Sept. 1, 1970 W. A. ERICKSON 3,526,318

MOBILE SYSTEM FOR SEPARATING SOLIDS

Filed Dec. 23, 1969 4 Sheets-Sheet 1

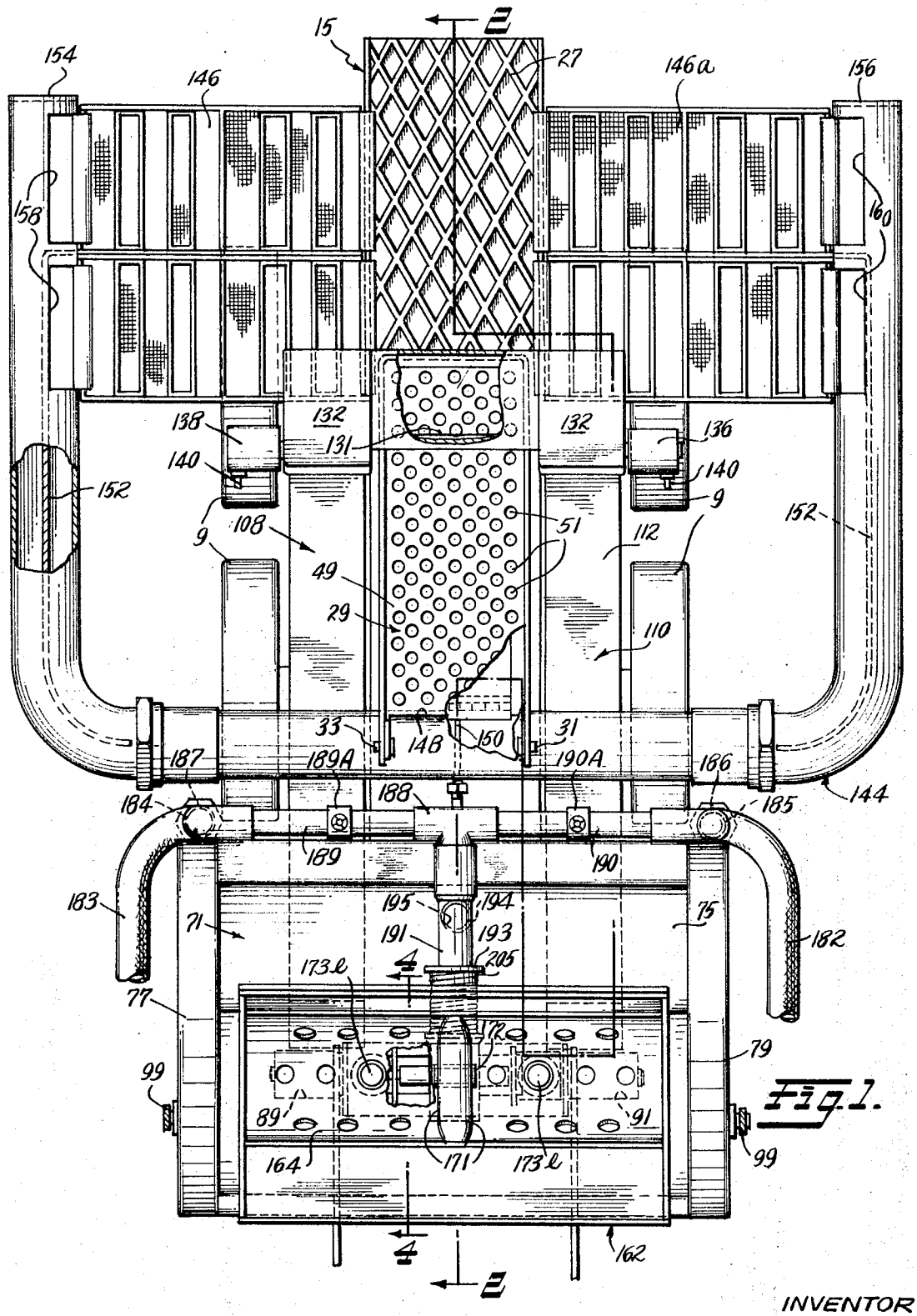


Fig. 1.

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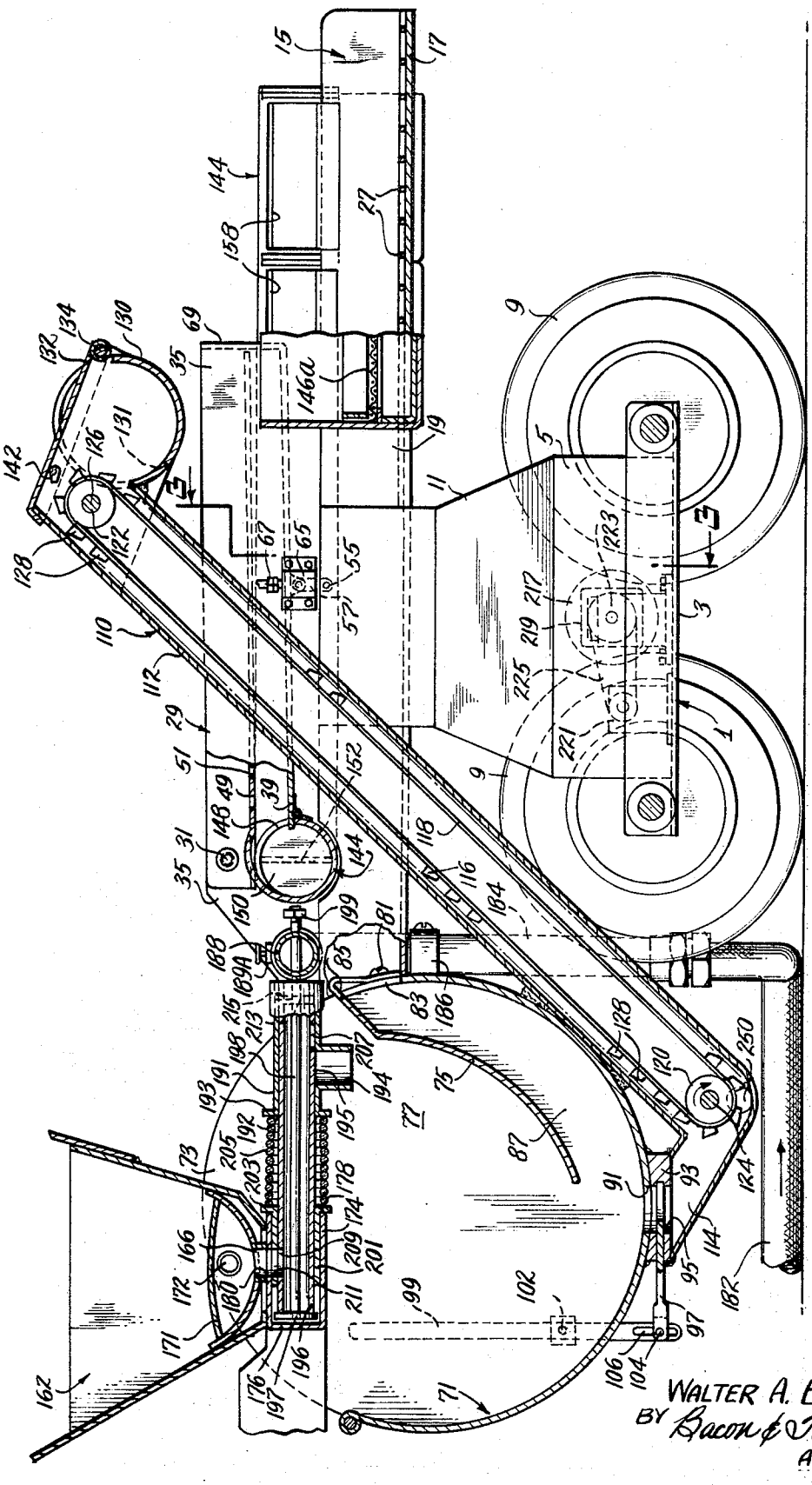


FIG. 2.

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MOBILE SYSTEM FOR SEPARATING SOLIDS

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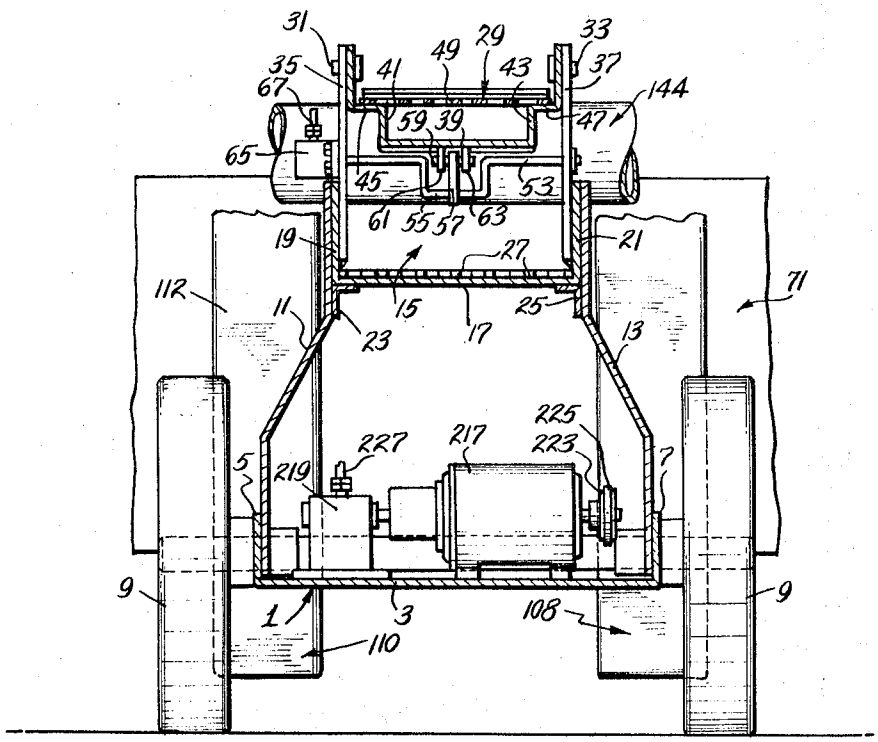


Fig. 3.

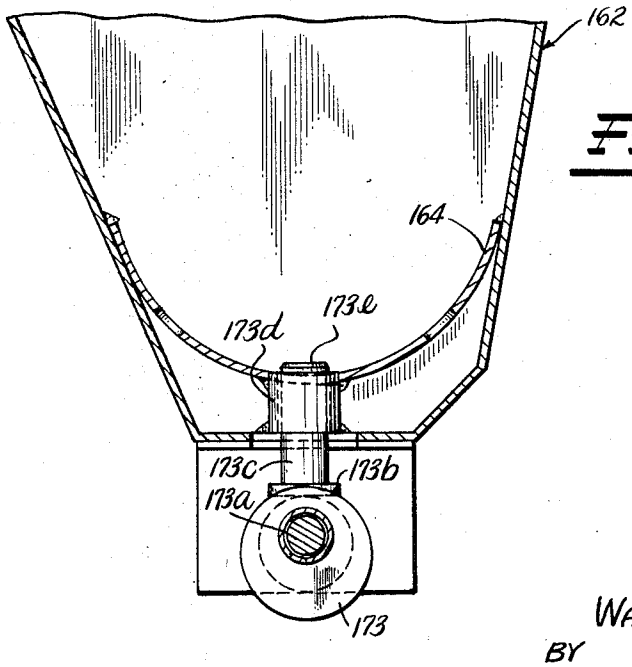


Fig. 4.

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MOBILE SYSTEM FOR SEPARATING SOLIDS

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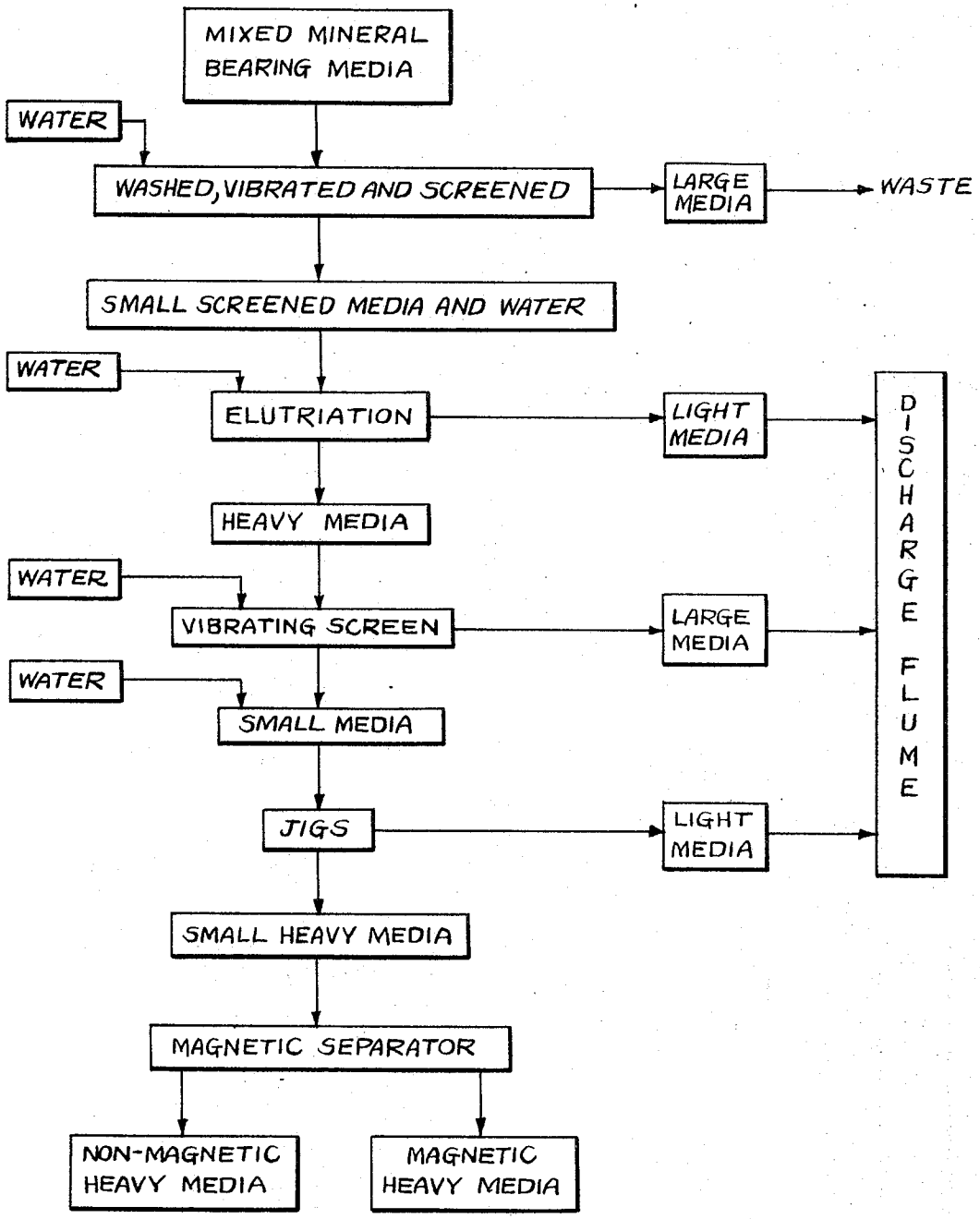


Fig. 5.

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3,526,318

MOBILE SYSTEM FOR SEPARATING SOLIDS

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Int. Cl. B03b 7/00
U.S. Cl. 209—13 13 Claims

ABSTRACT OF THE DISCLOSURE

Mobile apparatus for separating solids comprising a loader bucket in which the ore is washed and very large particles removed, a receptacle wherein the ore is flushed with water removing some of the lighter particles, a screen wherein the ore is further sized, a jig wherein the final separation of heavy values occurs, and a riffled flume onto which the wastes from the receptacle, the screen, and the jig are discharged.

The invention relates to the recovery of heavy ores and valuable heavy metals from mixed media such as crushed ore, tailings resulting from previous separating operations, mineral bearing media obtained by strip mining, and other media containing heavy mineral values. The mixed media is subjected to a number of different types of classifying and separating operations in a portable or mobile apparatus for rapidly and efficiently separating and recovering the small, heavy, mineral values from large quantities of mixed mineral bearing material.

Although it is well known to provide various apparatus for processing ores, the present combination and arrangement of mobile processing apparatus is believed to be novel and provides advantages not found in known apparatus.

It is an object of this invention to provide a mobile apparatus for thoroughly and rapidly processing large quantities of mineral bearing media and recovering the small heavy ends therefrom;

Another object of the invention is to provide apparatus for separating heavy media from light media by controlling the suspension and separation of the media in a water filled receptacle;

A further object is to provide a method for rapidly and thoroughly separating and recovering desirable heavy media from mixed mineral bearing material;

An additional object is to provide a process and apparatus for subjecting mineral bearing media to a number of different separating and classifying steps and devices for efficiently separating and recovering therefrom the small, heavy mineral values.

Additional objects and advantages of the invention will become apparent from the following detailed description considered in conjunction with the drawings in which:

FIG. 1 is a top plan view, partly broken away, of the mobile apparatus;

FIG. 2 is a view of the apparatus, partly in section, taken on line 2—2 of FIG. 1;

FIG. 3 is a sectional view of the apparatus taken on the line 3—3 of FIG. 2;

FIG. 4 is an enlarged sectional view of the loader bucket taken on the line 4—4 of FIG. 1; and

FIG. 5 is a flow diagram showing the steps in the treatment of the mineral bearing media as it is processed during its passage through the apparatus.

The apparatus as shown in the drawings, includes a support frame 1 having a heavy bottom wall 3 and vertical side walls 5 and 7. The upper portion of the support frame 1 is formed by the plates 11 and 13 which are secured to the inner surface of the walls 5 and 7, respectively and converge inwardly and upwardly at the intermediate portions thereof. The support frame 1 is mounted on a pair of ground engaging wheels 9 disposed at either side of the apparatus.

A discharge flume 15 having a bottom wall 17 and side walls 19 and 21 is mounted in a gently inclined position between the upper ends of the plates 11 and 13 and rests on the angle irons 23 and 25 fixedly secured to the inner surface of the plates 11 and 13. The discharge flume 15 is provided with riffles 27 of any suitable type extending from one end to the other end thereof.

A vibrating screen 29 is positioned above the discharge flume 15 and is pivotally mounted at one end thereof on pivot pins 31 and 33 carried adjacent the upper end of the members 35 and 37 rigidly fixed to the inner surface of the side walls 19 and 21 of the discharge flume.

The vibrating screen 29 includes an imperforate bottom wall 39 and side walls 41 and 43 extending upwardly therefrom. The side walls 41 and 43 are formed with shoulder portions 45 and 47 upon which rests an open mesh screen 49 having openings 51 of a suitable size formed therein.

The screen 29 is supported at approximately the midpoint thereof by a rotatable shaft 53 mounted in suitable aligned openings in the members 35 and 37. The center portion of the shaft 53 is formed with an eccentric crank portion 55 and a link 57 connects the eccentric crank 55 with the lower surface of the bottom wall 39 of the vibrating screen 29 by means of a pivot pin 59 carried between the lugs 61 and 63 which are rigid with the lower surface of the bottom wall 39. The end of the shaft 53 which extends through the member 35 is drivingly connected with a variable speed motor 65 of conventional conception. The motor 65 may be hydraulic or electric and is connected with a source of power for driving it.

As clearly shown in FIG. 2 of the drawings, the vibrating screen is inclined with respect to the horizontal and the discharge end thereof, which is adjacent the pivot pins 31 and 33, is at a slightly lower elevation than the inlet end of the screen. The end of the vibrating screen 29 opposite the pivoted end is closed by an end wall 69 which extends between the side walls 41 and 43. Material which is too large to pass through the openings 51 will be discharged from the end of the perforated screen adjacent the pivots 31 and 33 and material which passes through the openings 51 in the screen 49 and drops to the bottom wall 39 will also be discharged from the end of the screen where it is pivoted at 31 and 33.

A receptacle 71 for materials to be processed is rigidly secured to the inlet end of the discharge flume 15 and to the adjacent ends of the members 35 and 37. As shown for the purpose of illustration, the receptacle 71 is of drum-like configuration and is provided with a large top opening 73 for receiving mixed mineral material. A baffle 75 which extends between the ends 77 and 79 of the receptacle is of generally V-shape at its upper edge where it extends through the opening 73 and is secured to the outer surface of the receptacle 71 by threaded fasteners 81 or by any other suitable means.

The receptacle 71 is provided in the upper portion of the side wall thereof with a discharge opening 83 positioned in alignment with the inlet end of the discharge flume 15. The portion of the baffle 75 which extends over the outer surface of the receptacle 71 is notched as at 85 so that relatively light media may pass from the lower portion of the receptacle 71 upwardly through the discharge passage 87 provided by the space between the baffle 75 and the adjacent wall of the receptacle 71 and out through the opening 83 and notch 85 into the discharge flume 15. It will be noted that the baffle 75 is spaced from the wall of the receptacle 71 to provide a suitable discharge passage 87, and that the baffle 75 is

substantially parallel with the adjacent wall of the receptacle **71** with the lower end of the baffle **75** terminating adjacent to but spaced above the bottom wall of the receptacle.

The heavy media which settles to the bottom of the receptacle **71** is discharged from the receptacle through a pair of openings **89** and **91** formed in the bottom wall of the receptacle adjacent the opposite ends thereof. Flanges **93** having openings **95** formed therein in alignment with the openings **89** and **91** are fixedly secured to the outer surface of the receptacle **71**. The discharge of heavy media from the bottom of the receptacle **71** through the openings **89** and **91** is controlled by a pair of reciprocating valve plates **97** each of which is moved between the open and closed position by a manually operated lever **99** pivoted adjacent its lower end as at **102** to the adjacent end of the receptacle **71** and connected to the outer end of the respective valve plate **97** by a pin **104** carried by the valve plate, the pin being engaged in an elongated slot **106** formed in the lower end of the lever **99**.

The heavy media which collects in the bottom of the receptacle **71** is transferred through the openings **89** and **91** to the inlet end of the vibrating screen **29** by a pair of conveyors **108** and **110** located on either side of the discharge flume **15**. Since the conveyors **108** and **110** are of the same construction and operate in the same manner, only one of them will be described in detail.

The conveyor **110** as best illustrated in FIG. 2, includes an elongated, inclined housing **112** having an inlet passage way **114** connected to the flange **93**. The conveyor housing is welded or otherwise fixedly secured to the outer surface of the receptacle **71** and further supported in fixed position by connections, not shown, with the adjacent side wall of the discharge flume **15** and the member **35**.

Mounted within the conveyor housing **112** is an endless conveyor **116** which may be of any suitable conventional construction. As shown, the endless conveyor **116** includes a chain or belt **118** passing over the pulleys **120** and **122** carried by the shafts **124** and **126** rotatably mounted in the side walls of the housing **112**. A plurality of buckets **128** secured to the endless conveyor **116** convey heavy media received from the bottom of the receptacle **71** through the inlet passage **114** to the upper discharge end of the conveyor **110** where the heavy media is discharged into a transversely extending trough **130**. The trough **130** connects the upper ends of the conveyor housings together and has an open side **131** disposed above the inlet end of the vibrating screen **29**. The upper end of the conveyor housings are closed by a cover **132** pivoted on a hinge **134** carried by the upper edge of the transverse trough **130**.

A conventional variable speed fluid, hydraulic or electric motor **136** fixed to the outer surface of the conveyor **110** is operably connected with the shaft **126** for driving the endless conveyor **116** and a similar motor **138** is mounted in like manner on the conveyor **108** for driving the endless conveyor associated therewith. The motors **136** and **138** are operably connected with a source of power for operating them.

In order to remove the heavy media from the buckets **128** at the upper end of the flights, and to assist in transferring the heavy media from the endless conveyors to the vibrating screen, a water spray header **142** is mounted in the upper end of each of the endless conveyors and the water spray headers are provided with fittings for connecting them to a source of water under pressure.

The small heavy media which passes through the openings **51** in the vibrating screen **49** is delivered through a U-shaped conduit **144** to a pair of placer jigs **146** and **146***a* disposed on either side of the discharge flume **15** adjacent the outlet end thereof. As shown in the drawings, the U-shaped conduit **144** has a rectangular shaped inlet opening **148** formed in the transverse portion thereof and the small screened media from the vibrating

screen **29** enters the conduit **144** through the opening **148** and is divided into substantially equal parts by a vertically extending divider **150** which extends transversely across the conduit **144** at approximately midpoint of the opening **148**. Thus one-half of the fine material passing through the vibrating screen will be delivered to the jigs **146** and the other half to the jigs **146***a*. Each leg of the conduit **144** is provided with a longitudinally extending partition or splitter **152** which divides the flow of small heavy media directed to each leg of the conduit **144** into substantially two equal parts. The outer ends of the conduit **144** are closed by walls **154** and **156** and a pair of outlet openings **158** and **160** are formed in the inner walls of the conduit **144** adjacent the extremities of the legs thereof. The inlets to the jigs **146** communicate with the outlet openings **158** while the inlets to the jigs **146***a* communicate with the outlet openings **160**. The partitions **152** extend longitudinally of the conduit **144** from a point between the outlet openings **158** and **160** to a point within the outer ends of the transverse portion of the conduit.

The large material discharged onto the vibrating screen **29** which does not pass through the openings **51** in the screen **49** passes from the discharge end of the vibrating screen over the upper surface of the U-shaped conduit **144** and falls onto the discharge flume **15** adjacent the inlet end thereof. The flow of water from the water spray headers **142** at the upper ends of the conveyors may be sufficient for washing the material on the vibrating screen **29** and for delivering the relatively small heavy media which passes through the openings **51** in the screen **49** through the U-shaped conduit and into the placer jigs **146** and **146***a*. In the event that additional water is required for this purpose, a hose or other suitable water outlet may be positioned above the vibrating screen **29** to furnish any additional water which may be required.

The placer jigs **146** and **146***a* are designed and constructed so that the lighter portion of the relatively small heavy media supplied thereto will be discharged therefrom to the discharge flume **15** while the heavier portion of the small relatively heavy media passes to the bottom of the jigs where it may be withdrawn. Suitable placer jigs of the type described are manufactured, for example, by the Dorr-Oliver Company of Stamford, Conn. as the Dorrco Pan-American Placer Jig. These jigs may be actuated by hydraulic motors or by electric motors. The small heavy media withdrawn from the bottom of the jigs is referred to as "heavy ends" and contains mineral values which are non-magnetic as well as those which are magnetic. In order to separate the non-magnetic from the magnetic values, the heavy ends are passed through conventional magnetic separating means where the magnetic heavy ends are separated from the non-magnetic heavy ends and the separated heavy ends are recovered.

Mixed media containing mineral values may be carried to the receptacle **71** and deposited therein by means of a materials separating loader bucket as shown in Pat. 3,395,798 but preferably by means of the improved loader bucket **162** illustrated in the drawings. While the loader bucket **162** shown in this application is similar in many respects to the structure and method of operation of the one shown in Pat. 3,395,798, the present loader bucket differs from the one disclosed in the patent in a number of novel respects.

In the loader bucket **162**, the screen **164** positioned adjacent to but spaced above the bottom wall of the bucket is fixedly secured as by welding to the front and back walls of the bucket. As best shown in FIG. 2, the water for washing the materials in the bucket is supplied through an opening **166** formed in the bottom of the bucket midway between the opposite side walls thereof. A chamber is formed above the opening **166** in the bottom portion of the bucket **162** by the adjacent imperforate portion of the screen **164**, a pair of parallel, vertical side walls **170** and a top wall **171**. A short piece of pipe **172**

is mounted in each of the side walls **170** for discharging water in opposite directions into the interior of the bucket from the chamber **168**.

The bucket is vibrated as the media therein is being washed by water and screened. A cam **173** mounted on the shaft **173***a* rotated by a suitable variable speed hydraulic or electric motor mounted on the loader bucket **162**, engages the head **173***b* of a solid metal piston **173***c*. The piston **173***c* slides freely in a vertical opening formed in the bushing **173***d* welded in the bucket and the upper end **173***e* of the piston extends into the bucket for a short distance for striking against media contained therein thereby vibrating the bucket and its contents.

Fixedly secured to the lower surface of the bottom wall of the loader bucket **162** and extending transversely thereof is a cylindrical, cupped shaped member **174** having an end wall **176** at one end thereof and an opening **178** at the other end thereof. The cylindrical member **174** is provided with an opening **180** for alignment with the opening **166** formed in the bottom wall of the loader bucket **162**.

Water under pressure is supplied to the apparatus through flexible hoses **182** and **183** located at either end of the receptacle **71**, from a source of pressure, not shown. Vertical pipes **184** and **185** fastened to the outer surface of the receptacle **71** adjacent the opposite ends thereof by suitable clamps **186** and **187** are connected at their lower end to the respective flexible hoses **182** and **183**. The upper ends of the vertical pipes **184** and **185** are connected together by a T-fitting **188** and the short conduits **189** and **190**. The valves **189A** and **190A** control the flow of water through the conduits **189** and **190** respectively. A horizontally extending outlet pipe **191** extends from the T-fitting **188** outwardly over the receptacle **71** and terminates in an opening **192** surrounded by an outwardly extending annular flange **193**. The outlet pipe **191** is provided adjacent the flange **193** with a short downwardly extending outlet branch **194** which provides a passage **195** for the water under pressure to be discharged into the receptacle **71** and against the surface of the baffle **75**.

The water supplied under pressure to the flexible hoses **182** and **183** may be discharged through duct means either into the receptacle through the outlet branch **194** or into the loader bucket **162** through the opening **166**. One end of a tubular sleeve **196** has a close sliding fit within the outlet pipe **191** and the other end extends outwardly a substantial distance beyond the flange **193** of the outlet pipe **191**. The outer free end of the tubular sleeve **196** is closed by a plug or cap **197** which is fixed thereon and which extends radially outward for a short distance beyond the outer periphery of the sleeve. A rod **198** fixed at one end to the center of the cap **197** extends lengthwise through the center of the tubular sleeve **196** and with a snug sliding fit through an opening formed in the T-fitting **188**. A nut **199** fastened to the other end of the rod **198** is adapted to abut against the outer surface of the T-fitting **188** and thus limit outward sliding movement of the tubular sleeve **196** in the outlet pipe **191**.

Slidably mounted on the other end of the tubular sleeve **196** is a cylindrical fitting **201** provided with a radially outwardly extending flange **203** at one end thereof, the other end of the cylindrical fitting abutting against the cap **197** for limiting the outward sliding movement of the fitting **201** on the tubular sleeve **196**. A coiled compression spring **205** surrounds the tubular sleeve **196** and is confined under compression between the flanges **193** and **203**, thus resiliently urging the cylindrical fitting **201** against the cap **197** and the nut **199** against the outer surface of the T-fitting **188**. In this extended position of the tubular sleeve **196**, an outlet opening **207** formed in the tubular sleeve **196** is in alignment with the passage **195** of the outlet branch **194**.

The inner diameter of the cylindrical cup-shaped member **174** is such that the member **174** may slide freely over the cylindrical fitting **201** and the cap **197** to the position shown in FIG. 2. The radial wall of the open end of the cylindrical member **174** is adapted to engage the flange **203** of the cylindrical fitting **201** and to slide the cylindrical fitting **201** on the tubular sleeve **196** a short distance to the right compressing the coiled spring **205** until the end wall **176** of the member **174** abuts against the cap **197**. In this position, an outlet opening **209** formed in the tubular sleeve **196** and an outlet opening **211** formed in the cylindrical fitting **201** will be in alignment with the opening **180** of the cylindrical cup-shaped member **174** and with the opening **166** formed in the bottom wall of the loader bucket **162**. Further movement of the cylindrical member **174** to the right as viewed in FIG. 2 will result in sliding the tubular sleeve **196** to the right moving the outlet opening **207** into the cylindrical portion of the outlet pipe so that it is out of fluid communication with the passage **195** of the outlet branch **194**. Inward movement of the tubular sleeve **196** is limited by a stop ring **213** fixed within the outlet pipe **191** and rotation of the tubular sleeve **196** is prevented by forming a transverse groove in the stop ring **213** and providing on the end of the tubular sleeve **196** a finger **215** slidably engaged in the said transverse groove. When the tubular sleeve **196** is moved to the right to the position shown in FIG. 2, the nut **199** on the end of the rod **198** is moved away from the outer surface of the T-fitting **188**.

In order to provide power for operating the apparatus, an electric motor or an internal combustion engine **217** is shown mounted on the bottom wall **3** of the support frame **1** and is operably connected with a positive displacement hydraulic pump **219**. The motor **217** may also drive an electric current generator **221**, for example, by means of a pulley **223** carried by the motor and a suitable belt **225** drivingly connecting the motor and generator, or in any other suitable manner.

The hydraulic pump **219** may be connected by suitable supply and return pressure lines with the motors **136** and **138** when hydraulic motors are employed to drive the conveyors **108** and **110**. Suitable valve controls are connected with the pressure lines to the motors **136** and **138** for regulating the flow of hydraulic fluid to these motors and thus regulating the speed of the motors and of the conveyors driven thereby. Pressure lines are also connected between the pump **219** and the motor **65** when a hydraulic motor is provided for rotating the shaft **53** and thus vibrating the screen **29**. The speed of rotation of the motor **65** and thus the rate of vibration of the screen **29** is suitably controlled by providing regulating valve means in the hydraulic supply line connecting the pump **219** and the motor **65**. Suitable hydraulic motors are those of the rotary, expansible chamber type having interengaging impellers produced, for example, by Char-Lynn of Eden Prairie, Minn. 55343.

Should the motors **136**, **138** and **65** be electric, suitable supply lines and speed control means would be provided to connect the motors with the electric generator **221** or with an independent source of electric current, not shown.

In operation, the apparatus is moved to a suitable location near the materials to be processed and the mixed media containing heavy mineral values is loaded into the loader bucket **162** and is carried thereby to the receptacle **71**. The cylindrical member **174** is telescoped over the cylindrical fitting **201** compressing the spring **205** and bringing the openings **180**, **211** and **209** into alignment for discharging water into the interior of the materials loader bucket **162** and for moving the opening **207** out of communication with the passage **195** stopping the flow of water directly into the receptacle. As the water is discharging into the bucket **162**, the bucket and the media contained therein will be vibrated by rotating the cam **173** and driving piston **173***c* rapidly against the rocky material in order to rapidly and thoroughly remove all of the small media from the large media resting on the screen. After the small mixed media in the bucket has

been separated from the large mixed media and the small mixed media has passed through the screen **164** and openings provided in the bottom wall of the bucket and has been discharged into the receptacle **71**, the bucket **162** is withdrawn permitting the compression spring **205** to move the cylindrical fitting **201** to the left as viewed in FIG. 2 thereby closing the outlet **209**. As the end of the cylindrical fitting **201** engages the cap **197**, the spring **205** moves the tubular sleeve **196** to the left until the nut **199** engages the outer surface of the T-fitting **188** thereby bringing the sleeve outlet opening **207** into alignment with the passage **195** of the outlet branch **194** so that the water under pressure being supplied through the flexible hoses **182** and **183** will be discharged into the receptacle.

The separation of the relatively heavy media from the relatively light media in the receptacle **71** by controlling the rate of flow of the water through the receptacle is an important aspect of this invention. The rate of flow of water into the receptacle **71** through the passage **195** is controlled by the valves **189A** and **190A** in such a manner that the media discharged into the receptacle will be thoroughly washed and agitated in the lower portion thereof and the relatively light media, that is media having a specific gravity less than that desirable, will be carried by the water upwardly through the discharge passage **87** and into the discharge flume **15** through the opening **83** formed in the side wall of the receptacle, while the relatively heavy media having a specific gravity deemed to be desirable will settle to the bottom of the receptacle and will be withdrawn therefrom at a controlled rate by gravitational flow through the opening **91** and the passage **114** to the conveyors **108** and **110** which will carry the relatively heavy media upwardly and will discharge it onto the vibrating screen **29**.

The relatively large heavy media which does not pass through the openings **51** in the vibrating screen **29** will be discharged over the upper wall of the U-shaped conduit member **144** and into the inlet end of the discharged flume **15** while the relatively small heavy media which passes through the openings **51** onto the bottom wall **39** of the vibrating screen is discharged through the inlet opening **148** of the conduit **144** and is separated into substantially two equal parts by the divider **150**. The relatively small heavy media is delivered through the legs of the conduit **144** to the placer jigs **146** and **146*a*** by means of the water flowing through the conduit and is further divided into substantially equal parts by the vertical partitions **152** provided in each leg of the channel.

The relatively heavy small media or minerals delivered to the placer jigs **146** and **146*a*** is separated by them into heavy ends, which are withdrawn from the bottom of the jigs, and lighter residue materials which are discharged from the top of the jigs into the discharge flume. The heavy ends which are recovered from the jigs **146** and **146*a*** are then transferred to magnetic separating or classifying equipment of conventional construction furnished, if desired, by electric power from the generator **221** where the magnetic portion of the heavy ends is separated from the non-magnetic portion thereof. From time to time the heavy media may be removed from the riffles in the discharge flume and from the bottom end of the conveyor housings through access ports **250**.

What I claim is:

1. Mobile apparatus for separating a media mixture containing media of differing size and density, comprising: a mobile support frame; a receptacle carried by the frame having a mixed media receiving opening in the top thereof; a relatively heavy media discharge opening in the bottom wall and a relatively light media discharge opening in a side wall thereof and located at an elevation above said heavy media discharge opening, a discharge flume carried by the frame and having riffles therein and an inlet end connected with the side wall opening; baffle means fixed in the receptacle and extending from said side wall from above the light media discharge opening to adjacent but spaced above the heavy media discharge opening, said baffle means providing with said side wall a discharge passage for relatively light media and water, means for discharging water into the top of the receptacle at a controlled rate such that relatively heavy media therein will settle to the bottom of the receptacle and relatively light media will be flushed by the flow of water from adjacent the bottom of the receptacle upwardly through said discharge passage, through said light media discharge opening and into the discharge flume; a vibrating screen carried by the frame at an elevation above the discharge flume for separating relatively small heavy media from relatively large heavy media; means for vibrating said screen; conveying means carried by the frame and disposed between the outlet of the relatively heavy media discharge opening and the vibrating screen; means for controlling the flow of relatively heavy media from the receptacle bottom wall opening to the conveyor; said screen being inclined to discharge the relatively large heavy media separated thereby to the inlet end of the discharge flume; placer jig means carried by the frame for separating small relatively light from small relatively heavy media; and means for delivering the relatively small heavy media separated by the vibrating screen to the jig means.

2. Apparatus in accordance with claim **1** wherein the jig means is disposed adjacent the discharge flume and at an elevation thereabove and the relatively light media separated by the jig means is discharged to the discharge flume.

3. Apparatus according to claim **2** wherein said placer jig means comprises at least one placer jig disposed adjacent each side of the discharge flume, and said means for delivering the relatively small heavy media to the jigs comprises channel means extending from the vibrating screen to each of the jigs.

4. Apparatus according to claim **3** wherein said channel means includes a divider disposed adjacent the discharge end of the vibrating screen for dividing the flow of relatively small media from the vibrating screen to said channel and to the jigs into two substantially equal streams of media.

5. Apparatus according to claim **4** wherein a pair of jigs are disposed adjacent each side of the discharge flume, and said channel means includes a splitter means extending lengthwise thereof between the divider and the jigs for splitting the flow of media in the channel to each pair of jigs into a pair of substantially equal streams of media.

6. Apparatus in accordance with claim **1** wherein said conveying means comprises at least one endless mechanical conveyor; a hydraulic pump carried by the frame, power means operably connected with said hydraulic pump for driving it; hydraulic motor means; hydraulic fluid conducting means operably connecting the hydraulic pump with the hydraulic motor means; hydraulic fluid flow control means connected with the fluid conducting means for regulating the rate of flow of the hydraulic fluid to said hydraulic motor means; and drive means operably connecting the hydraulic motor means with said endless conveyor.

7. Apparatus according to claim **6** wherein said means for vibrating the screen comprises second hydraulic motor means carried by the frame, eccentric means connecting said second hydraulic motor means with the vibrating screen; conduit means operably connecting the hydraulic pump with the second hydraulic motor means, and second hydraulic fluid flow control means connected with said conduit means for regulating the flow of hydraulic fluid to said second hydraulic motor means.

8. Mobile apparatus according to claim **1** including loading means movable between a loading station and a position disposed at an elevation above said receptacle for separating large mixed media from small mixed media carried therein and for discharging the small mixed media into the receptacle, said means for discharging water into

the receptacle at a controlled rate comprising duct means having a normally open first outlet opening directed into the receptacle and a normally closed second outlet opening for directing water into the interior of the loading means means for controlling said first and second outlet openings, means carried by said loading means and engageable with said means for controlling the first and second outlet openings, when said loading means is disposed above said receptacle in position for discharging small mixed media thereinto, for actuating the controlling means thereby closing said first outlet opening and opening said second outlet opening.

9. Mobile appartaus according to claim **8** in which said loading means comprises a loader bucket having classifying screen means fixed therein adjacent to but spaced from the bottom wall thereof, an opening formed in the bottom wall of the bucket for discharging mixed media which passes through the classifying screen into the receptacle and means for vibrating said loader bucket, the controlling means including tubular means having a telescoping fit over the outer end of the duct means, said bucket and said tubular means having a passage connectable with said second outlet opening for discharging water into the interior of the loader bucket and against materials resting on the classifying screen.

10. Mobile apparatus according to claim **8** wherein said duct means comprises a supply pipe having an open end and having said first outlet opening formed in the wall thereof adjacent said open end, a tubular sleeve having one end slidably mounted in the open end of the supply pipe and with the remainder of the sleeve extending outwardly from said open end for a substantial distance, said second outlet opening being formed in the tubular sleeve adjacent its outer end.

11. Mobile apparatus according to claim **10** wherein the means for controlling the first outlet opening comprises an outlet opening formed in said one end of the tubular sleeve and movable into and out of communication with said first outlet opening, and for controlling said secnd outlet opening comprises a cylindrical fitting slidably mounted on the tubular sleeve adjacent its outer end, said cylindrical fitting having an outlet opening formed therein and movable into and out of communication with said second outlet opening.

12. Mobile apparatus according to claim **11** wherein resilient means is operably connected with said cylindrical fitting normally biasing it to a position wherein the outlet opening therein is out of communication with the second outlet opening, said resilient means also being operably connected with the tubular sleeve for normally urging it to a position wherein the outlet opening therein is in communication with the first outlet opening.

13. Mobile apparatus according to claim **12** wherein said resilient means is a coiled compression spring encircling the tubular sleeve with one end abutting against the open end of the supply pipe and with the other end abutting against the cylindrical fitting.

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