Nov. 15, 1938. C. B. WHITE 2,136,988

METHOD OF AND APPARATUS FOR PRODUCING MINERAL WOOL

Filed Dec. 12, 1936

Fig. 1.

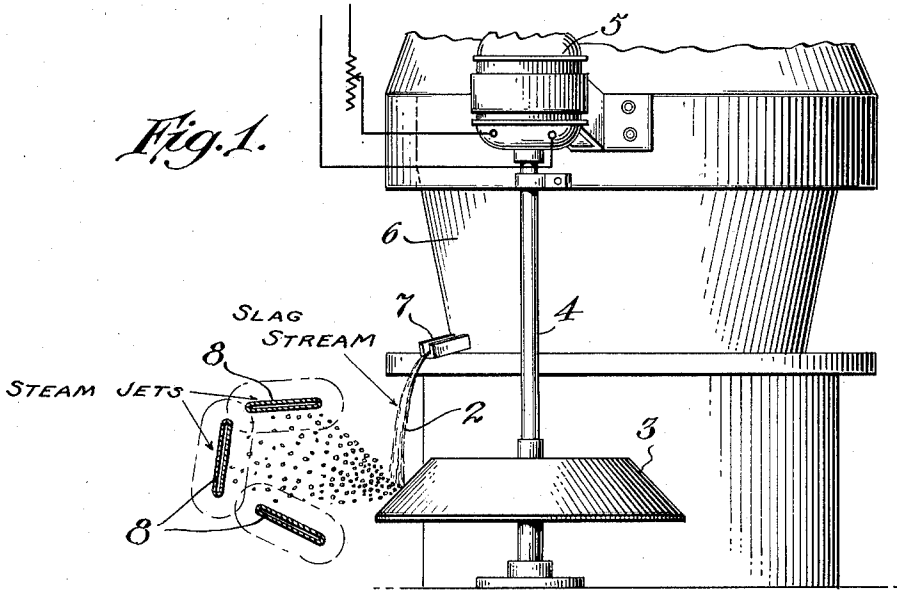
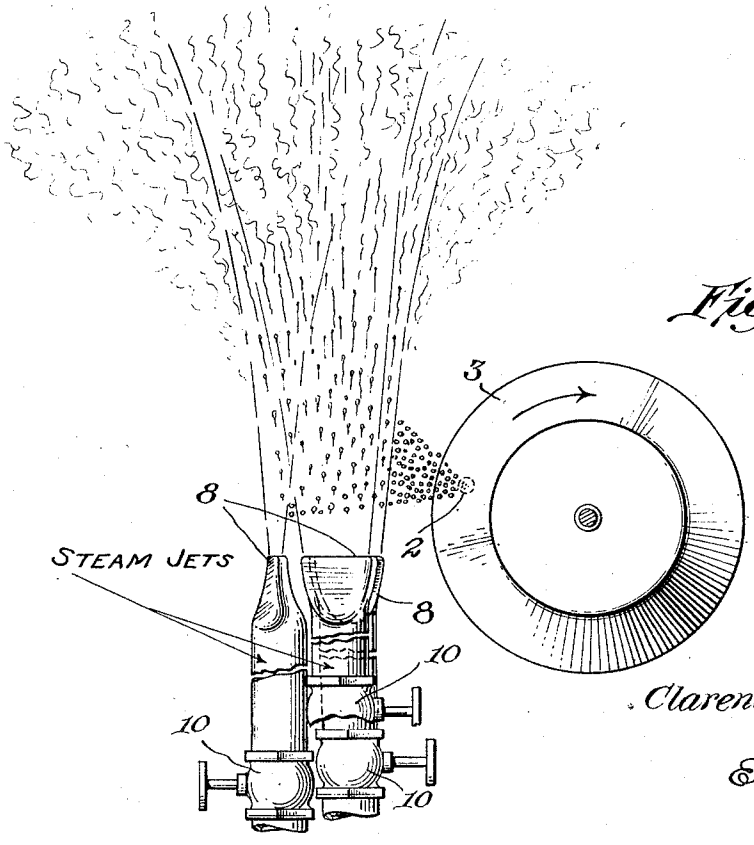


Fig. 2.



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Patented Nov. 15, 1938 2,136,988

UNITED STATES PATENT OFFICE

2,136,988

METHOD OF AND APPARATUS FOR PRODUCING MINERAL WOOL

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Application December 12, 1936, Serial No. 115,623

3 Claims. (Cl. 83—91)

This invention relates to the production of mineral or rock wool which is made by subjecting a stream of molten rock or molten slag to a blast of steam as it is drawn from a cupola or furnace, thereby disintegrating the molten globules and spinning them out into a fibrous wool-like mass.

The blast to which the slag stream is subjected breaks the slag into small separated globules, each of which, in leaving the mother stream, string out into a fiber. If the globule is too large it will lose its velocity before the fiber is entirely spun out. The unspun head forms one of the most objectionable forms of shot. The shot are so small and numerous and so intimately commingled with the fibers that separating them at any time is a task which is costly and destructive of the wool. Various means have been tried for the purpose of spinning the fibers without leaving shot or heads of any appreciable size by regulating the blast of air, steam or the like but without very much success. Low velocity blasts leave much of the slag unspun and high velocity blasts hit the slag so suddenly that a large percentage of spheroids are torn from the stream without properly forming any fiber.

The principal object of my invention is to provide a method for initially disintegrating the molten slag into a spray or shower of fine globular particles and then impelling the stream of minute molten particles into the path of a blast which spins all of the globules into fluffy woolly fibres or filaments without leaving any shot or heads.

My method of producing mineral or rock wool free from shot and the manner in which it is accomplished will be understood from the following description in connection with the accompanying drawing, in which—

Figure 1 is schematic view showing in elevation an apparatus embodying my invention; and Figure 2 is a top plane view of the same.

In carrying out my invention in the embodiment shown, I provide a rotary disk 3, preferably frusto-conical, which is mounted upon a vertical shaft 4 driven by a suitable motor 5. The disk is so positioned that the molten slag stream 2 flowing from the crucible or furnace 6 through the discharge spout 7, strikes the peripheral surface of the disk. The impact of the stream with the rapidly rotating disk disintegrates the liquid slag and breaks it up into a spray of fine globules which are expelled by centrifugal force and projected in a shower into the path of the blast of steam issuing from a plurality of nozzles or steam jets 8 connected to a steam supply. The disk may be driven at any suitable speed from 1000 to 3000 R. P. M. and is so coordinated with the velocity of the steam that the shower of liquid slag globules will enter the blast at the proper angle to produce the desired result of complete filamentation entirely free from shot or heads.

In the method of producing rock wool or mineral wool, heretofore, the steam jet has been directed into the slag stream as it issued from the spout of the furnace or crucible. The high velocity blasts hit the slag so suddenly that a large percentage of the spheroids are torn from the stream without apparently forming any fibers or in such manner that only partially spun fibers result. By initially subjecting the molten slag stream to a disintegrating process so that the liquid slag is broken up into drops or minute globules which are then projected in a shower of separate particles into the path of the steam jets, the full force of the blast is directed uniformly against each of the individual preformed particles. This results in uniformity as to size and texture of the fibers and ensures a complete filamentation of every globule while it is in the molten state. The two stages or steps of my process thus coact to eliminate the defects of prior methods and to produce a superior product of mineral wool.

I have indicated that the speed of the rotary slag disrupting disk 3, may be varied by controlling the speed of the driving motor 5, and that the velocity of the steam jets issuing from the nozzles 8 may be controlled by the valves 10. The angular relation of the nozzles may be adjusted to produce the desired configuration and area of the blast to coact most efficiently with the spray of comminuted globules of liquid slag as it is projected by centrifugal force from the surface of the rapidly rotating disk.

I claim:

1. The method of producing mineral wool from molten slag, which consists in interposing an annular upwardly inclined rotating surface into a freely falling stream of molten slag to thereby disintegrate the stream into a spray of comminuted particles and projecting the spray into a gaseous stream traveling at high velocity transverse to the path of the projected spray.

2. In an apparatus for producing mineral wool, means for supplying a stream of freely falling molten slag, a rotary device having an impinging surface positioned to intercept said stream at an angle thereto, means for rotating said device at any desired speed to thereby disintegrate the slag and project a spray of the resulting particles, and means for directing a gaseous blast

transverse to said spray to cause the filamentation of said particles.

3. In an apparatus for producing mineral wool from molten slag, means for supplying a freely falling stream of fluid slag, a rotating device having an annular surface inclined to the path of said stream and positioned to receive the impact of the stream to thereby disintegrate the slag and project it by centrifugal action into a spray of comminuted particles, and means for projecting a plurality of steam jets transverse to said spray to thereby cause the filamentation of said particles.

CLARENCE B. WHITE.