A. D. ELBERS.

PROCESS AND APPARATUS FOR TREATING MINERAL WOOL.

No. 191,524. Patented June 5, 1877.

Fig: 1

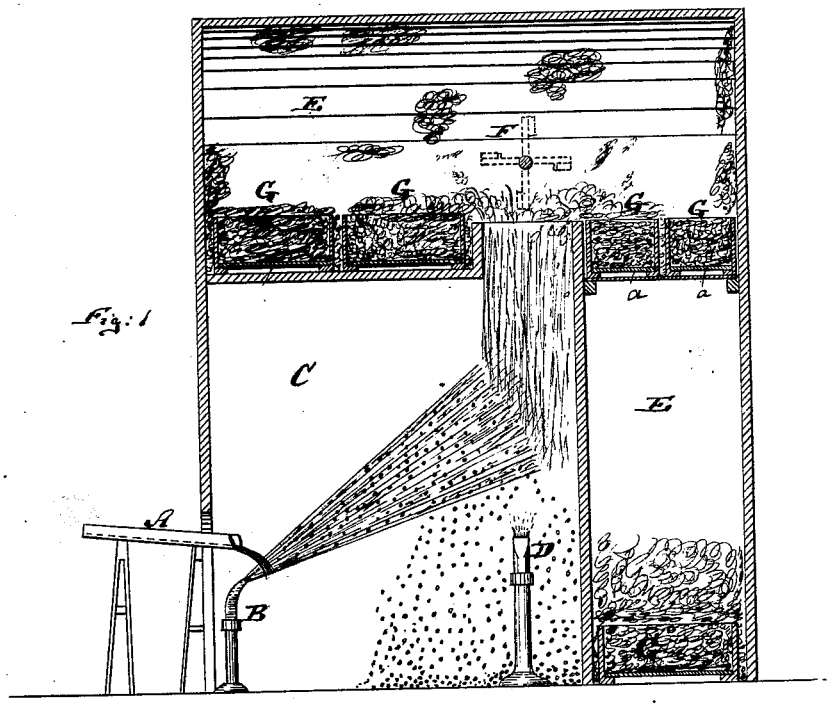
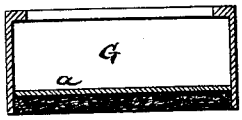


Fig: 2



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UNITED STATES PATENT OFFICE.

ALEXANDER D. ELBERS, OF HOBOKEN, NEW JERSEY.

IMPROVEMENT IN PROCESSES AND APPARATUS FOR TREATING MINERAL WOOL.

Specification forming part of Letters Patent No. **191,524**, dated June 5, 1877; application filed March 6, 1877.

To all whom it may concern:

Be it known that I, ALEXANDER D. ELBERS, of Hoboken, in the county of Hudson and State of New Jersey, have invented a new and useful Improvement in the Treatment of Mineral Wool, of which the following is a specification:

Figure 1 in the drawing represents a sectional elevation of the apparatus used for making, cleaning, and collecting the mineral wool. Fig. 2 is a detail sectional view of one of the pans used in the manufacture of wadding.

Similar letters of reference indicate corresponding parts in all the figures.

This invention has for its object to provide means for purifying mineral wool during or after its manufacture, and for preparing it for use in the arts.

The invention consists in a new arrangement of apparatus for separating the mineral wool from the shot or sand like impurities which are usually developed during its manufacture; also in improved apparatus for receiving the wool and for compressing it into wadding; and in the new process employed for making pure wadding from mineral wool, and in the new wadding so produced.

Mineral wool is made by blowing a jet or jets of steam or air through, or by mechanically agitating, a small stream of molten scoriaceous substance, converting the latter into vitrified fine fibers, which are, however, intermixed with imperfectly separated globular matter, having the appearance of sand or shot.

These vitreous fibers possess little elasticity; they break easily while being sifted from said sand or shot, or when handled, or subjected to any kind of mechanical action.

If the receptacle into which the spray of mineral wool is propelled by the jet or device producing it is of large size, a current of sufficient strength is created to blow part of the fibers upward to the ceiling, or into recesses or shelvings remote from the direct course of the spray, which recesses or shelvings the shot, on account of its greater weight, does not reach.

The quantity of mineral wool gained in this way is, however, insignificant in comparison with the bulk of the material remaining mixed with shot. To provide a more perfect separation, I use an extra jet or jets, or currents of air or steam, or both combined, to be blown through or against the spray as it flies from the stream of scoriaceous matter, said extra jet or jets forcing the fibers into another direction than the shot.

Thus, in the drawing, the letter A represents the trough or conduit into which a stream of scoriaceous matter is allowed to flow from a suitable furnace, or from a receptacle which, after being supplied with the said matter, is removed from the furnace to or with the said trough, to discharge the scoriaceous matter in proper vicinity to the pipe B, through which a jet of air or steam is blown against the small stream of scoriaceous matter that issues from the trough or conduit A. In place of the jet B a mechanical agitator, such as described in Patent No. 180,470, may be used. C is the apartment into which the mineral wool is blown by the jet B. D is a pipe placed with such reference to the current which is produced by the jet B that it will discharge another current of air, steam, gas, or liquid against or through the spray of mineral wool thrown by the jet B. The extra lateral current D will change the direction of the mineral wool, but not materially that of the shot or sand, which is heavier than the wool. The wool will, by the current D, be carried into another compartment, E, to insure its separation from the shot, but may, if desired, be, by the current D, deposited on elevated shelves, or in elevated recesses in the apartment C, which it will also reach free from shot or globules.

In connection with, or in place of the lateral jet D, I may use an exhaust or suction apparatus placed in the compartment E, as indicated at F in Fig. 1, for drawing the fibers of wool away from the sand or shot.

As the shot is from, say, ten to a hundred fold heavier than the fibers, it is a very simple experiment to so regulate the draft currents or exhausts as to leave the shot unaffected, and merely attract or propel the fibers and conduct the same into separate receptacles or shelving, where they will settle down free from shot.

Even when the mineral wool is obtained in this manner, it cannot be made into felting or wadding in the well-known ways in which organic substances are treated for the like purpose, because the vitreous fibers break at every handling, so that when once packed in bags or cases they form lumps of different degrees of compactness, which cannot be loosened again, like cotton, or other organic fiber, to form a uniform material.

In order to make a felting from mineral wool of sufficient compactness to be wound around steam-pipes, nailed or glued to floors, or to be used in similar manner, I proceed as follows:

G are pans or vats placed or hung on shelves, floors, or ceilings, in the compartment E, where the mineral wool, free from shot, is to settle down.

I construct these pans of such length and width as the sheets of felting which I wish to obtain, and of such depth as may be requisite to contain sufficient wool to be compressed to a given thickness.

The mineral wool is caused to settle into these pans in a very loose state, so that, for instance, a heap three feet high could be easily compressed to three inches or less. In fact, it is merely a question of formula to determine the necessary contents of a pan for the required thickness or consistency of felting, and to construct the pans accordingly.

When these pans contain the requisite amount of wool, I press the wool, by means of a lid, or in any other well-known mechanical way, or the bottom *a* of the pans may be set loose, so that by reversing a pan, as in Fig. 2, the bottom *a* may serve as a lid for compressing the wool.

These various devices are obvious, the effect always being to compress the mineral wool, without previous handling, into felting or wadding, thereby preventing as much as possible the breaking, and facilitating the uniform intertwining of the vitreous fibers.

The pressing of the mineral wool may be done when the pans are more or less filled, so that the contents of a pan may be pressed, and then the process of blowing or gathering the wool in the pans continued, another pressure made, &c. In this manner I may have several compressed sheets of felting or wadding in the pans, and yet allow new or more fibers to accumulate or settle down on the material already pressed.

I claim as my invention—

1. The process herein described of separating mineral wool from globules by subjecting it to the action of a lateral current, substantially as specified.

2. In an apparatus for making mineral wool, the combination of the conduit A and jet-pipe B, with the jet-pipe D, for producing the lateral current, substantially as specified.

3. The combination of the apartment C, containing the trough or conduit A and jet-pipe B, with the compartment E, which communicates with the apartment C, substantially as herein shown and described.

4. The combination, in an apparatus for reducing slag to mineral wool, of the wool-producing mechanism, and pans G, arranged to receive the wool as it is formed, and constructed to compress the same, substantially as set forth.

5. The process described of making wadding of mineral wool, consisting in producing the fibers from the liquid slag, conducting them directly, without handling, to, and depositing them in, boxes corresponding in size to the sheets to be produced, and there compressing them, substantially as set forth.

6. As a new article of manufacture, mineral-wool wadding, formed into sheets, substantially as herein specified.

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