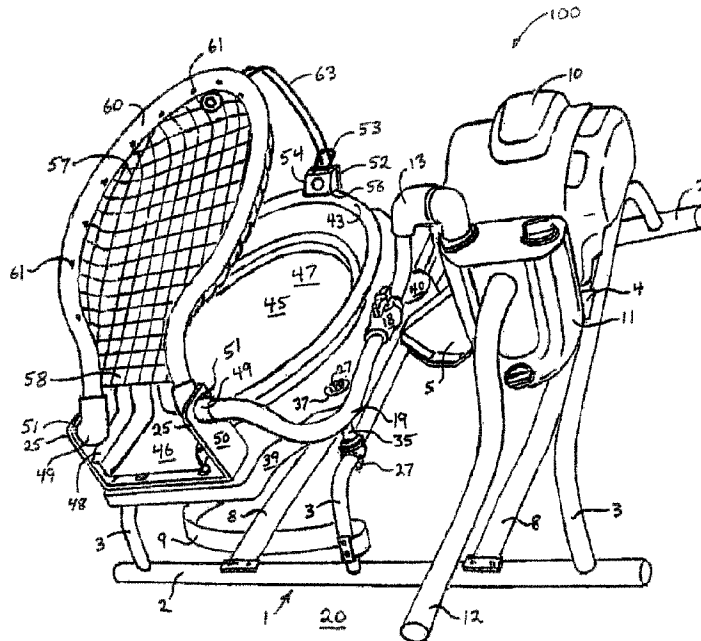




(86) Date de dépôt PCT/PCT Filing Date: 2017/12/22
 (87) Date publication PCT/PCT Publication Date: 2018/06/28
 (45) Date de délivrance/Issue Date: 2022/10/25
 (85) Entrée phase nationale/National Entry: 2019/06/21
 (86) N° demande PCT/PCT Application No.: CA 2017/051602
 (87) N° publication PCT/PCT Publication No.: 2018/112668
 (30) Priorité/Priority: 2016/12/22 (US62/498,334)

(51) Cl.Int./Int.Cl. *B03B 5/02* (2006.01)
 (72) Inventeur/Inventor:
 WANNOP, GEORGE, CA
 (73) Propriétaire/Owner:
 WANNOP, GEORGE, CA
 (74) Agent: OYEN WIGGS GREEN & MUTALA LLP

(54) Titre : MACHINE DE LAVAGE DE L'OR A LA BATEE
 (54) Title: GOLD PANNING MACHINE



(57) Abrégé/Abstract:

An apparatus and method for separating heavy metals and precious stones from alluvial material wherein the apparatus comprises a frame, a gold pan supported on the frame and a vibration means supported on the frame adapted to provide a vibration to the gold pan. The apparatus may further comprise a water pump supported on the frame operable to introduce a quantity of water to the gold pan. The apparatus may further comprise a screen supported above the gold pan. The method comprises providing a gold pan supported on a frame, introducing a quantity of an alluvial material to the gold pan and vibrating the gold pan so as to remove lighter material leaving the heavy metals and precious stones therein.

ABSTRACT

An apparatus and method for separating heavy metals and precious stones from alluvial material wherein the apparatus comprises a frame, a gold pan supported on the frame and a vibration means supported on the frame adapted to provide a vibration to the gold pan. The apparatus may further comprise a water pump supported on the frame operable to introduce a quantity of water to the gold pan. The apparatus may further comprise a screen supported above the gold pan. The method comprises providing a gold pan supported on a frame, introducing a quantity of an alluvial material to the gold pan and vibrating the gold pan so as to remove lighter material leaving the heavy metals and precious stones therein.

GOLD PANNING MACHINE

BACKGROUND OF THE INVENTION

1. Field of Invention

5 This invention relates to the separation of gold particles from gold bearing alluvial material. More particularly, it relates to the provision of a gold pan machine which includes a frame on which is mounted a gold pan with a screen with a method of vibrating the gold pan and pumping water to the gold pan. It is compact with shoulder straps for backpacking distances and
10 comprises a complete set-up in one lightweight unit.

2. Description of Related Art

Hand-held gold pans have been used for many years for separating gold particles from alluvial material. Depending on the experience of the person
15 gold panning, the process can be slow and some of the gold particles can easily be lost in the process. Sluice boxes have also been used for many years which speed up the process but are generally bulky and heavy and can lose a significant percentage of the gold also depending on experience and how well it is set up regarding angle of slope and the amount of water flow.

20

SUMMARY OF THE INVENTION

According to a first embodiment of the present invention there is disclosed an apparatus for separating heavy metals and precious stones from alluvial material comprising a frame, a gold pan supported on the frame and a
25 vibration means supported on the frame adapted to provide a vibration to the gold pan;

The frame comprises a plurality of base members and a plurality of cross-members which span between and connect the base members together, the
30 cross-members providing a raised central section.

-2-

The apparatus may further comprise a plurality of flexible mounts fastened on top of the raised central section of the frame for operably supporting the gold pan.

5 The apparatus may further comprise a platform mounted on and retained by the plurality of flexible mounts, the platform's upper surface shaped to retain the gold pan from horizontal movement relative to the platform, and wherein a side portion of the platform is formed to connect the platform to the vibration means causing the platform and the gold pan to vibrate relative to the frame.

10

The vibration means may be comprised of a bearing connected to the platform, the bearing mounted on an offset-from-center portion of a cam and the cam mounted on a shaft rotated by the drive means, thus when the drive means rotates the shaft, the shaft rotates the cam and moves the bearing in an eccentric circle vibrating the platform.

15

The gold pan may be bowl shaped with a generally flat central bottom section and sides extending upward on an outward angle and a top circumferential rim extending horizontally outward, and a spillway formed on the front side of the gold pan, the spillway having a flat bottom, vertical sides, and an open front allowing lighter material to flow out.

20

The apparatus may further comprise a hinge bracket attached to the front section of the platform formed with two vertical ends each with a circular hole formed near their top ends and wherein the gold pan spillway is retained between the vertical ends of the hinge bracket.

25

The apparatus may further comprise a gold pan retaining bracket attached to the back end of the platform with a raised horizontal flat portion for the back rim of gold pan to sit on, and further comprising a lock block fastened onto the top vertical end section of the gold pan retaining bracket providing a locking slot between the bottom of the lock block and the top of the horizontal flat portion and wherein when the gold pan rim is pushed down against an inside

30

-3-

sloped face of the lock block, the gold pan retaining bracket flexes outward and when the gold pan rim lines up with the locking slot the gold pan retaining bracket springs back inward locking the gold pan rim into the locking slot.

5 The apparatus may further comprise a rectangular pan release lever wherein the lower portion of the release lever is pivotally retained in vertical slots formed in the rear face of the lock block with the release levers lower horizontal end positioned in the locking slot wherein when the top of the release lever is pressed outward the release levers mid-section presses
10 against the top end of the gold pan retaining bracket pivoting the lower end of the release lever to move inward through the locking slot to push the gold pans rim out of the locking slot for removal of the gold pan.

15 The apparatus may further comprise a water pump supported on the frame operable to introduce a quantity of water to the gold pan. The apparatus may further comprise a water spray tube comprising an upper hollow portion for water flow and a lower portion formed to create a channel lengthwise on the bottom the spray tube. A length of the spray tube with the channel opening facing inward, is bent to a similar shape as the outer rim of the gold pan with
20 its two end sections formed to follow the outer edge of the spillway sides on the gold pan. The ends of the spray tube bend at a right angle outward to act as hinge pins through the holes in vertical ends of the hinge bracket, the water spray tube further comprising several small holes on its inward face to spray water inward, and wherein the right angle bend section of the spray tube ends
25 hold down the gold pan spillway.

30 The apparatus may further comprise a screen supported above the gold pan. The screen may be cut in the shape of the spray tube channel wherein the screens edge is fitted into and retained by the channel when the threaded ends of the spray tube are fitted through the holes in the vertical ends of the hinge bracket and therein also providing a screen spillway on the flat section of screen between the two ends of the spray tube, and therefore also providing alignment and pivoting of the spray tube and the screen allowing the

-4-

5 screens opposite end to be tilted up so large gravel will roll through and off the screen spillway while small material will fall through the screen holes into the gold pan, and wherein one of the water spray tube ends is connected with a flexible hose to the water pump, and the other end of the water spray tube is sealed closed.

10 The apparatus may further comprise a heavy formed wire screen support pivotally attached to a screen support hinge fastened to the back end of the screen, wherein the screen support extends downward over outer face of the top vertical end section of the gold pan retaining bracket and wherein a bolt
15 extending through the lock block and the top vertical end section of the gold pan retaining bracket extends outward on which a locking clamp with a central hole is retained, the locking clamp having wings bent inward over the screen support wire, and further comprising a threaded retaining knob threaded onto the end of the bolt wherein when the retaining knob is tightened against the
20 locking clamp the screen support wire is locked in that position against the top vertical end section of the gold pan retaining bracket and when the retaining knob and the locking clamp are loosened the screen support wire can slide through the clamp to raise or lower rear portion of the spray tube and the screen.

25 Each of the flexible mounts may have a threaded stud extending downward from its lower end through holes in a raised area of the frame fastened with a locknut and a threaded stud extending upward from its upper end through holes in the platform fastened with a locknut.

30 According to a further embodiment of the present invention there is disclosed a method for separating heavy metals and precious stones from alluvial material comprising providing a gold pan supported on a frame, introducing a quantity of an alluvial material to the gold pan and vibrating the gold pan so as to remove lighter material leaving the heavy metals and precious stones therein.

-5-

The gold panning machine of the present invention is characterised by a gold pan mounted onto a platform which is supported by flexible supports mounted to a frame. The platform has a recess or hole centrally located in its top creating a seat to position and horizontally retain a gold pan. The gold pan has a spillway on one side raised above the bottom of the pan. A hinged screen with a spillway is mounted to the platform and extends over the top of the pan to separate and discard large material when it is locked into a tilted position. A water spray tube is attached around the top circumference of the screen. The frame is formed with lengthwise tubes to rest on the ground and a plurality of cross tubes connected to and extending across between the lengthwise tubes joining them together. A transmission is mounted between two of the cross tubes. An engine mounted to the transmission provides drive to the transmission and to a water pump mounted on the transmission which supplies water to the screen through the spray tube. The transmission drives a cam shaft. A cam, a bearing and a flexible cam cap on top of the bearing is connected to the platform to vibrate the platform, pan and screen.

In use, the engine drives the water pump to supply water to the screen and drives the transmission to vibrate the platform, pan and screen. The screen is locked into a tilted upward position. Gold bearing gravel is shovelled onto the screen where large gravel slides out the spillway and small gravel falls through the screen into the pan. The vibration and water in the pan causes the heaviest particles including gold to drift down and settle to the bottom of the pan. When the volume of gravel in the pan exceeds the height of the spillway on the pan, the lighter gravel will drift through and fall out of the spillway on the pan. Continue to shovel material onto the screen for any length of time and the heaviest metals and stones will continue to accumulate in the bottom of the pan. To finish and recover the gold, remove the pan from the platform and separate the gold from the remaining gravel panning by hand.

In one form the base of the machine is a frame formed with lengthwise tubes to rest on the ground and a plurality of cross tubes connected to and extending across between the lengthwise tubes joining them together to form a frame. The

-6-

cross-tubes are formed to extend downward at each end with a flat center section creating a raised support area on each cross tube. The sample shown in the drawing has three cross tubes. Backpack cross straps fastened to the lengthwise tubes provide frame reinforcement and shoulder straps are fastened to the cross tubes. Central between and connected to two of the cross tubes is a structural member which provides a transmission mount. The transmission is mounted with bolts and nuts on top of the transmission mount. The engine is mounted onto one side of the transmission. The water pump is mounted onto the other side of the transmission. The water pump has a water intake hose and an outlet hose which sends pressurised water to a spray tube attached to the top of the screen. A valve is fitted into the water line leading to the spray tube for adjustment of the water flow. The transmission transmits rotational drive from the engine to a cam shaft which spins a cam with a bearing attached to its top offset-from-center portion.

The four flexible mounts may be attached to the top of the flat sections of two of the cross tubes by means of a threaded stud molded into the bottom of each flexible mount extending through a hole in the cross tube and a nut fastened to the threaded stud protruding through the bottom of the cross tube. A similar stud is molded into the top of each flexible mount with its threaded stud pointing upward through four mount retainer holes, one close to each corner of the platform and nuts threaded onto each stud to retain the platform. The platform has a formed pocket or hole which rests on top of and around the sides of the bearing and rubber cap so that the rubber cap is snugly fitted inside of the formed pocket, thus when the cam shaft is spinning the cam vibrates the bearing and rubber cap which vibrates the whole platform. The platform has a large central hole sized to fit in the bottom of the gold pan snugly. The pan is bowl shaped with a flat bottom and a spillway extends out of its front side to keep the material being panned confined and allowed to flow out through the spillway only. A hinge bracket is fastened to the front edge of the platform with bolts and nuts with its two ends bent upward at a right angle to a bottom flat portion attached to the platform. The vertical ends each have a hole large enough to serve as a pivot sleeve around a pipe fitting. The screen is formed

-7-

with a top rim extending radially outward and has a spillway formed on the front side. A water spray tube extends around and is fastened to the top edge of the screen. Water spray holes are located around the inner face of the spray tube to spray water toward the center of the screen. The left end of the spray tube is fitted through the hole in the left hand vertical end of the hinge bracket with a threaded end protruding out and an end cap threaded on. This end cap can be removed for washing out debris in the tube. The right end of the spray tube is fitted through the hole in the right hand vertical end of the hinge bracket with a threaded end protruding out and a water supply hose from the water pump threaded onto it. The spray tube ends act as hinge pins through the bracket thus providing the screen and spray tube to be pivotally retained in their position allowing the back end of the screen and spray tube to be pivoted up. An adjustable screen support is pivotally attached to the rear side of the screen. It is a formed piece of heavy wire extending down from the rear wall of the screen. A locking clamp has wings extending over the wire to press against the wire and lock it in place against a support bracket when a retaining knob on the bolt of the locking clamp extending through a hole in the support bracket is tightened. The screen support allows the screen to be pivoted up and locked at the desirable angle. The gold pan can be installed or removed when the screen is in a raised position. Install by sliding the spillway section between the vertical ends of the screen hinge bracket where the two ends of the spray tube hold it down in the correct position, then push down on the back end of the pan until the pan rim locks down under the front edge of the pan lock block. To remove the pan press down on the outer top end of the release lever, this pivots the lever against the top of the screen support bracket pushing the bottom end of the lever forward against the pan rim and kicking the pan out of the locking slot at which time the pan pops upward and is released for removal by lifting the pan up and out to one side.

30

Other aspects and features of the present invention will become apparent to those ordinarily skilled in the art upon review of the following description of

specific embodiments of the invention in conjunction with the accompanying figures.

BRIEF DESCRIPTION OF THE DRAWINGS

- 5 In drawings which illustrate embodiments of the invention wherein similar characters of reference denote corresponding parts in each view,
- Figure 1 is a front perspective view of an apparatus for separating heavy metals and precious stones from alluvial material according to a first embodiment of the present invention.
- 10 Figure 2 is a perspective view of the engine and transmission of the apparatus of Figure 1 with the water pump removed.
- Figure 3 is an exploded cross sectional view of the cam shaft, cam, ball bearing and cam cap of the apparatus of Figure 1.
- Figure 4 is a perspective view of the gold pan or receptacle of the apparatus of Figure 1.
- 15 Figure 5 is a rear perspective view of the platform, screen, screen support, hinge and pan locking mechanism of the apparatus of Figure 1.
- Figure 6 is a detailed cross section of the water spray tube of the apparatus of Figure 1.
- 20 Figure 7 is a detailed exploded view of the adjustable screen support and lock, and pan locking block and release lever of the apparatus of Figure 1.
- Figure 8 is a front perspective view of an apparatus for separating heavy metals and precious stones from alluvial material according to a further embodiment of the present invention.
- 25 Figure 9 is a front perspective view of an apparatus for separating heavy metals and precious stones from alluvial material according to a further embodiment of the present invention.
- 30 Figure 10 is a front perspective view of an apparatus for separating heavy metals and precious stones from alluvial material according to a further embodiment of the present invention.

DETAILED DESCRIPTION

Referring to Figure 1, an apparatus for separating heavy metals and precious stones from alluvial material according to a first embodiment of the invention is shown generally at 100. The apparatus 100 or gold panning
5 machine comprises a frame supporting a gold pan 45 adapted to be vibrated by a vibration source and a means for introducing water into the pan.

The base of the machine is a frame 1 best shown in Figure 1 formed with two
10 lengthwise tubes 2 to rest on the ground and a plurality of cross tubes 3 connected to and extending across between the lengthwise tubes 2 joining them together to form frame 1. The cross tubes 3 are formed to extend downward at each end with a flat center section creating a raised support area on each cross tube 3. The sample shown in Figure 1 has three cross tubes 3 although it will be appreciated that more or less may also be utilized.

15 Backpack cross straps 8 have each end fastened to one of lengthwise tubes 2 to also act as a frame reinforcement and shoulder straps 9 are fastened to cross tubes 3. Central between and connected to two of the cross tubes 3 is a structural member which provides a transmission support 4 best shown in Figure 2.

20 As illustrated in Figure 2, a transmission 5 is mounted to the top of support 4 and retained by carriage bolts 26 and locknuts 27. Transmission 5 contains a plurality of pulleys and/or gears and at least one belt which transmit rotational drive from engine drive shaft 6 to gear box 7 which converts the horizontal
25 rotation to vertical rotation out through cam shaft 31 best shown in Figure 3 through a reduction therein so as to provide the desired rotational speed as is commonly known.

30 In Figure 2 engine 10 is mounted onto one side of transmission 5 and water pump 11 in Figure 1 is mounted onto the other side of transmission 5 and has a water intake hose 12 and an outlet hose 13. A valve 18 is fitted onto outlet hose 13 for adjustment of the water flow. Flex hose 19 carries water from valve 18 to spray tube 60.

-10-

Cam **33** in Figure **3** is a short hollow round section of machined steel which has an offset-from-center round stub **30** extending upwards from its top and is attached by set screw **32** onto the top of cam shaft **31**. Ball bearing **28** is press fit onto round stub **30**. Cam cap **34** is preferably formed rubber which has a recess in its bottom surface to fit snugly over ball bearing **28**. Cam cap **34** also has an inwardly protruding ridge **29** at the opening of the recess to retain cam cap **34** on ball bearing **28** once pressed on.

Four flexible mounts **35** with threaded studs **36** and **38** protruding from the bottom and top of mounts **35** in Figure **1** and **5** are mounted on the top horizontal sections of two of cross tubes **3** with studs **36** extending down through holes **21** in cross tubes **3** and retained with lock nuts **27**.

Platform **39** in Figure **1** and **5** is formed with a hole **41** close to each corner. The four studs **38** of mounts **35** protrude up through holes **41** and lock nuts **27** and washers **37** fasten platform **39** to the tops of mounts **35**. Platform **39** has a formed pocket or hole **40** which snugly fits over cam cap **34** in Figure **2** and **3** thus when cam shaft **31** is spinning cam **33** vibrates bearing **28** and cam cap **34** which vibrates platform **39**. In Figure **5** platform **39** has a large central hole **44** sized to seat and horizontally retain gold pan **45** snugly.

Gold pan **45** best shown in Figure **4** is bowl shaped with a flat bottom **47** and a spillway **46** above the level of bottom **47** which extends out from the front side of pan **45** to keep the material being panned confined and allowed to flow out through spillway **46** only. The spillway **46** has a reduced height from the bottom **47** relative to the rim **43** theraround so as to direct removed water and material out of the gold pan **45** therethrough. In practice it has been found that a height of between $\frac{1}{2}$ and 1 inch (**13** and **25mm**) above the bottom **47** has been useful although it will be appreciated that other dimensions may be useful as well. The top edge of pan **45** is a circumferential rim **43** extending radially outwards. Bottom **47** has formed pockets or contours **42** designed to act as riffles to trap heavy particles.

-11-

Hinge bracket **50** in Figure **1** and Figure **5** is preferably a metal strip with its two ends **25** bent upward at a right angle to the bottom flat portion which is fastened to the front edge of platform **39** with bolts **26** and lock nuts **27**.
5 Vertical ends **25** of hinge bracket **50** each have a hole **51** large enough to act as a pivot sleeve around the outside circumference of each end of spray tube **60** allowing the ends of spray tube **60** to be positioned through holes **51** providing spray tube **60** and screen **57** to be pivotally retained in their position.

10 Screen **57** in Figure **1** is a formed pan shape with spillway **58** formed on the front side of it. Although the screen **57** is illustrated as shaped to correspond to the shape of the gold pan **45**, it will be appreciated that other shapes may be useful as well provided that the screen **57** is located thereover so as to be operable to prevent rocks and larger particles from being located in the gold
15 pan.

Spray tube **60** in Figure **5** and **6** has a lengthwise retaining slot **59** formed in its bottom section to retain screen **57** whereby the circumferential radially outward extending edge of screen **57** fits snugly in retaining slot **59** in Figure **6**
20 thus when spray tube **60** is installed and spray tube ends **49** fitted into holes **51** the screen is permanently held. Spray tube holes **61** are located around the inner face of spray tube **60** to spray water toward the center of screen **57**. Viewed from the front, **20**, the left end of spray tube **60** is fitted through hinge bracket hole **51** with a threaded end **49** protruding out and end cap **62**
25 threaded on in Figure **5**. End cap **62** can be removed for washing out debris in spray tube **60**. The right end of spray tube **60** in Figure **1** is fitted through hinge bracket pivot hole **51** with threaded end **49** of spray tube **60** protruding out and flex hose **19** threaded onto it. This allows spray tube **60** and screen **57** to be pivoted up while water is being sprayed in through spray tube **60**.
30 Therefore ends **49** of spray tube **60** also act as the hinge pins.

Adjustable screen support **63** in Figure **1**, **5**, and **7** is pivotally attached by support hinge **64** to the rear side of screen **57**. Support hinge **64** is fastened to

-12-

5 rear side of screen **57**. Screen support **63** is a formed piece of heavy wire extending down from the rear of screen **57**. Locking clamp **65** on carriage bolt **26** has wings extending over the wire of support **63** to press against the wire and lock it in place against support bracket **52** when threaded retaining knob **66** is tightened on outer end of carriage bolt **26**. Screen support **63** allows screen **57** to be pivoted up and locked at the desirable angle.

10 Gold pan **45** can be installed or removed when screen **57** is in a raised position. Install by sliding spillway **46** between vertical ends **25** of screen hinge bracket **50** where the two ends **49** of spray tube **60** hold spillway **46** down in the correct position, then push down on the back end of pan **45** until pan rim **43** locks down under the front edge of pan lock block **54**. To remove pan **45** press down on the outer top end of release lever **53**, this presses the mid-section of lever **53** against the top edge of screen support bracket **52** pushing the bottom end of lever **53** forward against pan **45** and kicking pan **45**'s rim **43** out of locking slot **56** at which time pan **45** pops upward and is released for removal by lifting pan **45** up and out to one side.

20 The operation of the machine will now be described. Set the machine in a roughly level position on the ground. Best shown in Figure **1** the end of the water intake hose **12** is submerged in water. Prime water pump **11** by filling the reservoir with water. Start engine **10**. This drives water pump **11** sending water to spray tube **60** and through holes **61** and rotates cam shaft **31** to vibrate platform **39**, gold pan **45**, and screen **57**. Loosen screen support clamp knob **66** and tilt up screen **57** to the desired angle and retighten knob **66**. Gold bearing material can now be shovelled onto the top portion of screen **57**. Material smaller than screen **57** hole size will fall through into gold pan **45** and anything larger will gradually roll out and off screen spillway **58**. As material is continuously shovelled onto screen **57** gold pan **45** will be filled with the smaller gold bearing material and water up to the level of pan spillway **46**. The vibration of gold pan **45** will settle the heaviest particles to the bottom of pan **45** while the lightest material will circulate at the top and gradually fall out through pan spillway **46**. Continue to shovel material onto screen **57** for

-13-

any length of time and the heavy metals and stones will continue to accumulate in the bottom of gold pan **45**. When finishing, press lever **53** to release gold pan **45** which can then be lifted out and final panning out of remaining material done by hand to reduce it down to the heaviest metals and stones at the bottom.

5

In an alternate embodiment of the machine shown in Figure **8**, an electric motor **69**, electric water pump **70** and battery **68** replaces engine **10**, water pump **11** and transmission **5**. A switch and rheostat **67** is mounted on the machine to control the vibration and pump speed.

10

In a second alternate embodiment of the machine shown in Figure **9**, horizontal transmission **77** can be substituted for transmission **5** and gearbox **7** wherein engine **10** is mounted with its shaft extending vertically downward into transmission case **77** to drive a plurality of pulleys and belts which drive water pump **78** and cam shaft **31**.

15

In a third alternate embodiment of the machine shown in Figure **10**, turbine **75** can be substituted for transmission **5** and gearbox **7**. Pipe **76** directs water from tee **73** to valve **18** for adjustment of the water flow. Flexible hose **19** carries water from valve **18** to spray tube **60**. Hose **74** carries water from the other outlet of tee **73** to turbine **75**. Turbine **75** is similar in operation to a Pelton Wheel having spoons which catch the force of a water spray to create rotational movement through camshaft **31**. Cam shaft **31** in Figure **3** extends upward from turbine **75**.

20

25

It will be appreciated that the vibration of the platform, pan and screen could be produced with an unbalanced spinning wheel instead of a cam. It will be further appreciated that this machine may be used for dry panning in desert areas where a water pump and spray tube would not be needed. It will be further appreciated that this machine is described as being used for isolation of gold, but it may be used just as well for isolation of any other precious metals or stones such as platinum, diamonds etc.

30

5 While specific embodiments of the invention have been described and illustrated, such embodiments should be considered illustrative of the invention only and not as limiting the invention as construed in accordance with the accompanying claims.

CLAIMS

1. Apparatus for separating heavy metals and precious stones from alluvial material comprising:
 - a frame;
 - a receptacle having a bottom that is substantially level and even with regard to a horizontal plane and a side wall extending around said bottom for receiving a quantity of alluvial material in said receptacle;
 - a spillway in a portion of said side wall, said spillway being spaced above the substantially level and even bottom of the receptacle, the spillway defining a base portion of the receptacle below the spillway, said spillway allowing excess alluvial material to exit the receptacle when the material in the receptacle exceeds a volume defined in said base portion below the spillway;
 - said receptacle being supported on said frame by flexible mounts allowing vibratory movement of said receptacle in relation to said frame;
 - vibration means supported on said frame and adapted to provide vibration to said receptacle; and,wherein when alluvial material is successively received in said receptacle, said vibratory movement causes a heavier portion of the alluvial material to be retained in said base portion of said receptacle and a lighter portion of the alluvial material to be displaced upward within said base portion of the receptacle and to be pushed out of the receptacle through said spillway.
2. The apparatus of claim 1 further comprising a water pump supported on said frame operable to introduce a quantity of water to said receptacle from a water source.

3. The apparatus of claim 2 further comprising a spray tube above said receptacle in fluidic communication with said water pump, said spray tube having outlets positioned to discharge water onto said receptacle.
4. The apparatus of claim 3 further comprising a screen supported by said spray tube wherein said spray tube is formed with a lengthwise inward facing channel below said outlets adapted to retain an edge of said screen.
5. The apparatus of claim 4 wherein said spray tube extends from distally opposed and oriented ends extending away from each other so as to provide a hinge for tilting said spray tube and screen.
6. The apparatus of claim 3 wherein said spray tube is semicircular in length and having a shape corresponding to an outline of said receptacle.
7. The apparatus of claim 1 further comprising a plurality of flexible mounts fastened to said frame for flexibly supporting said receptacle.
8. The apparatus of claim 7 further comprising a platform supported by said flexible mounts having a central hole sized to receive said receptacle therein.
9. The apparatus of claim 8 wherein said vibration means comprises a rotating cam having an eccentrically located protrusion engaged with a bearing connected to said platform.
10. The apparatus of claim 1 wherein said side wall extends upward at an outward angle from said bottom.
11. The apparatus of claim 10 wherein said bottom includes contours formed thereinto proximate to said spillway.

12. The apparatus of claim 10 wherein said spillway has a horizontal bottom and sidewalls extending upwards therefrom, with an opening allowing lighter material to flow out of said receptacle.
13. The apparatus of claim 1 wherein said frame comprises a plurality of base members and cross members wherein said receptacle is supported thereabove, said frame further comprising shoulder straps extending from said base members so as to permit said frame to be carried on the back of a user.
14. The apparatus of claim 13 wherein said platform includes a lock for selectably securing said receptacle in said central hole.
15. A method of separating heavy metals and precious stones from alluvial material comprising:
 - providing an apparatus having
 - a frame;
 - a receptacle flexibly supported on said frame for vibratory movement of said receptacle in relation to said frame;
 - vibration means supported on said frame and adapted to provide vibration to said receptacle;
 - said receptacle having a bottom that is substantially level and even with regard to a horizontal plane and a side wall extending around said bottom for receiving a quantity of alluvial material in said receptacle; and,
 - a spillway extending through a portion of said side wall, said spillway spaced above said bottom to define a base portion of said receptacle to retain a volume of alluvial material in said base portion below said spillway;

installing said apparatus in the vicinity of alluvial material such that said bottom of said receptacle is substantially horizontally level;

introducing a quantity of alluvial material in said receptacle while causing said receptacle to vibrate in relation to said frame, said bottom remaining substantially horizontally level;

introducing a successive quantity of alluvial material in said receptacle while continuing to cause said receptacle to vibrate;

whereby said vibration causes a heavier portion of said alluvial material to settle in said base portion below said spillway and a lighter portion of said alluvial material to be displaced upward and out of the receptacle through said spillway.

16. The method of claim 15 further comprising introducing water into said receptacle when introducing said successive quantity of alluvial material.
17. The method of claim 16 wherein introducing water comprises spraying water.
18. The apparatus of claim 1 wherein said bottom of said receptacle is substantially circular.
19. The apparatus of claim 2 wherein said bottom of said receptacle is substantially circular.

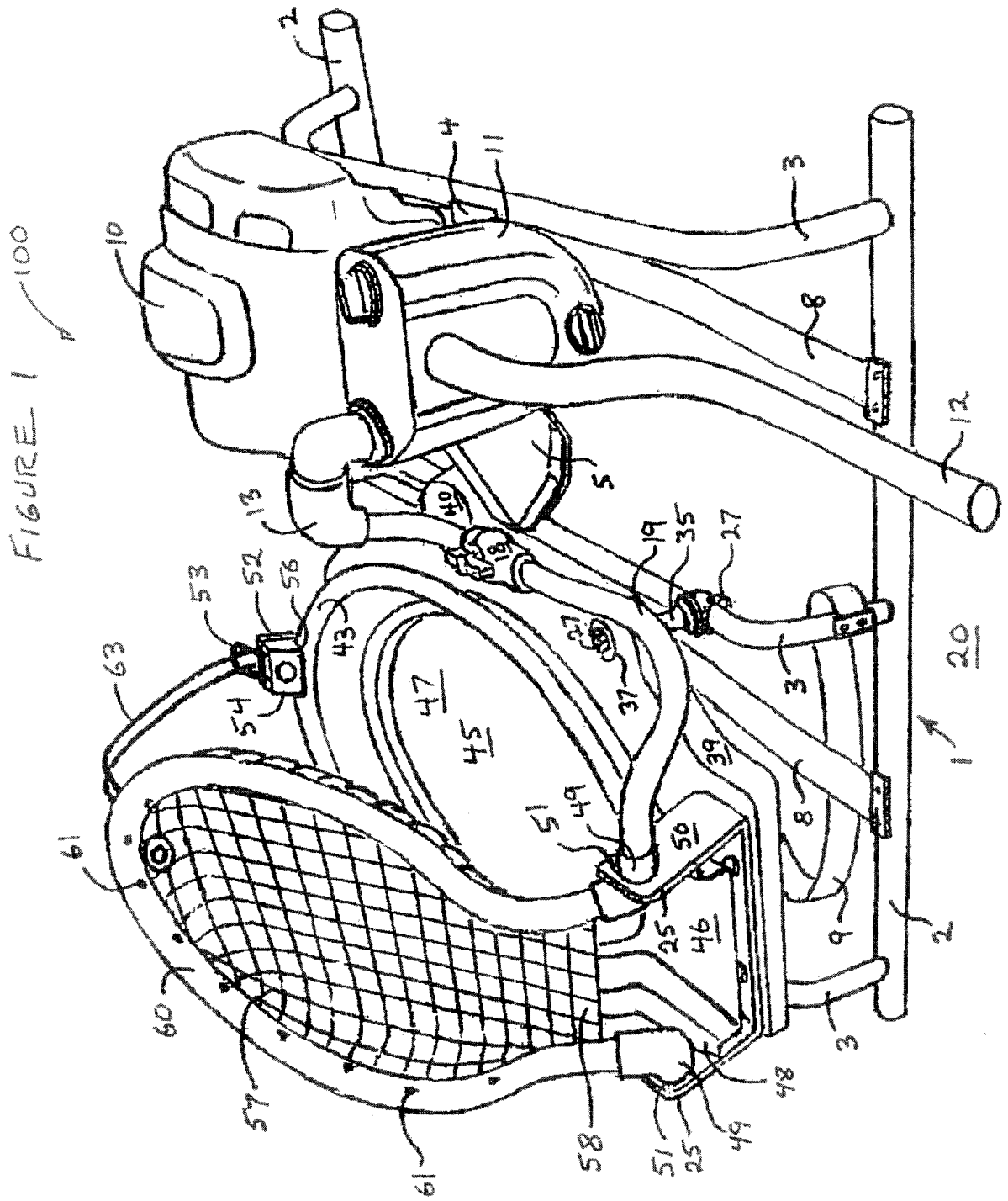
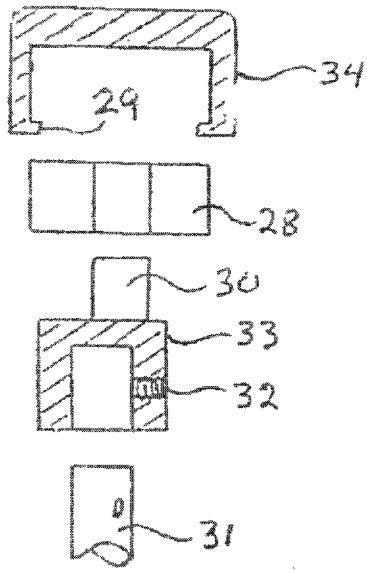


FIGURE 3



2/6

FIGURE 2

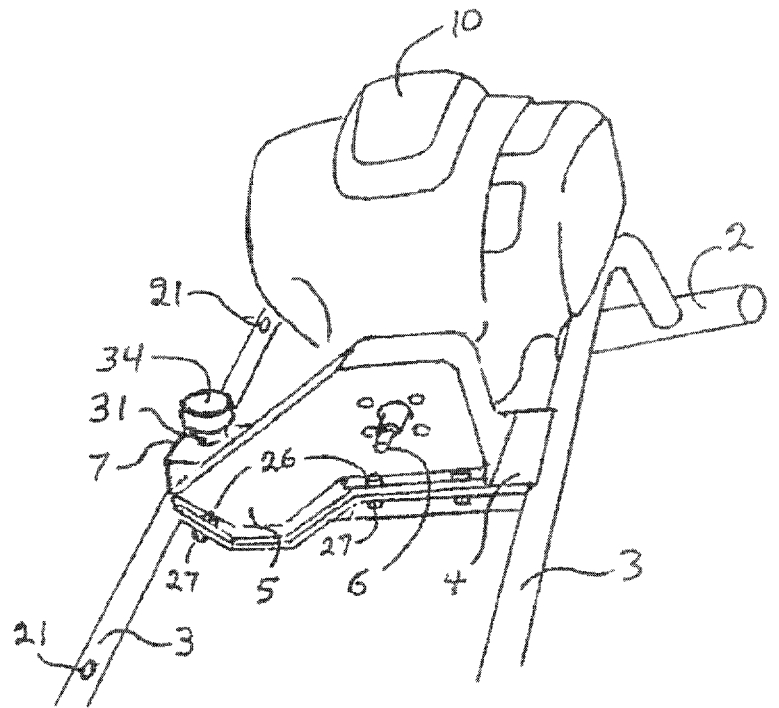


FIGURE 4

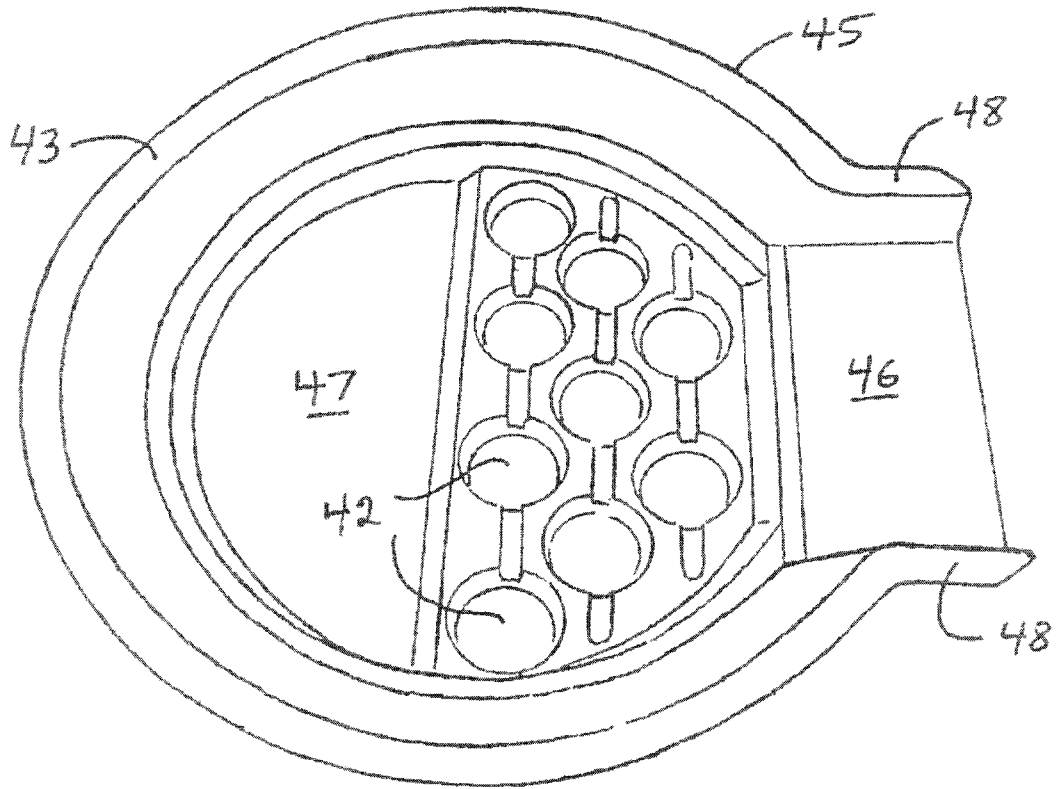


FIGURE 5

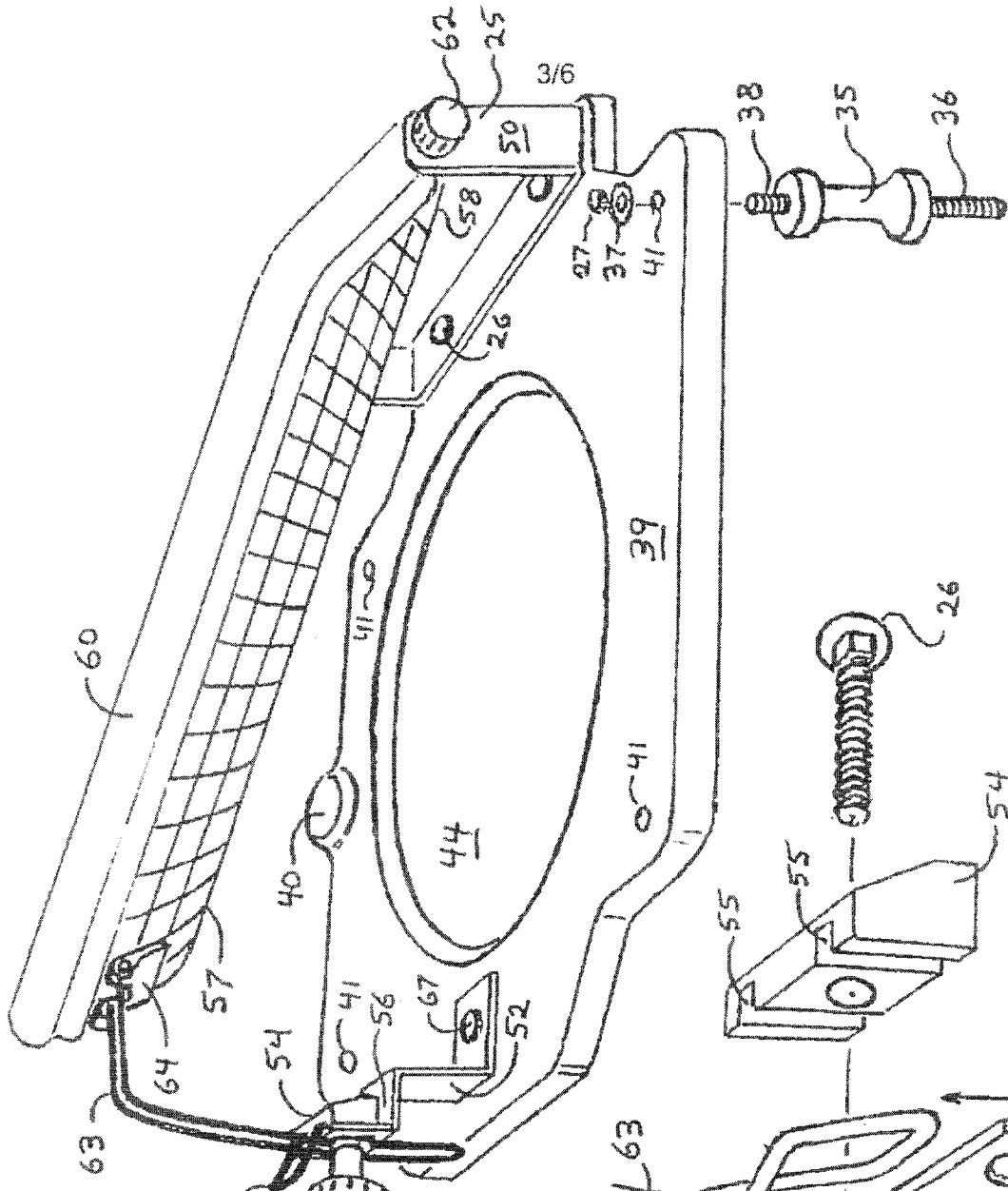


FIGURE 7

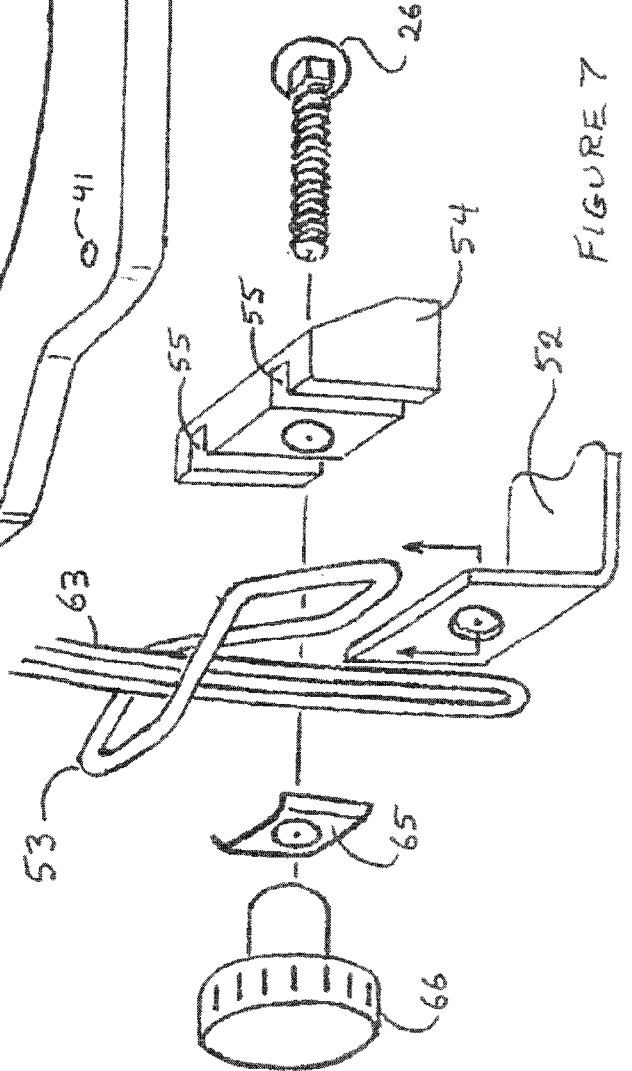


FIGURE 6

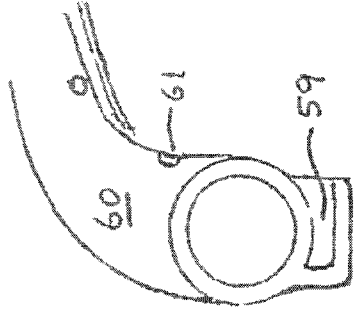


FIGURE 8

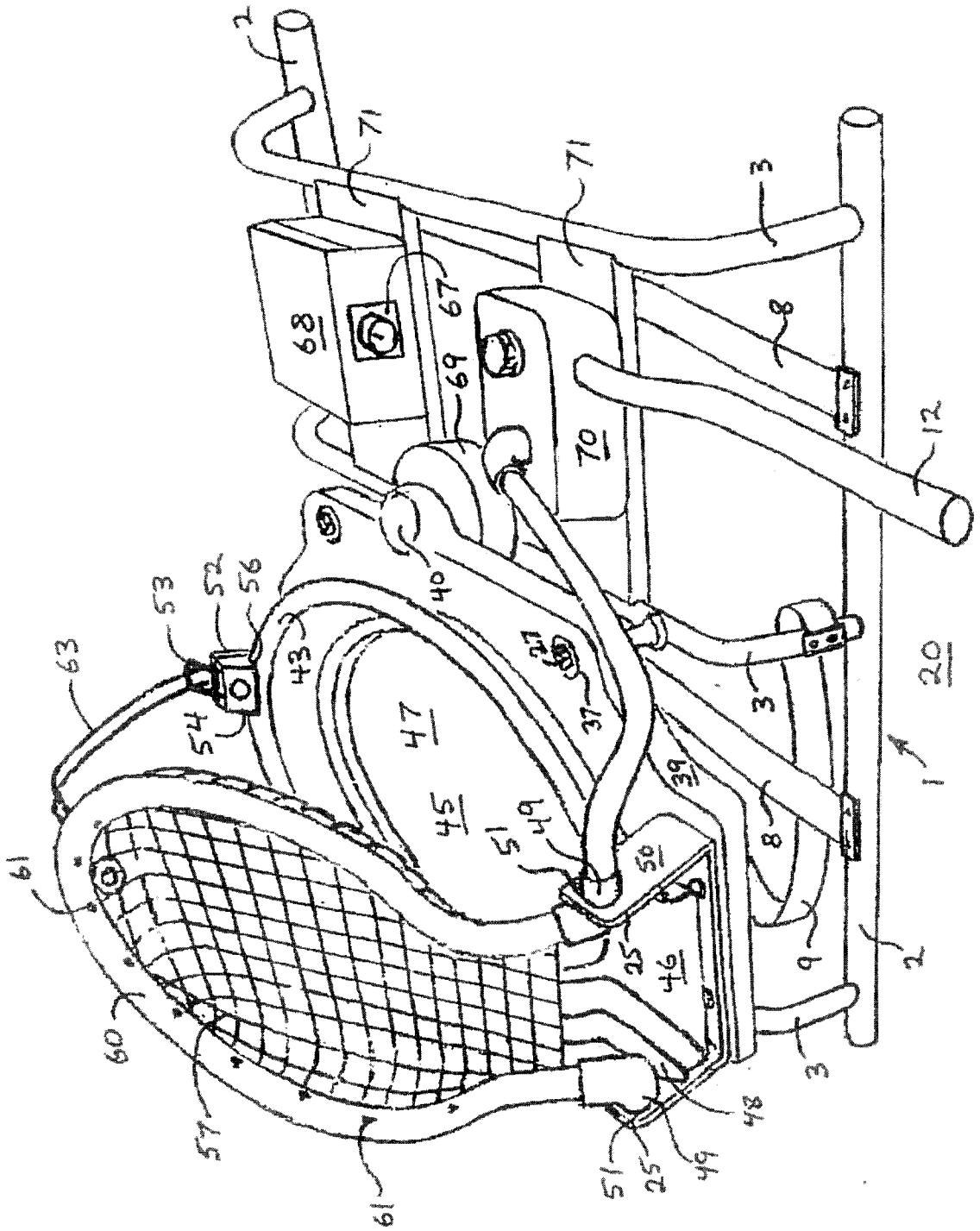


FIGURE 9

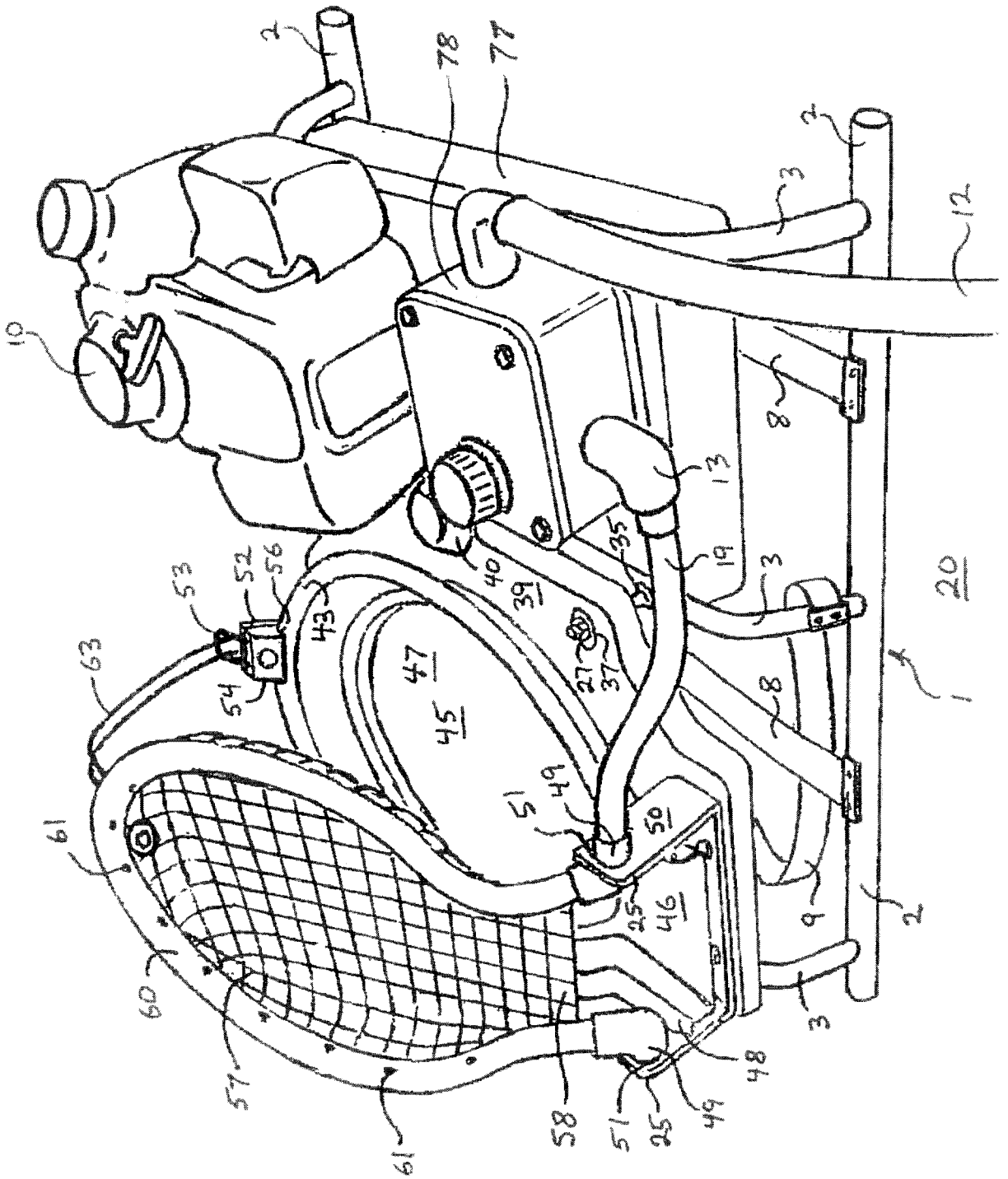


FIGURE 10

