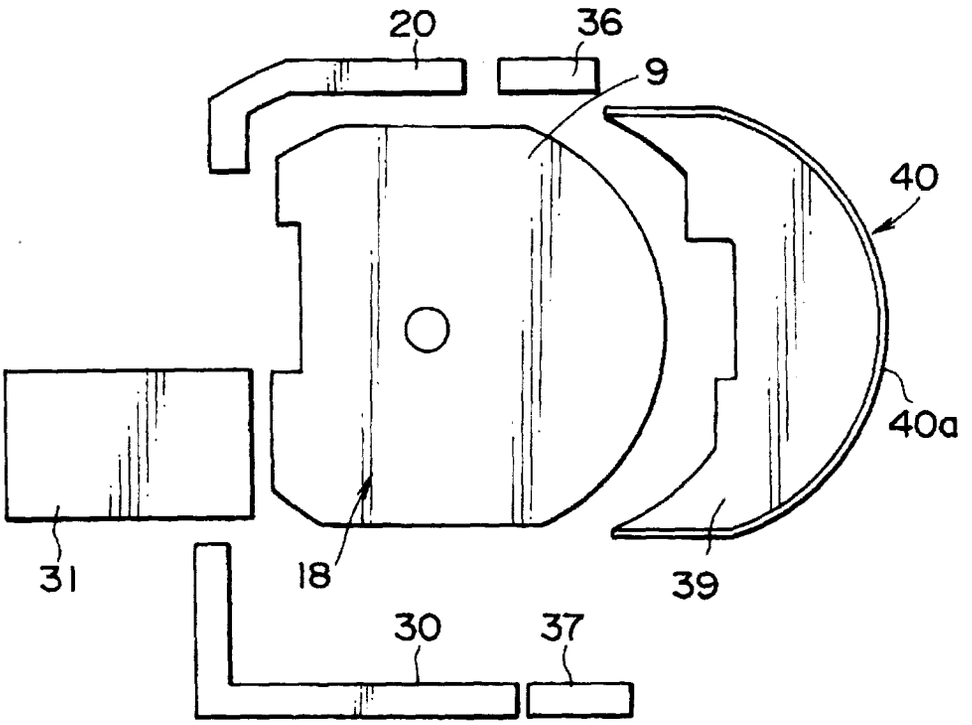
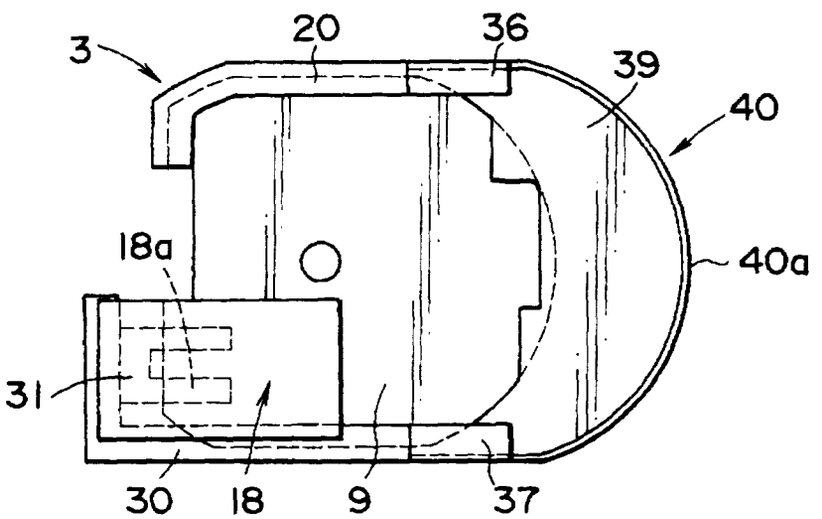


FIG. 8b



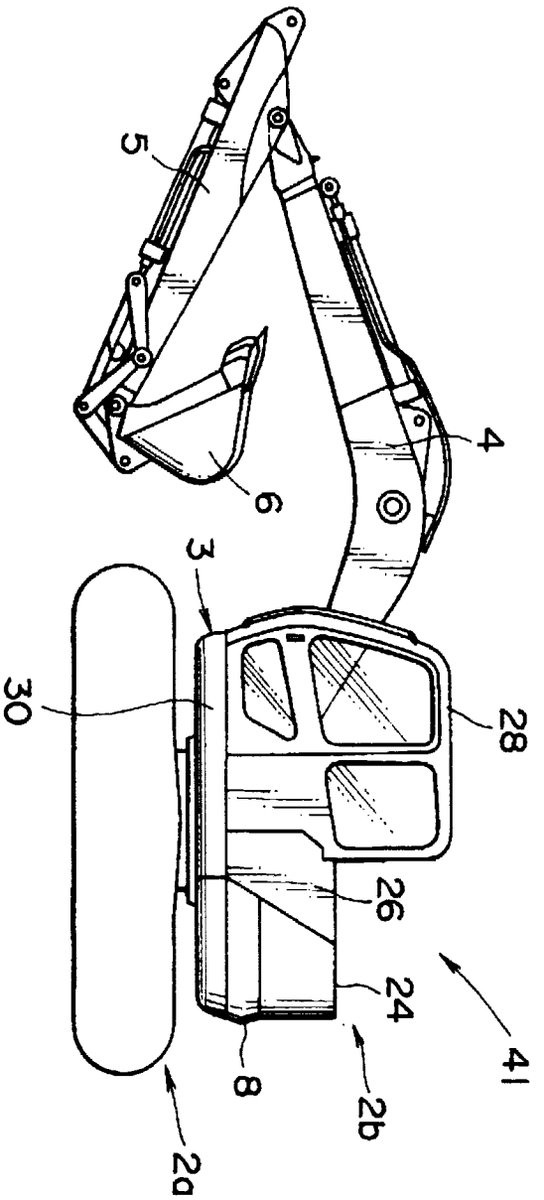


FIG. 9

FIG. 10a

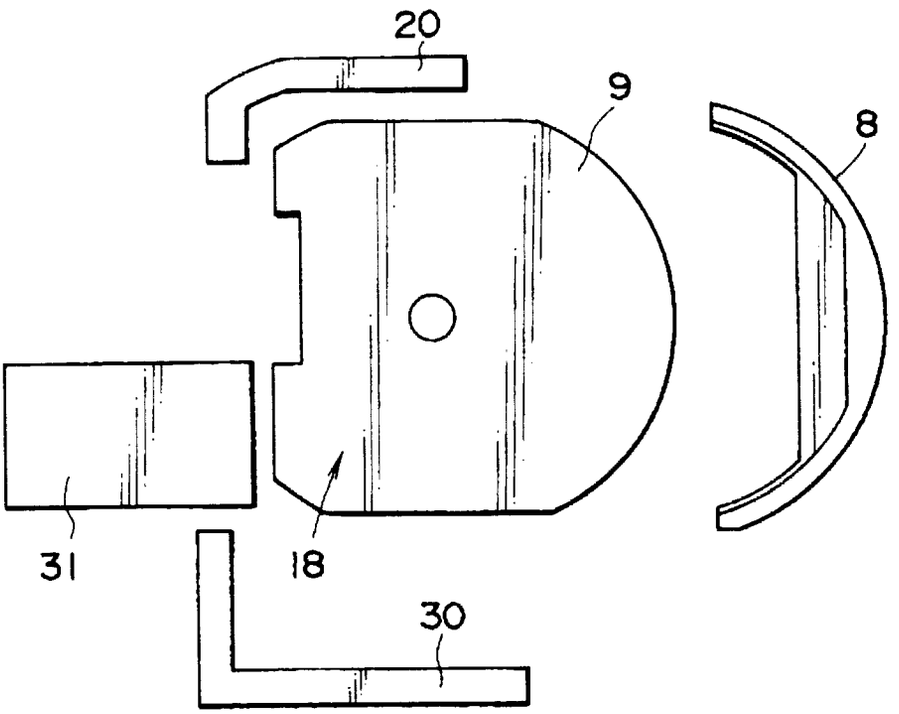


FIG. 10b

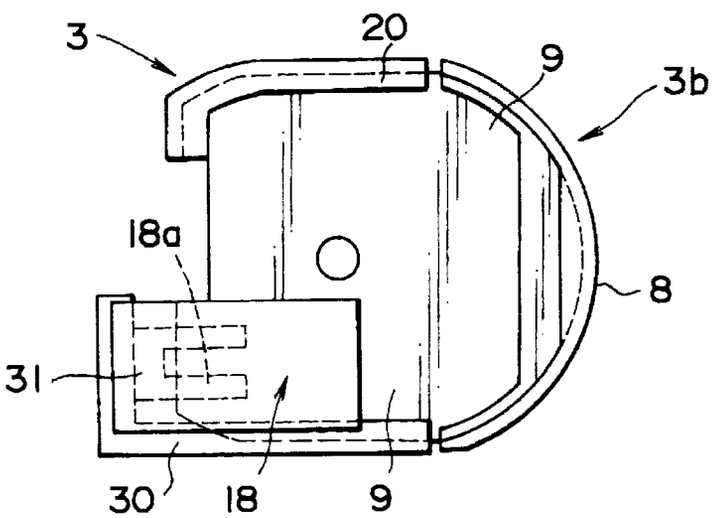


FIG. 11

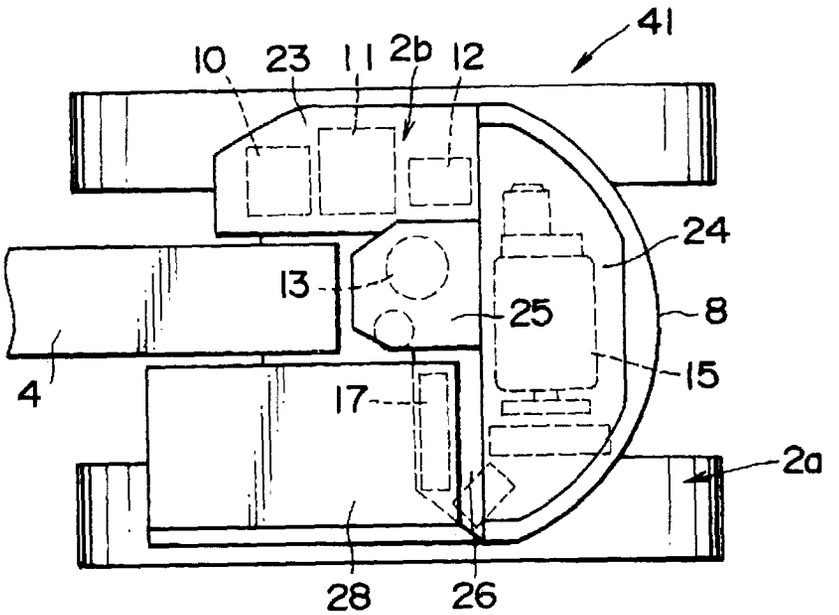

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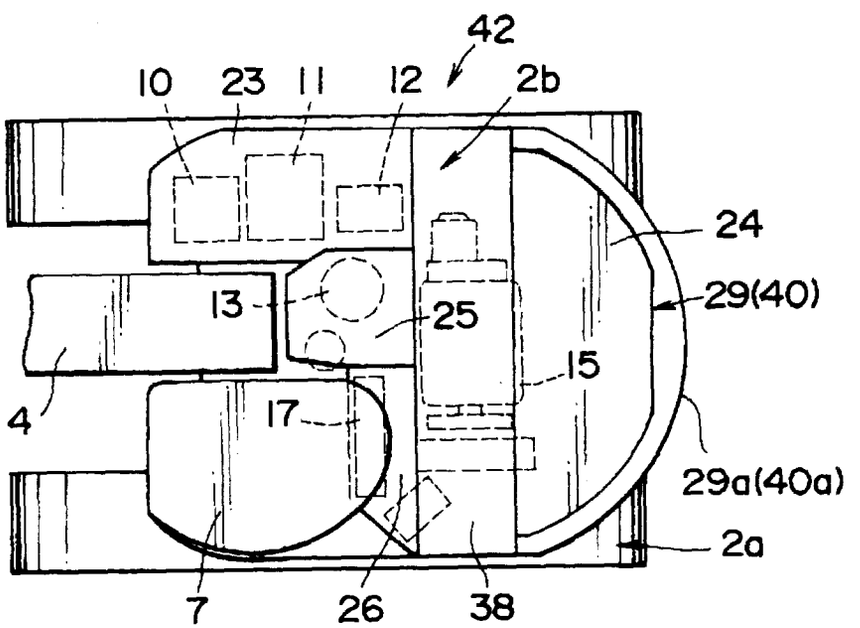
FIG. 12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29a(40a)
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