

PATENT SPECIFICATION

989,051

DRAWINGS ATTACHED.

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COMPLETE SPECIFICATION.

Apparatus for Opening Up Fibrous Bundles of Crude Asbestos Separated from the Source Rock.

I, KARL ADOLF OEBSTERHELD, of German Nationality, residing at Luthe near Wunstorf/Hannover, Germany, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to apparatus for opening up fibrous bundles of crude asbestos separated from the source rock, in which the fibrous asbestos bundles mixed with a liquid are subjected with controllable high hydraulic pressure to a mechanical treatment resulting in the opening up of the fibrous asbestos bundles.

In practice, edge runners, cross beater mills, disc attrition mills or disintegrators, have hitherto been used in general for opening up asbestos material separated from the source rock. In such machines, the asbestos material is known to be subjected to a very vigorous treatment which involves a considerable part of the fibres in getting damaged and shortened. By these known devices, which use relatively moving parts, it is not possible to open up the fibrous bundles in such a manner that the individual fibres are completely separated from one another.

The object of the present invention is to eliminate the aforementioned disadvantages and to achieve that the fibrous asbestos bundles mixed with a liquid and supplied with high hydraulic pressure are rapidly opening up to a hitherto not attainable degree without damaging the delicate fibres.

According to the present invention, an apparatus for use in opening up fibrous bundles of crude asbestos separated from source rock, comprises a stationary pipe coil, a pump connected to an inlet end of

said pipe coil, a motor, and a variable speed gear coupling the motor to the pump. The variable speed pump is adapted to force the fibre-liquid mixture through said pipe coil.

A pipe connection may be provided between the outlet end of the pipe coil and the inlet of the pump, to permit recycling of the fibre-liquid mixture through the coil.

It will be appreciated that this apparatus is of extremely simple design using no relatively moving parts, which accounts for the gentle yet effective treatment of the fibres. Other advantages of this apparatus are extraordinarily low wear and absolute reliability in operation. By varying the speed of the pump, the rate at which the fibre-liquid mixture is fed through the pipe coil can be adjusted in a simple way so that in each case the fibrous material actually to be treated will be opened up with optimum efficiency.

Expediently, the pipe coil is arranged with its longitudinal axis vertically upright. This arrangement has the advantage that it provides for easy cleaning and flushing of the pipe coil when the apparatus is to be shut down or cleaned.

An embodiment of the invention will now be described by way of example and with reference to the accompanying drawing, the only Figure of which is a vertical section through an apparatus according to the invention, the associated driving and pumping units being represented diagrammatically and on a reduced scale.

Referring to the drawing, the device for opening up fibrous bundles of crude asbestos separated from the source rock comprises a helically wound pipe coil 1 disposed in an annular space 4 defined between two co-

[Price 4s. 6d.]

axially telescoped hollow sheet-metal cylinders 2 and 3 at both ends of which cover plates 5 and 6, respectively, are provided which are connected to each other by means of screw bolts 7. The lowermost pipe length 8 of the coil 1 passes through a central opening in the plate 5, whereas the uppermost pipe length 9 of the coil 1 passes radially through an opening 10 in the wall of the outer hollow cylinder 3.

The lowermost pipe length 8 of the pipe coil 1 is provided with an internal pipe thread and connected to the pressure pipe joint of a feed pump 12 through a pipe conduit 11. The uppermost pipe length 9 of the pipe coil 1 is also provided with an internal pipe thread and connected to a two-way cock 13 from which a conduit 14 leads to where the opened or broken up fibrous material is subjected to further treatment, e.g. mixed with cement or dried. A branch conduit 15 establishes a communication between the two-way cock 13 and a reservoir 16 from which the fibre-liquid mixture contained therein and, if desired, provided with friction-increasing or colouring substances can be sucked off through a suction pipe 19 by the pump 12, which is driven by an electric motor 17 through a variable speed gear 18, to be subsequently forced with high pressure through the pipe conduit 11 into the pipe coil 1 by the same pump 12.

When the fibre-liquid mixture is fed with high pressure through the pipe coil 1, the fibrous asbestos bundles are bent in longitudinal direction and vigorously rub against the inner wall of the pipe coil and against one another. By utilizing in this manner the pressure energy supplied, the individual fibres are gradually loosened from the fibrous asbestos bundles which thus are opened up as desired. The variable speed gear 18 permits the speed of the pump 12 to be so controlled that depending on the type of crude asbestos to be opened up the fibres will be opened up in a fully satisfactory manner within a short period of treatment.

The two-way cock 13 may be operated

either automatically or by hand so that the fibre-liquid mixture is conveyed to an after-treatment station either after having passed the pipe coil 1 only once or after two or more complete circulations through the system including the reservoir 16, the pump 12 and the pipe coil 1. The purchase and operating costs for the above-described apparatus are considerably lower than would be involved in the case of similar devices using a driven rotary part.

It is also possible to arrange the pipe coil 1 so that its longitudinal central axis lies in a horizontal or an inclined plane, respectively. Generally, the vertical arrangement of the pipe coil 1 is to be preferred because it facilitates emptying and cleaning of the pipe coil 1. As to the mode of operation of a pipe coil arranged about a vertical axis it is of no importance whether the fibre-liquid mixture is fed through the pipe coil 1 from above or, as in the illustrated case, from below.

WHAT I CLAIM IS:—

1. Apparatus for use in opening up fibrous bundles of crude asbestos separated from source rock, comprising a stationary pipe coil, a pump connected to an inlet end of said pipe coil, a motor, and a variable speed gear coupling the motor to the pump.

2. Apparatus as claimed in claim 1, comprising a recycling pipe connection between the outlet end of the pipe coil and the inlet of the pump.

3. Apparatus as claimed in either of claims 1 and 2, wherein the pipe coil is arranged with its longitudinal axis vertical.

4. Apparatus for opening up fibrous bundles of crude asbestos separated from the source rock, as herein described with reference to and as illustrated by the accompanying drawing.

For the Applicant,
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253, Gray's Inn Road,
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D. Burke

Acting for Comptroller,
The Patent Office, 25, Southampton Buildings, LONDON, W.C.2.

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