Sept. 29, 1931.

F. C. RUSSELL ET AL

1,825,424

PIPE INSULATION

Filed Nov. 10, 1930

2 Sheets-Sheet 1

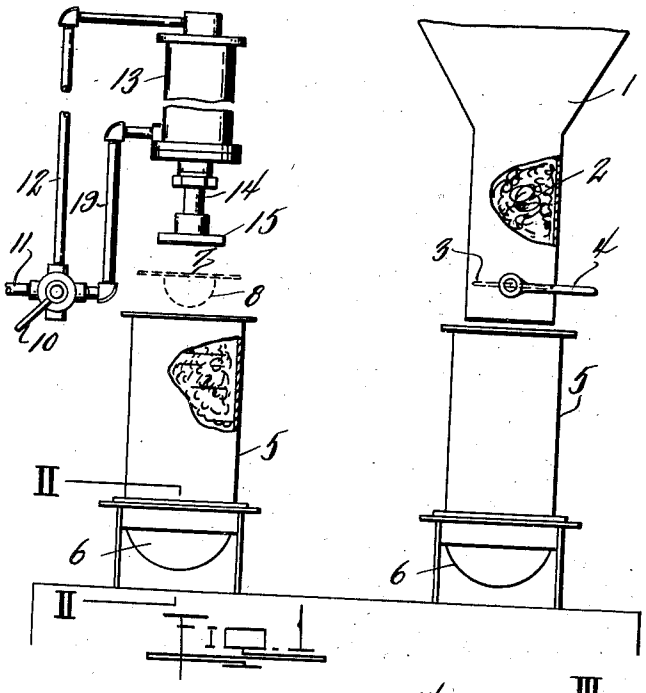


FIG. 1

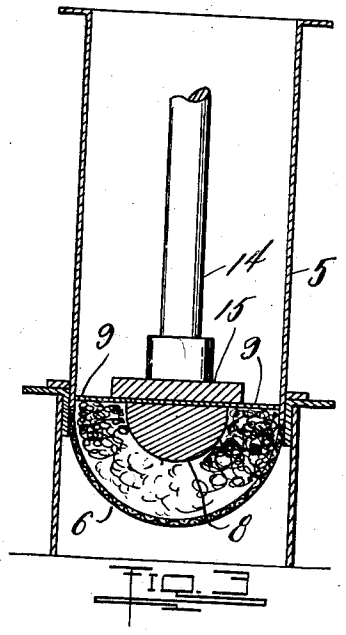


FIG. 3

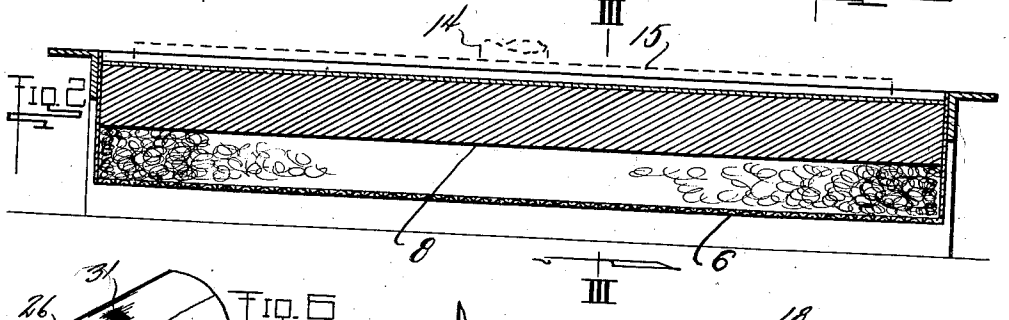


FIG. 2

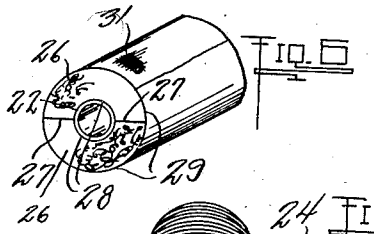


FIG. 6

FIG. 5

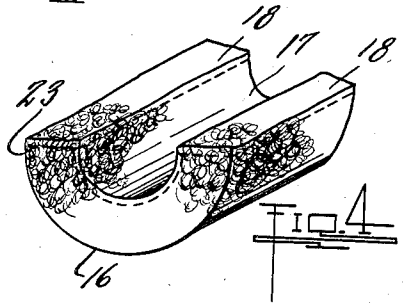


FIG. 4

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PIPE INSULATION

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FIG. 7

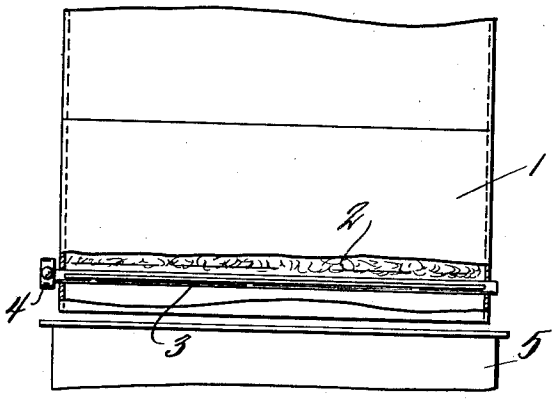


FIG. 8

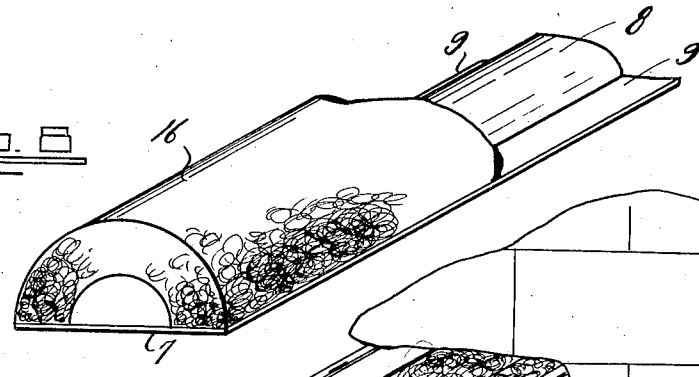
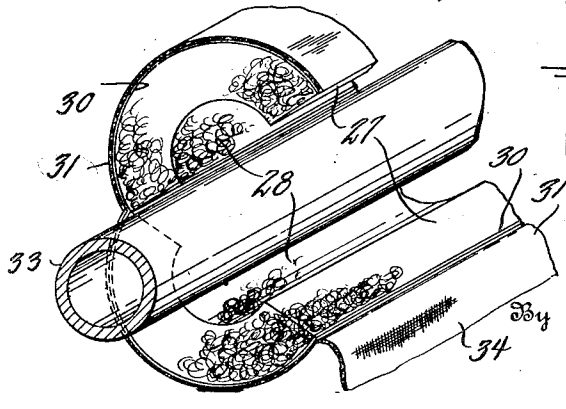


FIG. 9

FIG. 10



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UNITED STATES PATENT OFFICE

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PIPE INSULATION

Application filed November 10, 1930. Serial No. 494,547.

This invention relates to the production of forms of fibrous material.

This invention has utility when incorporated in coverings for ducts or pipes.

Referring to the drawings:

Fig. 1 is a view, with parts broken away, of an embodiment of the invention for the production of concavo-convex sections, as pipe coverings, showing the charging stage from the hopper at the right and showing draining and forming stage at the left;

Fig. 2 is a section on the line II—II Fig. 1;

Fig. 3 is a section on the line III—III Fig. 2;

Fig. 4 is a fragmentary perspective view of an article as dried and produced by the device of Fig. 1;

Fig. 5 is a view, with portions broken away, of the article of Fig. 4, going through the trimming or facing operation;

Fig. 6 is a fragmentary perspective view of the completed product hereunder;

Fig. 7 is a side view of portions of the hopper and apparatus of Fig. 1;

Fig. 8 is a view of the cast product as removed from the forming operation of Fig. 3 and supported by the core;

Fig. 9 is a view of the article in process with the core removed and its outer portion supported for drying in an oven or kiln, and

Fig. 10 is a fragmentary view of applying the product to a pipe.

Hopper 1 is shown as a supply for fibrous material 2, as mineral or rock wool, suspended in a medium, as water, to maintain a general uniform distribution of the fiber.

Valve 3 from hopper 1 may be opened by handle 4 and thus, through approximately the total maximum horizontal extent, direct gravity discharge of the fibrous material from the hopper 1 into sleeve 5, suspended over former 6, shown as foraminous, and in providing a direct drainage from the fiber for the medium in which the fiber 2 is in suspension. From this charging stage, relative shifting is effected between the hopper 1 and the sleeve 5 with the former 7 into position to receive former element 7 including semi-circular pipe seat section 8 and wings 9 therefrom. This former element 7, introduced into the upper portion of the sleeve 5, may be caused to descend therein even beyond the action of gravity on this former. To this end, valve 10 may be operated to conduct power fluid from supply line 11 into line 12, connected to the upper end of power cylinder 13 to drive piston 14 in a descending stroke with its terminal plate 15 against the former 7, in power depressing operation. This means that the former 7 completely traverses the sleeve 5 into the former 6 and, as the medium drains through the former 6 foraminous portion, the fibrous material 2 is knit together or felted into the semi-pipe section form of casting having convex outer side 16 and concave inner side 17 with faces 18 therefrom. The piston 14 may have recover stroke effected by shifting the valve 10 for power fluid to act through line 19 to the lower portion of the cylinder 13, while exhaust from the line 12 occurs at the valve 10.

The article in the completed mold 6, 7, may now be oriented to be supported by the element 7 and the former portion 6 removed. In lieu thereof, imperforate form 20 is placed thereon and the article oriented to have the concave side upward. The element 7 is then removed and the article inserted in an oven or kiln 21 for the drying operation. During this drying operation the imperforate form 20 may serve as a supporting shell and hold the article in shape.

After this drying operation, the article, preferably over-size as to the finished product, is brought to support 22 with the form 20 removed.

This support 22 may serve as a movable cradle and oversize, indicated by dotted lines 23 (Fig. 4), may be removed by rotary member or miller device 24 operated by motor 25. The miller or cutter device 24 running at high-speed is made up of elements conforming to the finished contour. For varying sizes of pipes, only the intermediate convex portion of the rotary cutter need be substituted. Section 26 as thus produced has a finished inner portion or

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abutting face 27, and pipe seat portion 28, with unfinished outer portion 29.

In getting the product into merchantable final shape, a jacket is provided, not only for handling, but as a means for ready cover assembly. In this resisting of attack, such may even go to the extent of providing water-proof coat 30 of water-proof paper inside, with an outside jacket 31 of cheese cloth. A paper tube 32, of the pipe exterior diameter, also serves as a stiffening core as well as a protection for the insulation until it is ready for applying to pipe 33 by opening up and then repasting flap 34.

To facilitate beyond the felting holding of the mass to form, a binder may be used having attributes of moisture or water-proofing, or even of fireproofing. It has been found advantageous to include in the binder colloidal clay, such as Bentonite. Furthermore effective binding action has been had by a material reduction in the binder permitted when African asbestos fiber has been used up to one pound of the asbestos to twenty pounds of the mineral wool. This fiber is included in the hopper to be mixed at the picking stage, while the binder is included with the liquid and fiber at the getting of the mass into suspension. In imparting waterproofing properties, bituminous agents have been employed, such as asphaltic compositions.

What is claimed and it is desired to secure by Letters Patent is:

1. In the forming of concavo-convex sections, supplying fibrous material for the body in a suspension medium, draining the medium therefrom while mechanically expediting the taking of form for the body by changing upper surface form in departing from gravity level contour, drying said formed section, trimming and jacketing.

2. In the forming of concavo-convex sections, supplying fibrous material for a body in a suspension medium, draining the medium therefrom while mechanically expediting the taking of form in departing from gravity level contour, drying said formed section, trimming section abutting portions, and jacketing other portions.

3. In the forming of concavo-convex sections, supplying fibrous material for the body in suspension medium, draining the medium therefrom while mechanically expediting the taking of form in departing from gravity level contour, drying said formed section, facing-off inner portions, and jacketing outer portions.

4. A felted mineral wool molded pipe covering section, and a jacket therefor embodying paper and fabric.

5. A felted mineral wool molded pipe covering section embodying water-proof paper and cloth over said paper.

6. A felted mineral wool molded pipe covering section provided with a waterproof binder therein, and a jacket for the section embodying paper and fabric.

In witness whereof we affix our signatures.

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CLINTON L. SAVIDGE.