Sept. 22, 1942. A. L. J. QUENEAU 2,296,402

ATTRITION MILL

Filed June 9, 1941

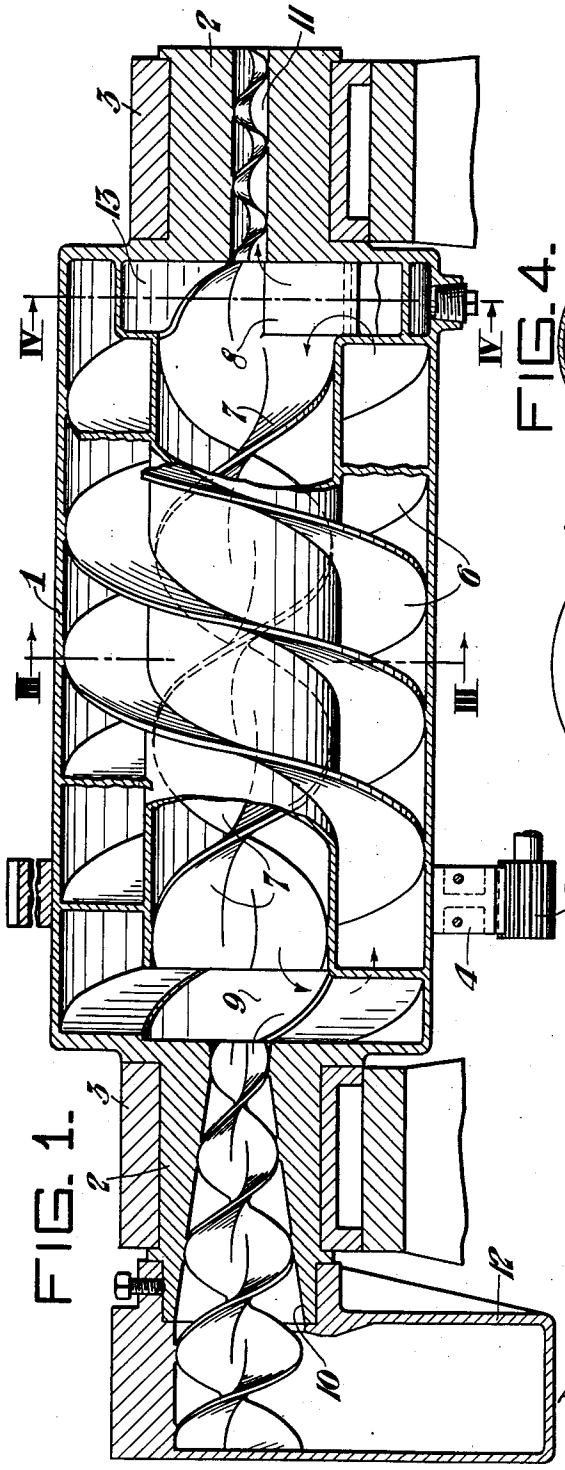


FIG. 1.

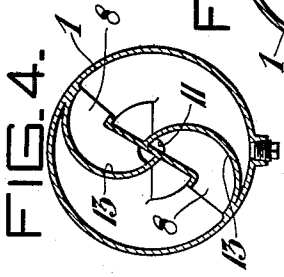


FIG. 4.

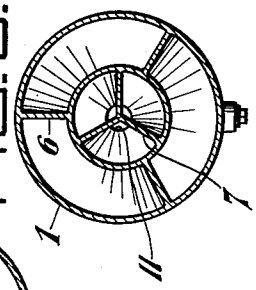


FIG. 5.

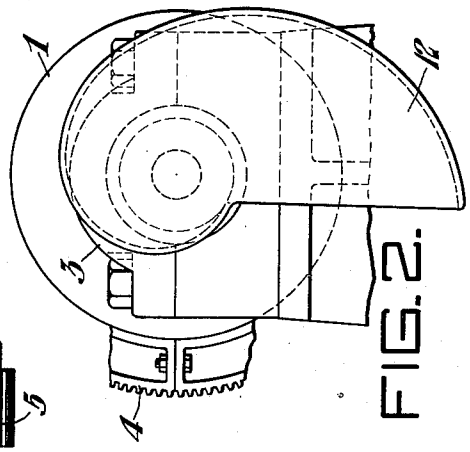


FIG. 2.

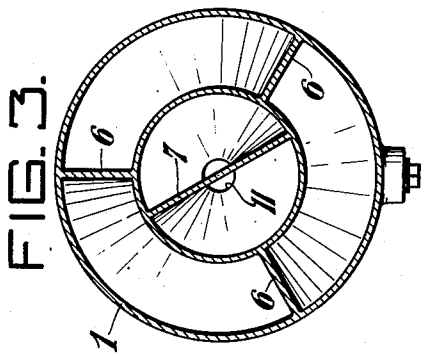


FIG. 3.

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ATTRITION MILL

Augustin Leon Jean Queneau, Peapack, N. J.

Application June 9, 1941, Serial No. 397,293

1 Claim. (Cl. 83—9)

This invention relates to attrition mills adapted to work on ore particles, the primary object being to prolong the service life and reduce the operating power required in the case of this type of equipment.

A specific example of a mill embodying the features of the invention is illustrated by the accompanying drawing, in which:

Figure 1 is a longitudinal section;

Figure 2 is an end view;

Figure 3 is a cross section from the line III—III in Figure 1;

Figure 4 is a cross section from the line IV—IV in Figure 1; and

Figure 5 is the same as Figure 3 but shows a modification.

More specifically, the illustrated mill includes a drum 1 having end journals 2 and bearings 3 mounting the journals 2 to permit rotation of the drum 1. This rotation is effected by a drive consisting of a ring gear 4 encircling and fixed to the drum 1, which is in mesh with a driven pinion 5.

The drum 1 contains longitudinally extending, oppositely pitched spiral passageways 6 and 7 arranged one inside the other with their ends respectively intercommunicating as at 8 and 9. The journals 2 have longitudinally extending internal conduits 10 and 11 opening to the passageways 6 and 7 and which are free from the bearings 3, these conduits being in the form of similarly pitched spiral passageways extended longitudinally of the journals. The conduit 11 has a considerably smaller cross sectional area than the conduit 10.

The various spiral passageways function to gravitationally feed the ore particles in the direction of the spiral pitches when the drum is rotated. The arrangement is such that upon rotation of the drum 1 the spiral passageway of the conduit 10 feeds the ore into the drum and the spiral passageway of the conduit 11 feeds from the drum, the conduit 10 thus constituting the drum entrance while the conduit 11 constitutes its exit.

A scoop 12 is fixed to the journal having the entrance 10 so as to rotate therewith, it functioning to scoop up ore particles from a supply and feed them to the entrance conduit 10 and so into the drum 1, the exit 11 of relatively smaller cross sectional area serving to slowly bleed the ore particles continuously from the drum.

Upon introduction into the drum 1, the ore particles fall to the bottom of the drum and are gravitationally fed longitudinally along its length to its other end by the spiral passageway 6. At this end radially grooved vanes 13 are arranged for the purpose of picking up the ore particles and gravitationally feeding them into the passageway 7 which, being oppositely pitched to the passageway 6, feeds the ore particles to the other or entrance end of the drum where they again fall to its bottom by way of the opening 9. Thus, the ore particles continuously recirculate so as to secure the attrition effect desired, the smaller area of the conduit 11 as contrasted to that of the conduit 10 preventing any but a small portion of the ore particles from leaving the drum. At the start of operations this conduit 11 may be closed until the ore particles have recirculated sufficiently to warrant bleeding to start.

It is to be noted that all of the various passageways are immovably fixed respecting each other and the respecting drum, this including the spiral passageways of the conduits. Thus, the entire mill is a single integral part completely free from any relatively sliding surfaces, the only frictional action involved being that of the ore particles sliding through the passageways. The sliding surfaces of the bearings 3 which mount the journal 2 are completely separated from the ore particles since the latter are fed through the insides of the journals 2 by way of the conduits completely free from the bearings. As shown by the drawing, the entire unit may be made as a single casting, although the parts may be made separately and rendered integral by welding.

These features are all very important when it is remembered than an attrition mill for handling ore particles must be a large affair and that the material it handles is of a very abrasive nature and is, in addition, very prone to jam between parts that must relatively slide. The material is, of course, very destructive to sliding surfaces of any sort.

This application is a continuation-in-part of an application filed August 18, 1939, bearing Serial No. 290,910.

I claim:

An attrition mill including a drum having opposite end journals and bearings mounting said journals to permit rotation of said drum, the latter containing longitudinally extending, oppositely pitched spiral passageways arranged one inside the other with their ends respectively intercommunicating, said pasasgeways being immovably fixed respecting each other and respecting said drum, and said journals both having internal conduits opening to said passageways and free from said bearings, said conduits being in the form of spiral passageways that are respectively similarly pitched with one of smaller cross sectional area than the other, said conduits being immovably fixed respecting said journals and the latter being immovably fixed respecting said drum.

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