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**Smith**

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(54) **ADJUSTABLE BLENDER PUMP MOUNT  
FOR HYDRAULIC FRACTURING**

(71) Applicant: **STEWART & STEVENSON LLC**,  
Houston, TX (US)

(72) Inventor: **Harrison Smith**, Houston, TX (US)

(73) Assignee: **STEWART & STEVENSON LLC**,  
Houston, TX (US)

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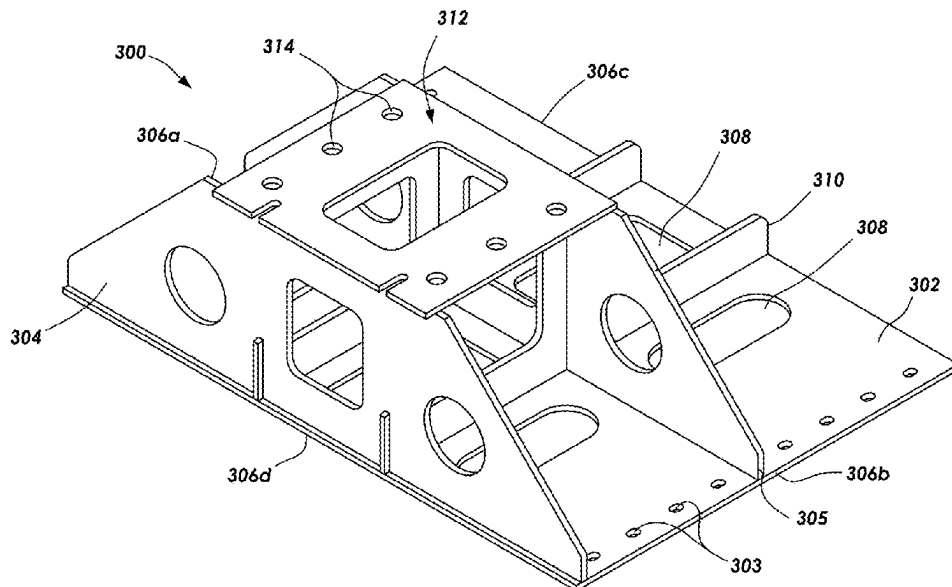
*Primary Examiner* — Bayan Salone

(74) *Attorney, Agent, or Firm* — Ewing & Jones, PLLC

(57) **ABSTRACT**

A blender system includes a skid and a blender assembly, the  
blender assembly including a blender tub and the blender tub  
including an outlet. The blender system also includes a  
discharge pump, the discharge pump coupled to the outlet  
and an adjustable mount, the adjustable mount supporting  
the discharge pump. The adjustable mount includes a bottom  
plate, the bottom plate including a plurality of rows of slots  
and two side gussets, the side gussets having tabs, the tabs  
inserted in the rows of slots of the bottom plate. In addition,  
the adjustable mount includes a top plate, the top plate  
positioned perpendicularly to the two side gussets and in  
parallel with the bottom plate. The top plate is affixed to the  
side gussets and to the discharge pump.

**9 Claims, 5 Drawing Sheets**



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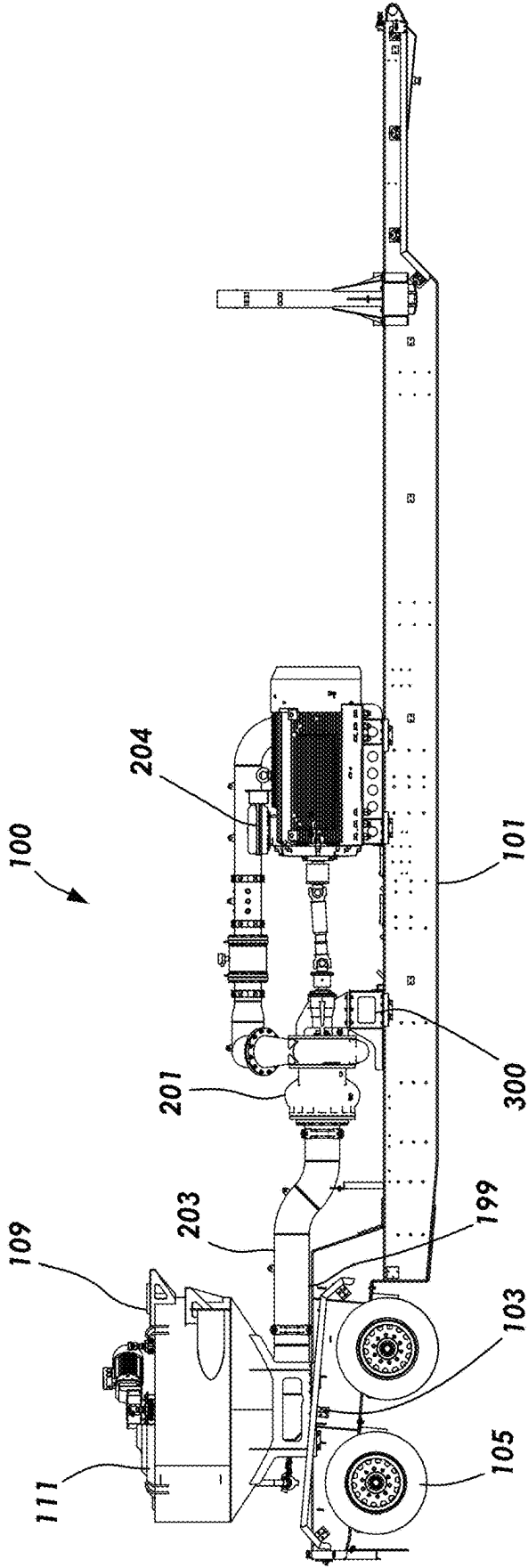
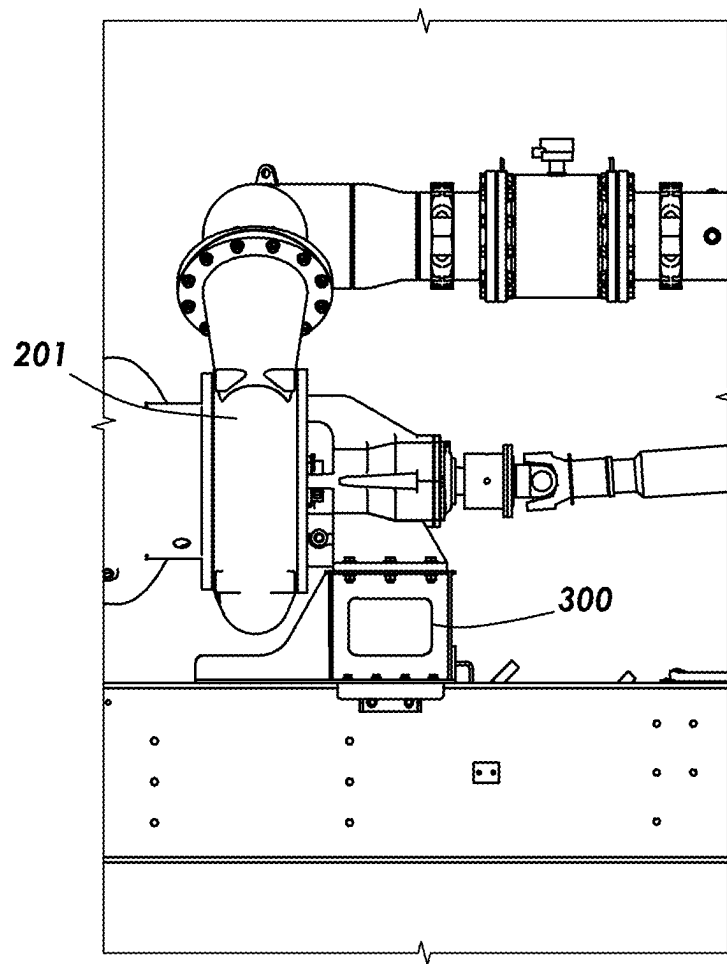
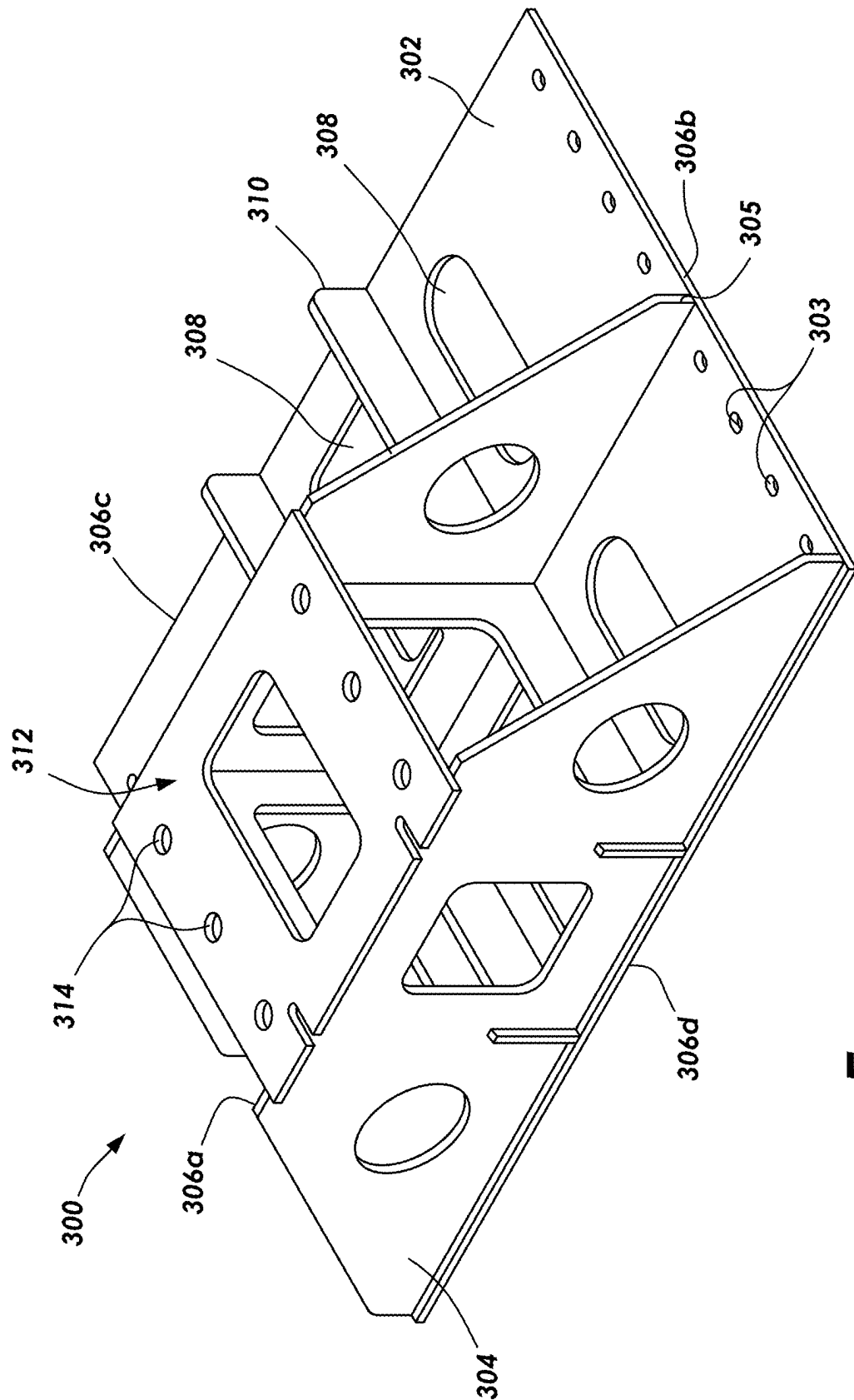


FIG. 1

**FIG. 2**



**FIG. 3**

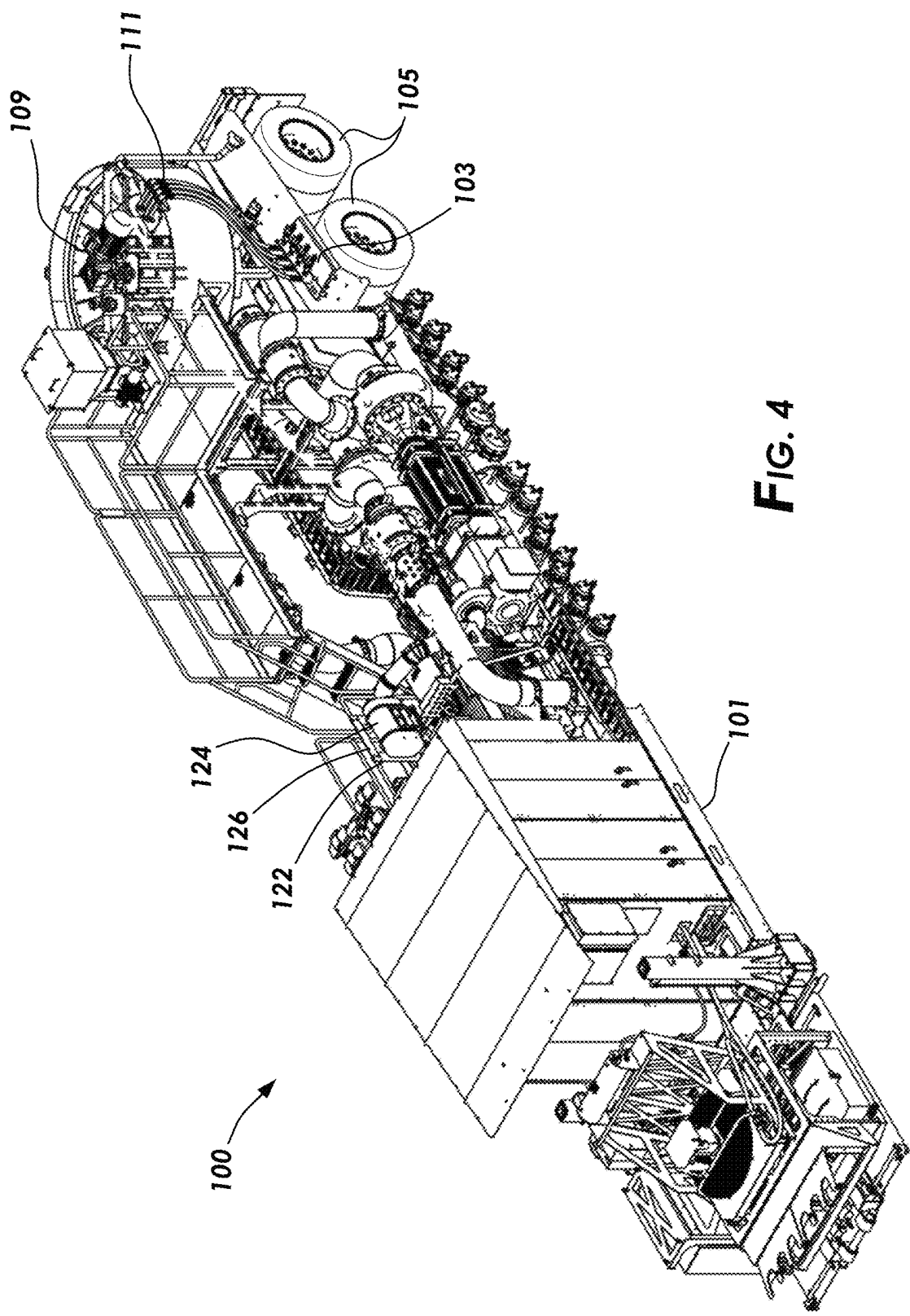


FIG. 4

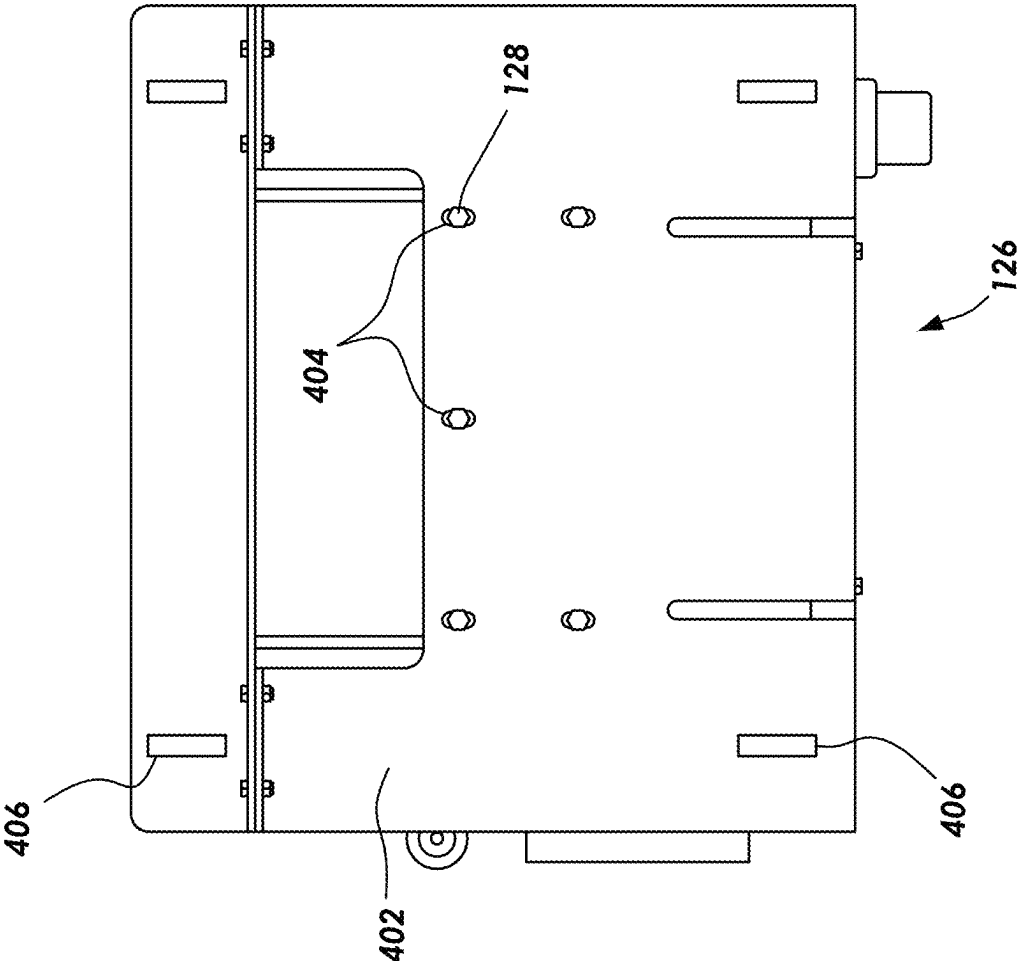


FIG. 5a

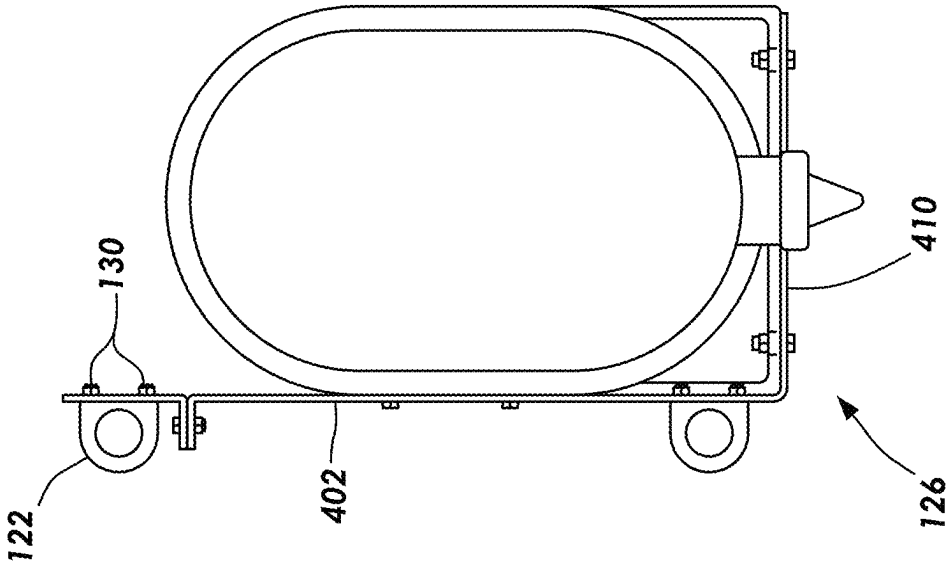


FIG. 5b

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## ADJUSTABLE BLENDER PUMP MOUNT FOR HYDRAULIC FRACTURING

### CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a nonprovisional application which claims priority from U.S. provisional application No. 63/543,235, filed Oct. 9, 2023, which is incorporated by reference herein in its entirety.

### TECHNICAL FIELD/FIELD OF THE DISCLOSURE

The present disclosure relates generally to well service equipment and specifically to equipment used with well fluids.

### BACKGROUND OF THE DISCLOSURE

During drilling, completion, and production operations, fluids are circulated through a wellbore. Various chemicals are introduced into the fluids, referred to herein as the slurry, to produce slurry having desirable characteristics. In some cases, chemicals may be provided in dry form. Such chemicals and fluid may be mixed in a blender system.

### SUMMARY

A blender system is disclosed. The blender system includes a skid and a blender assembly, the blender assembly including a blender tub and the blender tub including an outlet. The blender system also includes a discharge pump, the discharge pump coupled to the outlet and an adjustable mount, the adjustable mount supporting the discharge pump. The adjustable mount includes a bottom plate, the bottom plate including a plurality of rows of slots and two side gussets, the side gussets having tabs, the tabs inserted in the rows of slots of the bottom plate. In addition, the adjustable mount includes a top plate, the top plate positioned perpendicularly to the two side gussets and in parallel with the bottom plate. The top plate is affixed to the side gussets and to the discharge pump.

A method of mounting a discharge pump is disclosed. The method includes positioning a discharge pump and supplying an adjustable mount. The adjustable mount includes a bottom plate, the bottom plate including a plurality of rows of slots and two side gussets, the side gussets having tabs, the tabs inserted in the rows of slots of the bottom plate. The adjustable mount also includes a top plate, the top plate positioned perpendicularly to the two side gussets and in parallel with the bottom plate, the top plate affixed to the side gussets. The method also includes orienting the adjustable mount so as to support the discharge pump by adjusting the position of the two side gussets with respect to the bottom plate. The method also includes supporting the discharge pump with the adjustable mount.

A method of mounting an air filter to a side support is disclosed. The method includes supplying a side support, the side support including tabs, and affixing an air filter adjustable mount. The air filter adjustable mount includes a back plate, the back plate including slots and a side plate, the side plate either affixed to or integral to the back plate, the side plate perpendicular to the back plate. The method also includes adjusting the tabs so that the tabs fit within the slots and positioning the air filter within the air filter adjustable mount.

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## BRIEF DESCRIPTION OF THE DRAWINGS

The present disclosure is best understood from the following detailed description when read with the accompanying figures. It is emphasized that, in accordance with the standard practice in the industry, various features are not drawn to scale. In fact, the dimensions of the various features may be arbitrarily increased or reduced for clarity of discussion.

FIG. 1 depicts a side view of a blender system consistent with at least one embodiment of the present disclosure.

FIG. 2 is an expanded side view of the blender system of FIG. 1 showing an adjustable mount consistent with at least one embodiment of the present disclosure.

FIG. 3 depicts an adjustable mount consistent with certain embodiments of the present disclosure.

FIG. 4 depicts a blender system with a side-mounted air filter with an air filter adjustable mount consistent with certain embodiments of the present disclosure.

FIG. 5a depicts a rear view of an air filter adjustable mount consistent with certain embodiments of the present disclosure.

FIG. 5b depicts a side view of an air filter adjustable mount consistent with certain embodiments of the present disclosure.

### DETAILED DESCRIPTION

It is to be understood that the following disclosure provides many different embodiments, or examples, for implementing different features of various embodiments. Specific examples of components and arrangements are described below to simplify the present disclosure. These are, of course, merely examples and are not intended to be limiting. In addition, the present disclosure may repeat reference numerals and/or letters in the various examples. This repetition is for the purpose of simplicity and clarity and does not in itself dictate a relationship between the various embodiments and/or configurations discussed.

FIG. 1 depicts blender system 100. Blender system 100 may be used to prepare fluids for use in wellbore operations including stimulation operations such as hydraulic fracturing operation. For the purposes of this disclosure and without any intent to limit the scope of this disclosure, the fluids prepared by blender system 100 are referred to herein as a slurry made up of ingredients, chemicals, products, and base fluids as understood in the art such as, for example and without limitation, friction reducer, high viscosity friction reducer, guar or synthetic gel, inhibitors, PH buffers, and biocides.

In some embodiments, blender system 100 may include skid 101. Skid 101 may support components of blender system 100 and may provide for transportation of blender system 100 while allowing all components thereof to remain operatively coupled. In some embodiments, skid 101 may be positioned on or may be part of trailer 103 that includes one or more wheels 105 positioned to allow blender system 100 to be transported by towing. In some such embodiments, trailer 103 may be a rockover trailer. In certain embodiments, skid 101 may be mounted on a truck chassis.

Blender system 100 may include blender assembly 109. Blender assembly 109 may be adapted to mix one or more ingredients, chemicals, and products with a base fluid to generate a slurry used, for example and without limitation, in a wellbore stimulation operation such as a hydraulic fracturing operation. Blender assembly 109 may include blender tub 111.



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In some embodiments, blender tub **111** may include outlet **199** positioned at the base of blender tub **111**. Outlet **199** may be fluidly coupled to discharge pump **201** by outlet pipe **203**. In certain embodiments, such as the one shown in FIGS. **1** and **2**, discharge pump **201** may be a centrifugal pump, although any suitable pump may be used. Discharge pump **201** may be driven by discharge pump motor **204**. In some embodiments, discharge pump motor **204** may be an electric motor.

Discharge pump **201** may be supported, at least in part, by adjustable mount **300**. Adjustable mount **300** may adjust to accommodate a variety of discharge pump **201** designs. Thus, discharge pump **201** may be removed without also removing adjustable mount **300**. FIG. **2** shows adjustable mount **300** in place with discharge pump **201**.

FIG. **3** depicts adjustable mount **300** consistent with certain embodiments of the present disclosure. Adjustable mount **300** includes bottom plate **302**. Bottom plate **302** includes slots **303** for mounting side gussets **304**. Slots **303** may be positioned in rows along sides **306a**, **306b** of bottom plate **302**, in certain embodiments. Side gussets **304** include tabs **305** for insertion into slots **303** to hold side gussets **304** in place with respect to bottom plate **302**, but allow for limited movement inside side gusset **304** placement along bottom plate **302**. For example, in certain embodiments, slots may be between  $\frac{1}{4}$ " and  $\frac{3}{4}$ " wide, or, for example,  $\frac{1}{2}$ " wide, to allow for misalignment between discharge pump **201** and skid **101**. In certain embodiments, side gussets **304** may be positioned perpendicularly or approximately perpendicularly, i.e., at an angle between 75 degrees and 105 degrees, to bottom plate **302**.

In some embodiments, bottom plate **302** may include cutouts **308** to reduce the weight of adjustable mount **300**. In addition, support cross plates **310** may be connected to bottom plate **302** to provide structural support for adjustable mount **300**. Support cross plates **310** may be placed perpendicular or approximately perpendicular to bottom plate **302** and side gussets **304**. Support cross plates **310** may extend across bottom plate **302** from side **306c** to **306d**.

Side gussets **304** may support top plate **312**. Top plate **312** may be positioned perpendicularly or approximately perpendicularly to side gussets **304** and parallel or approximately parallel to bottom plate **302**. As shown in FIGS. **1** and **2**, top plate **312** may mount to discharge pump **201**, thereby providing support to discharge pump **201**. Mounting top plate **312** to discharge pump **201** may be accomplished through the use of mounting holes **314** in top plate **312**.

As described above, adjustable mount **300** may accommodate a number of different types of discharge pumps **201**. Before adjustable mount **300** is set in place, adjustable mount **300** may be adjusted by moving side gussets **304** along the rows of slots **303** in bottom plate **302** and within slots **303** within tabs **305**. In certain embodiments, once adjustments have been made, adjustable mount **300** may be set in place. In other embodiments, once adjustments have been made, bottom plate **302**, side gussets **304** and top plate **312** may be affixed together, such as by welding, and then set in place.

As shown in FIG. **4**, side support **122** may be affixed to air filter adjustable mount **126**, which may hold air filter **124**. Side support **122** may be affixed to skid **101**.

FIGS. **5a** and **5b** depict a rear view and side view of air filter adjustable mount **126**. FIG. **5a** shows back plate **402** of air filter adjustable mount **126**. Back plate **402** includes a plurality of mounting holes **404** for mounting air filter **124**, such as by fasteners **128**. Fasteners **128** may be screws, bolts

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or other fastening devices. Back plate **402** further includes a plurality of slots **406** for mounting air filter adjustable mount **126** to side support **122**. Slots **406** may be, for instance, between  $\frac{1}{4}$ " and 1" long so that tabs **130** (shown in FIG. **5b**) of side support **122** may be adjustable within the length of slots **406**.

FIG. **5b** depicts back plate **402** and bottom plate **410**. In certain embodiments, back plate **402** and bottom plate **410** may be integral, i.e., a single piece. In other embodiments, back plate **402** and bottom plate **410** may be separate pieces that have been welded or otherwise affixed. Back plate **402** and bottom plate **410** may be perpendicular or approximately perpendicular to one another. Air filter **124** may sit within air filter adjustable mount **126**.

The foregoing outlines features of several embodiments so that a person of ordinary skill in the art may better understand the aspects of the present disclosure. Such features may be replaced by any one of numerous equivalent alternatives, only some of which are disclosed herein. One of ordinary skill in the art should appreciate that they may readily use the present disclosure as a basis for designing or modifying other processes and structures for carrying out the same purposes and/or achieving the same advantages of the embodiments introduced herein. One of ordinary skill in the art should also realize that such equivalent constructions do not depart from the spirit and scope of the present disclosure and that they may make various changes, substitutions, and alterations herein without departing from the spirit and scope of the present disclosure.

The invention claimed is:

1. A method of mounting a discharge pump comprising: positioning the discharge pump; supplying an adjustable mount, the adjustable mount including:
  - a bottom plate, the bottom plate including a plurality of rows of slots;
  - two side gussets, the side gussets having tabs, the tabs inserted in the rows of slots of the bottom plate;
  - a top plate, the top plate positioned perpendicularly to the two side gussets and in parallel with the bottom plate, the top plate affixed to the side gussets;
 orienting the adjustable mount so as to support the discharge pump by adjusting the position of the two side gussets with respect to the bottom plate; and supporting the discharge pump with the adjustable mount.
2. The method of claim 1, wherein the step of adjusting the position of the two side gussets includes moving the tabs within the slots.
3. The method of claim 1 further comprising prior to supporting the discharge pump with the adjustable mount: welding the bottom plate to the side gussets; and welding the side gussets to the top plate.
4. The method of claim 1, wherein the adjustable mount further includes cutouts.
5. The method of claim 1, wherein the adjustable mount further includes a support cross plate, the support cross plate connected to the bottom plate and perpendicular to the two side gussets and the bottom plate.
6. The method of claim 1, wherein the top plate has mounting holes.
7. The method of claim 1, wherein the slots are between  $\frac{1}{4}$ " and  $\frac{3}{4}$ " wide.
8. The method of claim 1, wherein the slots are  $\frac{1}{2}$ " wide.
9. The method of claim 1, wherein the discharge pump is a centrifugal pump.

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