

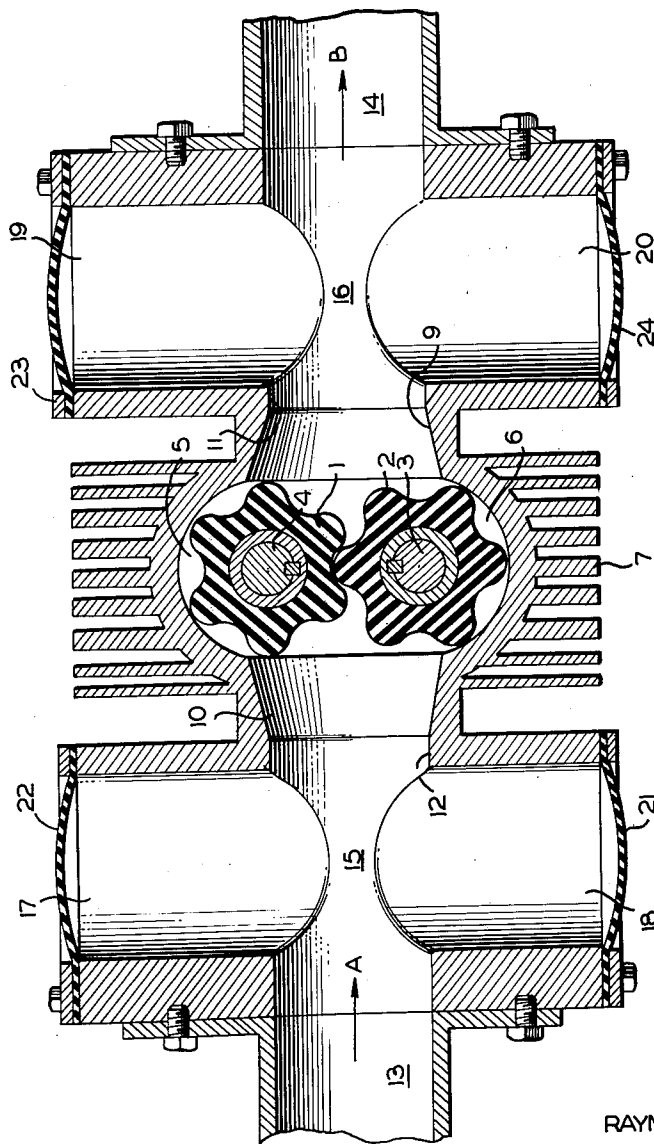
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PUMP FOR PULVERULENT MATERIAL

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PUMP FOR PULVERULENT MATERIAL

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4 Claims. (Cl. 103—126)

The object of the invention consists of the provision of a pump intended for the drawing off by suction and discharging of powdered, pasty and similar materials.

It is characterised by the means employed, considered both together and separately, and more particularly by pinions of a flexible material carrying out their rotation in a rigid casing, of slightly reduced opening, but opening into two compensating and regulating chambers disposed in front of the coupling with the conduits for admission and evacuation, the free space situated between the two chambers being of the same diameter as that of the orifices of the casing and of the conduits.

The accompanying drawing, given by way of non-limiting example of one of the forms of construction, illustrate the object of the invention:

The apparatus is shown in its entirety, as seen in longitudinal section.

The generally cylindrical pinions 1, 2 of flexible deformable and elastic material are mounted on the shafts 3, 4 and rub along the curvilinear sectors 5, 6 of the rigid casing.

These sectors are cooled by air circulation fins 7, 8.

Ramps 9, 10 reach to the orifices 11, 12 which preferably have the same diameter as the conduits 13, 14.

The orifices 11, 12 of the casing open into an intermediate area 15, 16 of the same diameter as the conduits 13, 14. These intermediate areas have chambers 17, 18, 19, 20 extending therefrom, and the chambers are closed at their outer extremities by flexible members 21, 22, 23, 24. These chambers are situated in the upper and lower parts of the casing and, in effect, create two sets of opposed sub-chambers at the inlet and outlet of the pump which may be cylindrical in cross-section.

The operation of this pump is explained in the following manner:

The rotation of the pinions 1, 2 rubbing along the part-cylindrical recesses 5, 6 creates a priming vacuum which draws the powder current into the conduit 13, the chamber 15, and the orifice 12.

At this moment, the powdered mass is taken by the recesses in the pinions and propelled towards the sectors 5, 6 in order to be projected towards the orifice 11.

The flexibility of the pinions permits, at the same time, a stirring, and mixing in such a manner that the traction becomes mechanical rather than pneumatic.

Furthermore, the deformation of the teeth assures the ejection of all traces of powder, and the projection of the transported portion, which creates turbulences accelerates the transportation.

The part played by the chambers 17, 18, 19 and 20 is most important.

First of all, the slight accumulation of output in the chambers 17, 18 permits the pump to feed in a continuous manner in case of jumping or where there is a difference in the volume which can be sucked in.

Under the effect of the vacuum the membranes 17, 22

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deform and exert pressure on the material in such a manner that the distribution is automatically controlled, which avoids stoppages and other consequences resulting from irregularities of feed, see arrow "A."

5 The powdered material passes into the pinions and is projected into the space 16. The chambers 19, 20 fill themselves slightly, but when the material reaches the conduit 14, arrow "B," it produces a vacuum. Thereafter, the two sets of chambers play a very important part, that of sending the material to the entry and to the outlet of the pump. The work of the pinions is diminished, making practical the cooling of the casing by air; a result which has not hitherto been obtainable.

15 With a minimum of motor power there is obtained a power and regularity of output at very high volume; the flexible membranes, acting as resiliently flexible diaphragms, automatically control the pressures and the available useful space.

Furthermore, these "enlarged" spaces assure a suction 20 which eliminates any return.

It is thus possible to displace large amounts of powdered material without breakage and without dust.

Finally, through the use of membranes described above there is avoided all pneumatic, mechanical or 25 other turbulence, together with elimination of the resistance which the current would normally meet on leaving the chamber of the casing and flowing into a smaller intake channel.

The shapes, dimensions, and dispositions of the various 30 elements could be varied within the limits of equivalency, as could the materials utilised for their manufacture, without thereby changing the general conception of the invention which has just been described.

I claim:

35 1. A pump for pulverulent and pasty materials comprising in combination, a pump body of rigid material having a through passage and in the wall of said passage at symmetrically opposed positions two part-cylindrical recesses the axes of which are parallel in a plane normal 40 to the axis of the through passage, two generally cylindrical pinions disposed in the through passage and each having its axis of rotation coincident with the axis of one of the recesses and being of the same overall radius as the recesses, a radially external portion of each pinion being 45 resilient and provided with a plurality of longitudinal ribs and grooves and the pinions being in mesh by said ribs and grooves, the pump body having an inlet chamber therein in communication with one end of the through passage, a portion of the wall of said inlet chamber being 50 constituted by a resiliently extensible diaphragm, the pump body having an outlet chamber therein in communication with the other end of the through passage and a portion of the wall of said outlet chamber being constituted by a resiliently extensible diaphragm, said pump 55 body including an inlet port opening into the inlet chamber and an outlet port opening from the outlet chamber.

2. A pump, for pulverulent and pasty materials, as claimed in claim 1, wherein the inlet port and the adjacent end of the through passage are of the same diameter, 60 the inlet chamber being constituted by two opposed radial cylinders extending radially therefrom with the outer end of each of said cylinders closed by said resiliently extensible diaphragm.

3. A pump, for pulverulent and pasty materials, as

claimed in claim 2, wherein the outlet port and the adjacent end of the through passage are of the same diameter, the outlet chamber being constituted by two opposed radial cylinders extending radially therefrom, the outer end of each of said cylinders being closed by said resiliently extensible diaphragm.

4. A pump, for pulverulent and pasty materials, as claimed in claim 1, wherein the through passage taken from one end to the other comprises a first cylindrical portion communicating with the inlet chamber, a divergent portion, the part-cylindrical recesses, a convergent portion, and a second cylindrical portion communicating with the outlet chamber.

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