July 24, 1962 A. S. WATSON 3,045,825

DRY ORE SORTER

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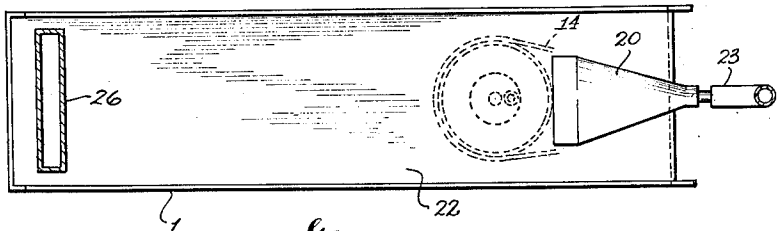


Fig. 2.

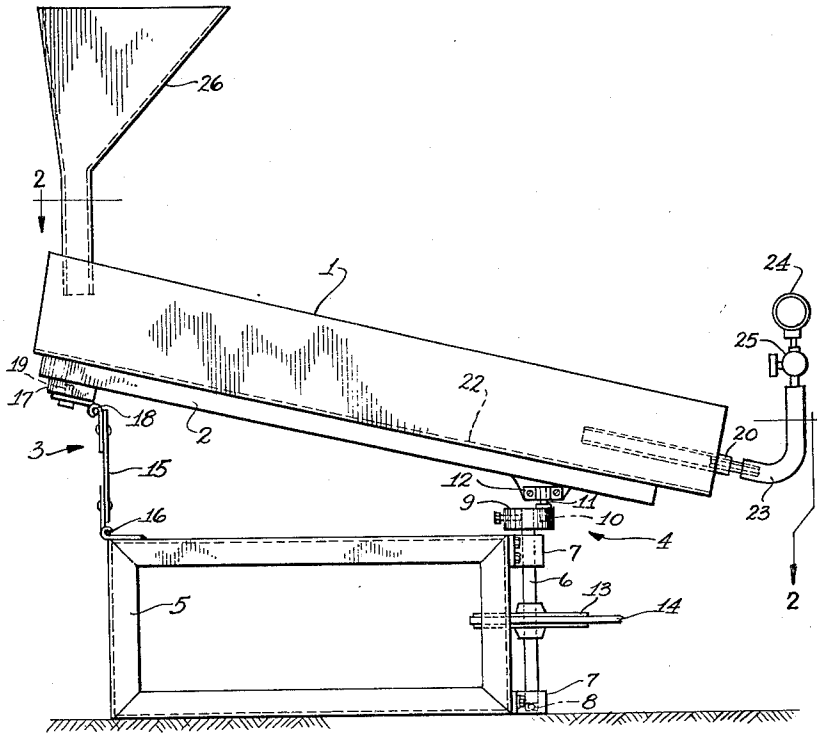


Fig. 1.

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This invention relates to mineral ore sorters of the dry type.

An object of the invention is to provide a dry mineral ore sorter which is of simple, inexpensive construction, which is of improved effectiveness in operation and which is subject to easy maintenance and long life.

The invention will be described with reference to the accompanying drawing, in which:

FIGURE 1 is a side elevation of an apparatus in accordance with the invention, and

FIGURE 2 is a partial plan view.

In the drawing, **1** is an open-ended trough mounted on a frame **2** and supported in inclined position by a head support assembly **3** and a tail support assembly **4** mounted in a main frame **5**.

One of the assemblies **3** and **4**, and preferably the tail assembly **4** comprises a vertically disposed shaft **6** carried by bearings **7** mounted in frame **5** and having its lower end supported in a thrust bearing **8**. A crank **9** is carried by the upper end of the shaft and has an eccentrically arranged socket **10** for reception of a crank pin **11** fixed to a bearing block **12** mounted on the trough frame **2**. Means for driving the shaft may comprise a pulley **13** and drive belt **14**. It will be apparent that rotation of the shaft will impart a rotary motion to the overlying end portion of the trough **1**.

The assembly **3** comprises an arm **15** having one end hingedly connected to the main frame **5** at **16** and its other end hingedly connected to a bearing block **17** at **18**. The overlying end portion of the trough is pivotally mounted on the block **17** by means of a pivot pin **19**. It will be apparent that, in response to rotary movement of the opposite end of the trough under the influence of the rotating shaft **6**, a limited oscillating movement will be imparted to the end of the trough supported by assembly **3** as permitted by the pivot **19** and hinged connections **16** and **18**.

An air pipe **20** extends a minor distance longitudinally into the lower open or tail end of the trough with its outlet **21** directed towards the head end of the trough. The pipe **20** is spaced above the floor **22** of the trough and is substantially parallel thereto. It is connected by means

of tube **23** with an air line **24** controlled by a valve **25**.

Ore concentrate, such as granulated iron ore concentrate, is fed to the head end of the trough by hopper means **26**.

In operation, with the trough under the combined rotary and oscillating motions described, ore is fed into the head end of the trough and as it travels down the trough under the influence of gravity and the motion of the trough, the heavy minerals settle towards the trough floor while the lighter concentrates move to the top of the ore stream. The jet of air directed along the trough by the pipe **20** and into the upper portion of the ore stream in countercurrent relation thereto entrains the fine light mineral particles on the top of the ore stream and blows them out of the open upper end of the trough where they may be collected in any suitable manner. The heavier or coarser ore particles continue down the trough and pass under the air pipe **20** and are discharged at the tail end of the trough into any suitable receptacle.

I claim:

An ore sorter comprising an inclined trough having an upper feed end and a lower discharge end, a support assembly for said discharge end of said trough including a vertically arranged shaft, a crank on said shaft and having an eccentrically arranged socket, a crank pin on said trough and extending into said socket and means for driving said shaft to impart horizontal rotary movement to said discharge end of said trough, and a support assembly for said feed end of said trough comprising a supporting frame, an arm having one end hinged to said frame about a substantially horizontal axis, a pivot block hingedly carried by the other end of said arm about a substantially horizontal axis, a vertically disposed pivot pin connecting said trough and block and permitting limited oscillating movement of said feed end of said trough, and an air supply pipe extending into the lower end of said trough and having an outlet directed toward the upper end of said trough, said pipe being spaced above the floor of said trough.

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