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CENTRIFUGAL MACHINE AND PROCESS

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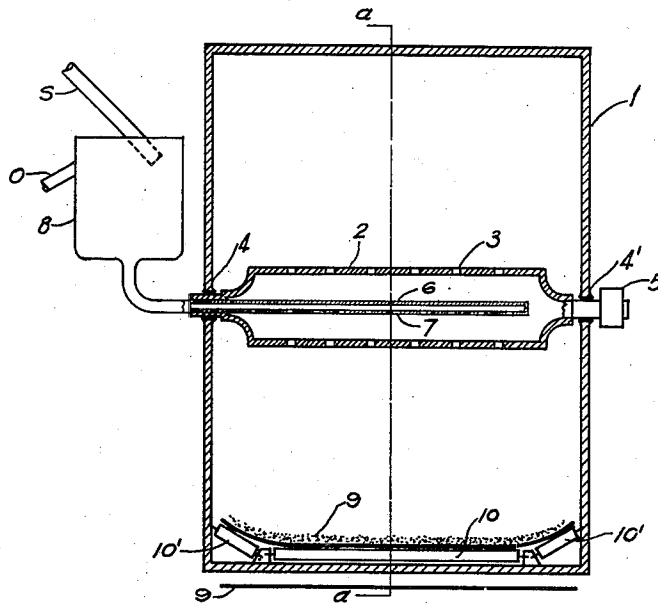


Fig. I.

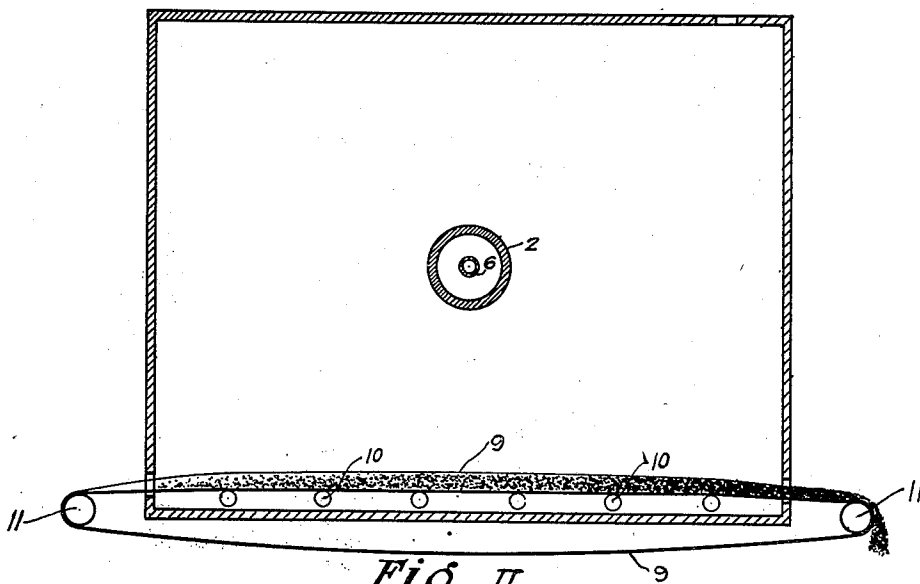


Fig. II.

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CENTRIFUGAL MACHINE AND PROCESS.

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To all whom it may concern:

Be it known that I, RICHARD MACKAY, JR., a citizen of the United States, residing at Gage and Riverside Roads, Riverside, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Centrifugal Machines and Processes, of which the following is a specification.

This invention relates to a process and apparatus for dividing or comminuting fusible material such as pitch, asphalt, resin, etc., whereby it is prepared in a finely divided or comminuted state and then collected together in a convenient manner. It relates more particularly to a perforated centrifugal machine which is mounted on a horizontal axis in a housing having a conveyor along the bottom of the housing and so arranged that the collection of the comminuted particles is more convenient than with the vertical type of centrifugal.

When perforated baskets mounted on vertical axes are used with which to comminute fused material by projecting it outwardly through the perforations by means of centrifugal force and letting it cool, it has been found that a comparatively wide circular space is required through which the material may be permitted to be thrown out and descend to the floor. As a result more floor space is required for a given capacity than with the horizontal type. This feature of minimum floor space secured by the use of this process is of great value. Also with the vertical type the product is distributed over a circular area and hence is less easy to collect than in this arrangement whereby it falls in a relatively narrow rectangular space on a conveyor.

Other objects and advantages of the invention will be obvious as the description proceeds.

The invention will be readily understood by reference to the accompanying drawings in which:

Fig. I is a side view of the machine, partly in section, showing how the process can be carried out.

Fig. II is a sectional view taken along the line *a-a* of Fig. I.

In the drawings reference character 1 refers to a housing within which is mounted the centrifugal machine 2 whose diameter

is small compared to its length having perforations 3 in its walls, and mounted in bearings 4 and 4' for rotation upon a horizontal axis. The centrifugal machine 2 is driven from one end by a driving means 5 such as a motor or pulley. A feed pipe 6 having outlets 7 leads preferably by means of a liquid tight fitting through the bearing 4 to the interior of the centrifugal machine 2. This pipe 6 leads from a tank 8 which is provided with an overflow pipe O and a supply pipe S.

A conveyor 9 passes horizontally along the lower portion of the housing 1 over rollers 10 and 10', the rollers 10' being mounted at an angle so as to cause the conveyor in its travel through housing 1 to assume a trough-like shape, as shown, to prevent material from overflowing the edges of the conveyor. The conveyor 9 passes around rollers 11 which may be driven by any convenient means not shown.

The operation is as follows: The material in a hot liquid condition is fed into the tank 8 and flows through pipe 6 to the rapidly rotating centrifugal machine 2 where it is distributed in a substantially uniform manner to the interior thereof and is thrown out through the perforations 3. If desired, the outlets 7 from pipe 6 may lead outwardly at an angle in order to feed the material in a tangential direction to the centrifugal machine 2. The material thrown out of the perforations 2 assumes the form of round bodies, either globular or filamentary which soon cool and fall to the floor in the form of small solid bodies. The size of the particles, when in globular form, will depend upon the nature and temperature of the material, the size of the perforations 3, and the speed and diameter of the machine 2, and the material may be extruded either in the shape of shot-like bodies or filaments depending upon the fluidity or plasticity of the particular material that is being treated.

It is obvious that if the material is fed from the tank 8 more rapidly than it can escape from the perforations 3, the machine 2 will become filled and the material will finally accumulate in the tank 8 until the overflow pipe O is reached; provided the supply from pipe S is sufficiently copious. In this case it is evident that the pres-

sure at outlets 3 caused by centrifugal force is increased by the amount of the hydrostatic pressure of the liquid column.

Several advantages accrue from this horizontal centrifugal machine which the vertical type does not possess. The material can be supplied so that substantially the same amount reaches each one of the perforations 3 whether the machine is kept filled or not; the material is thrown out into a narrow space confined between two vertical planes substantially no farther apart than the length of the centrifugal machine thus saving space; the comminuted material can be easily gathered up by means of a conveyor through this narrow space; a blast of cooling air can be introduced near the bottom of the narrow housing and caused to rise thus providing an effective cooling space to assure solidifying of the material before it reaches the floor, because the air passes upwardly through a considerable distance filled with the particles instead of through a narrow band of particles as would be the case with the vertical type; in case vapors or fumes are given off of the hot comminuted material, they can be easily collected due to the narrow space within the housing, and condensed or otherwise disposed of.

The housing 1 is made sufficiently high and long so that very little, if any, of the material will strike the top or ends of the same.

It has been found in practicing this invention that, for example, when pitch of about 250° F. melting point is used, shot of a size that will pass through a 20 mesh screen may be produced with a centrifugal machine having a diameter of 8 inches and perforations of $\frac{1}{4}$ inch when driven at a speed of about 2000 revolutions per minute.

I claim:

1. The herein described process which comprises comminuting fusible material by projecting it in fluid form through a series of rows of rotating apertures, each row being in a single vertical plane and the apertures in any particular row being substantially equally spaced from a central point so that the material from the respective

rows will be projected into a series of vertical planes, cooling the comminuted material in air, collecting the comminuted material and moving it substantially parallel with said vertical planes.

2. The herein described process which comprises maintaining a perforated centrifugal machine which is mounted upon a horizontal axis full of liquid fusible material and projecting the material through said perforations by centrifugal force and hydrostatic pressure.

3. In an apparatus of the class described, a perforated centrifugal machine mounted upon a horizontal axis, means for rotating said machine, means for feeding material into said machine through a liquid tight joint in the axis thereof whereby said machine may be maintained entirely full of said material, and means for maintaining a static head sufficient to cause pressure to be exerted upon the entire inner surface of said machine.

4. In an apparatus of the class described, a perforated centrifugal machine mounted upon a horizontal axis, means for rotating said machine, means for feeding material into said machine through a liquid tight joint in the axis thereof whereby said machine may be maintained entirely full of said material, and a housing surrounding said machine and a conveyor in said housing.

5. In an apparatus of the class described, a perforated drum mounted upon a horizontal axis, means for rotating said drum, means for feeding material into said drum and maintaining a static head upon all portions of the interior of said drum.

6. In an apparatus of the class described, a perforated drum mounted upon a horizontal axis, means for rotating said drum, means for feeding material into said drum and maintaining a static head upon all portions of the interior of said drum and a housing surrounding said machine and a conveyor in said housing which travels at an angle to the axis of said drum.

In testimony whereof I affix my signature.

RICHARD MACKAY, JR.