R. P. PERRY.

CONDUIT.

APPLICATION FILED AUG. 26, 1918.

1,382,740. Patented June 28, 1921.

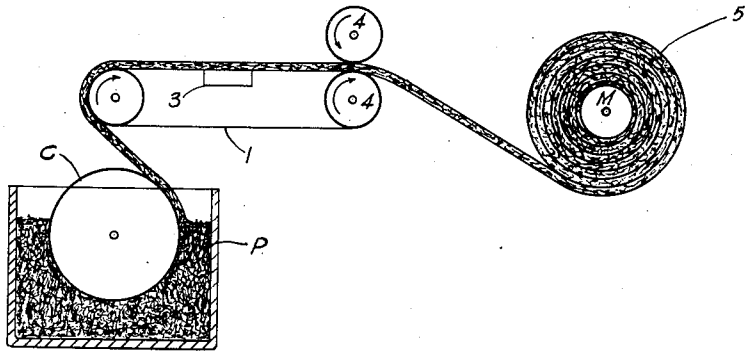


Fig. 1

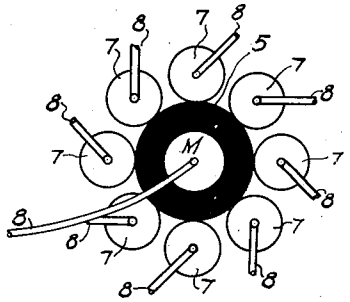


Fig. 2.

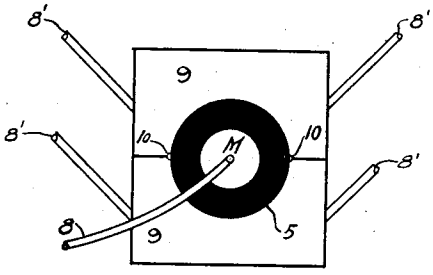


Fig. 3.

INVENTOR

Ray P. Perry

BY

Chas. W. Mortimer

ATTORNEY

UNITED STATES PATENT OFFICE.

RAY P. PERRY, OF UPPER MONTCLAIR, NEW JERSEY, ASSIGNOR TO THE BARRETT COMPANY, A CORPORATION OF NEW JERSEY.

CONDUIT.

1,382,740. Specification of Letters Patent. Patented June 28, 1921.

Application filed August 26, 1918. Serial No. 251,536.

To all whom it may concern:

Be it known that I, RAY P. PERRY, a citizen of the United States, residing at Upper Montclair, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Conduits, of which the following is a specification.

This invention relates to the process of producing conduits or hollow articles and the products thereby obtained.

The object of the invention is to produce a conduit containing mixed fibrous and waterproofing materials which is substantially homogeneous and impervious to water, which shall possess good wearing qualities and a considerable degree of strength and rigidity, and which shall be capable of being cut into various lengths to be used for different purposes.

In practising this invention a quantity of comminuted waterproofing material such as pitch, asphalt, resin, etc., may be mixed with a watery pulp of fibrous material and this mixture formed into a sheet upon an ordinary felt or paper-making machine. After the sheet has been formed and partially or entirely freed from water, it may be wound upon a mandrel, for example, to form a hollow cylinder having a wall of the desired thickness which thickness will depend upon the thickness of the sheet and the number of convolutions. After the cylinder is formed, it is subjected to high heat and pressure whereby the successive convolutions are intimately joined together thus forming a hard and densified product. The union of the convolutions is greatly promoted by the particles of waterproofing material which become fused by the heat and effectively cause them to become intimately united. The fibrous material distributed throughout the sheet serves to give more strength and rigidity to the product than could be obtained by using fibrous or waterproofing material alone.

The invention will be readily understood by reference to the accompanying drawings in which,

Figure 1 is a view showing the sheet coming from a paper-making machine and being wound up;

Fig. 2 is a view showing how the cylinder may be heated and compressed; and

Fig. 3 is a view showing another way of heating and compressing the cylinder.

In the drawings, reference character 1 designates the usual "wet blanket" of an ordinary paper-making machine.

Carried along this blanket 1 is the sheet 2 of material which has preferably been formed on the cylinder C of the paper-making machine P. The sheet 2 is formed by mixing the desired proportions of fibrous and comminuted waterproofing materials in a suitable beater, introducing a water pulp of the same into the paper-making machine where it is formed into a sheet on the cylinder C and passes out along the blanket 1 as indicated. Any other suitable means may be used for forming the sheet, the paper-making machine being indicated merely for illustrative purposes. The amount of waterproofing material may vary from 50% to 90% or more of the weight of the water free content of the finished material, and will preferably be introduced in the form of filaments or shot when an ordinary paper-making machine is used.

The sheet 2 passes over the suction box 3 where a portion of the water is extracted, and then passes between the rollers 4 where more of the water is squeezed out. From the squeeze rolls 4 the partially dried sheet 2 may be wound up into a cylinder 5 upon a mandrel M, or formed into a cylinder in any other convenient manner so that the successive convolutions are in contact with each other. When a sufficient number of turns have been taken to produce a cylinder 5 having the desired thickness, the sheet 2 is severed and the cylinder 5 is dried and then subjected to heat and pressure which serves to fuse or melt the waterproofing material so that the convolutions become joined together and the material becomes greatly densified.

Different means may be used for heating and compressing the cylinder 5 to densify the same and unite the convolutions. The ones shown in Figs. 2 and 3 are for illustrative purposes.

In Fig. 2, the cylinder 5 upon the mandrel 6 is shown surrounded by a number of pressure rollers 7 which cause the layers to become united to produce a substantially homogeneous cylinder. The mandrel M and rollers 7 may be heated by heating means indicated at 8, and the mandrel M will be of such strength as to sustain the compressive force of the pressure rollers 7, as the cylin-

der 5 is heated and pressed while being revolved.

In Fig. 3 the cylinder 5 on the mandrel M is shown as being compressed between two properly shaped pressure blocks 9, 9, which may be heated by the heating means 8'. If burs or ribs are formed on the cylinder 5 where the blocks come together at 10, they may be easily removed in any convenient manner after the heating and pressing operation is completed.

Many modifications of the details of the invention will suggest themselves to those skilled in the art. The sheet 2 may be made only a few hundredths of an inch thick, and few or many convolutions may be used for the cylinder 5; the sheet 2 may be made of different widths to form cylinders of different lengths; the diameter of the mandrel M may be varied through a very wide range so as to produce cylinders of different sizes; mandrels of different shapes such as square, rectangular, etc., may be used and may be made to bulge out in the middle so as to produce hollow articles somewhat in the shape of barrels, as the sheet 2 will conform closely to the outline of the mandrel upon which it is wound; the beginning and end of a sheet 2 which forms the cylinder 5 may have a larger proportion of waterproofing material than the middle portion, thus producing a cylinder having a smaller proportion of waterproofing material in the interior than near the inner or outer surface; the water may be entirely or substantially entirely dried out of the sheet 2 before it is wound up, or the sheet 2 may be wound up in a wet or damp state; and additional waterproofing material in liquid or comminuted form may be applied to the surface of the sheet 2 as it is being wound up.

Some of the essential differences between this invention and that disclosed in my copending application Serial No. 194,775 filed October 4, 1917, are that I use heat and pressure in this case to unite the layers intimately and do not find it necessary to saturate the finished article with liquid waterproofing material.

Where the term "cylinder" is used in the specification and claims it is intended to include bodies which have circular as well as other shapes in cross-section, and also bodies whose diameters may be the same or may vary considerably in different portions.

Claims:

1. As a new article of manufacture, a hollow cylinder containing mixed fibrous and waterproofing materials which have been sufficiently densified by heat and pressure to produce a substantially homogeneous and rigid product.

2. As a new article of manufacture, a rigid cylinder containing fibrous and waterproofing materials, the waterproofing material being in excess of the fibrous material, said cylinder having been densified by high heat and pressure.

3. As a new article of manufacture, a rigid cylindrical body comprising layers of mixed fibrous and waterproofing materials which have been intimately united by heat and pressure so as to produce a substantially homogeneous product.

4. As an article of manufacture, a hollow cylinder comprising a plurality of layers of fibrous and waterproofing materials in substantially the proportions of one to three, which have become intimately united with each other by heat and pressure.

5. As an article of manufacture, a hollow cylinder composed of a plurality of sheets which have been intimately united by heat and pressure to produce a substantially homogeneous product, said sheets containing a felted mass of fibrous material and bituminous material in excess of the fibrous material.

6. The herein described process of producing a hollow cylinder which comprises the steps of forming a sheet of mixed fibrous and comminuted waterproofing material, winding said sheet into a roll, and subjecting said roll to heat and pressure so that the bituminous material becomes fused and the convolutions firmly united.

7. The herein described process of producing a hollow cylinder, which comprises the steps of forming a sheet of mixed fibrous and comminuted waterproofing materials, winding said sheet into a roll, and heating and pressing said roll to unite the convolutions.

8. The herein described process of producing a hollow cylinder which comprises the steps of providing fibrous material, mixing therewith more comminuted bituminous material than the weight of the fibrous material, forming a sheet of the mixture, winding said sheet into a roll, and heating and pressing said roll to unite the convolutions.

9. The herein described process of producing a hollow cylinder which comprises the steps of forming a sheet of mixed fibrous and comminuted bituminous materials, having a larger proportion of bituminous material than fibrous material, winding said sheet to form a cylinder, and subjecting said cylinder to high heat and pressure.

10. The herein described process of producing a hollow cylinder which comprises the steps of forming a thin sheet of mixed fibrous material and comminuted pitch, winding said sheet to form a cylinder, heating and pressing said cylinder so that the pitch becomes fused and the convolutions united.

11. The herein described process of producing a hollow cylinder which comprises the steps of forming a sheet of mixed fibrous

and comminuted waterproofing materials on a paper-making machine, winding said sheet upon a mandrel, and subjecting said wound sheet to heat and pressure so that the bituminous material becomes fused and the convolutions firmly united.

12. The herein described process of producing a hollow cylinder which comprises the steps of forming, as a moist sheet, a layer of mixed fibers and comminuted waterproofing materials, winding said sheet into a roll and drying, heating and pressing said roll to unite the convolutions.

13. The herein described process of producing a hollow cylinder which comprises the steps of forming a sheet of mixed fibers and comminuted waterproofing materials, winding said sheet upon a mandrel, and subjecting said wound sheet to heat and pressure so as to make the mass substantially homogeneous throughout.

14. The herein described process of producing a hollow cylinder which comprises the steps of forming a sheet of paper-making fibers and comminuted pitch, winding said sheet to form a cylinder, and subjecting said cylinder to heat and pressure so that the pitch becomes fused and the convolutions become united.

In testimony whereof I affix my signature.

RAY P. PERRY.