

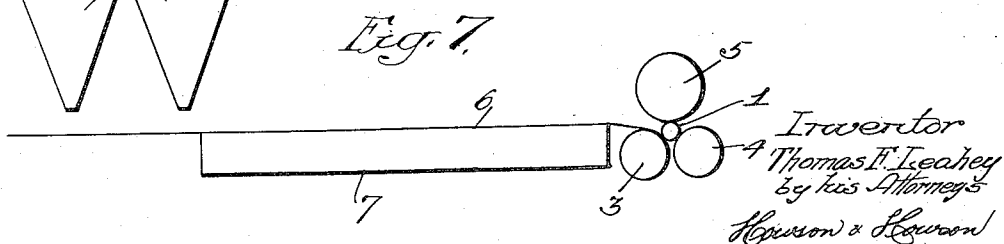
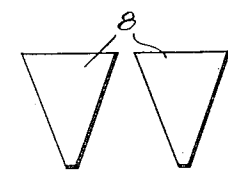
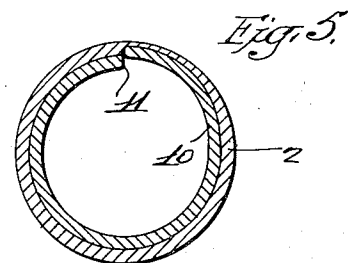
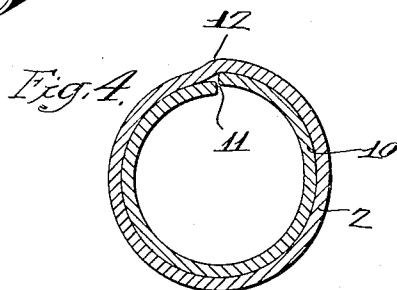
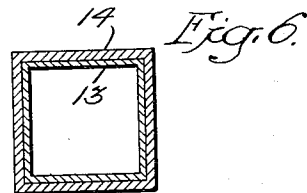
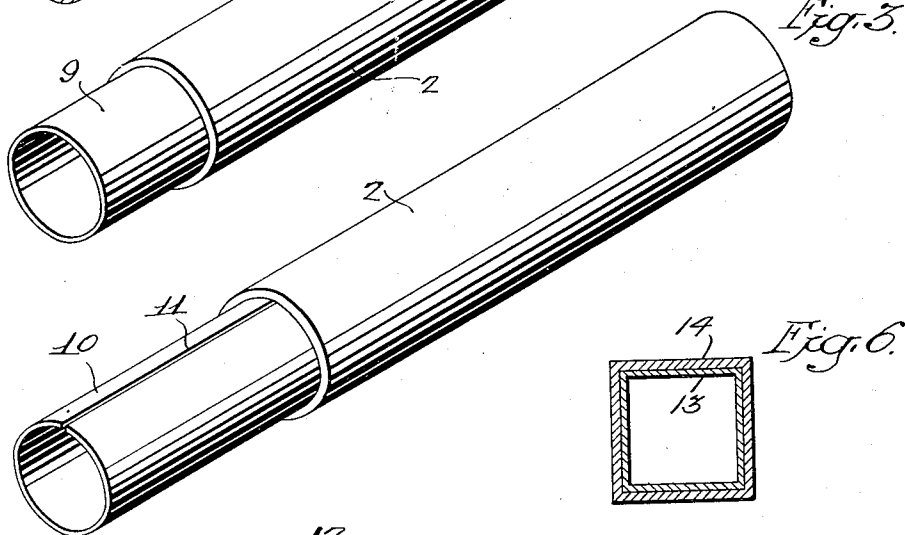
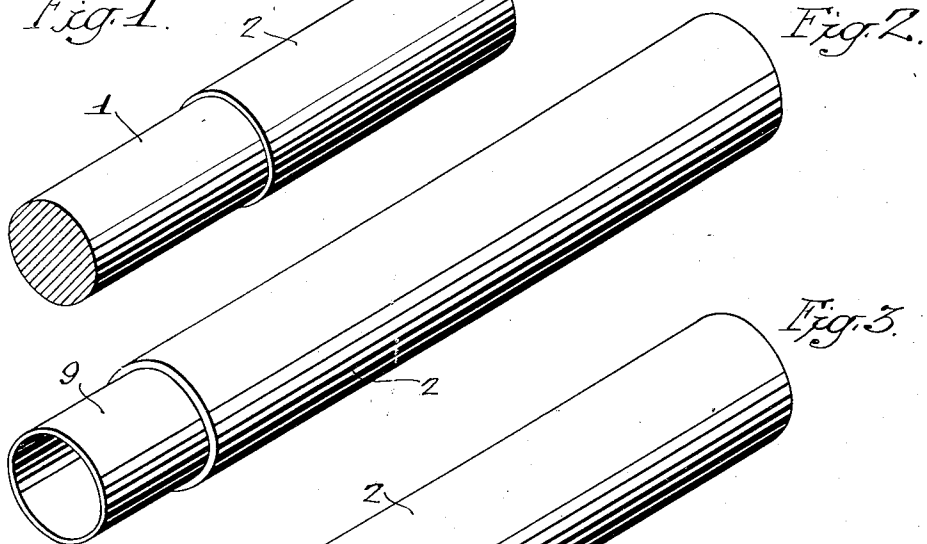
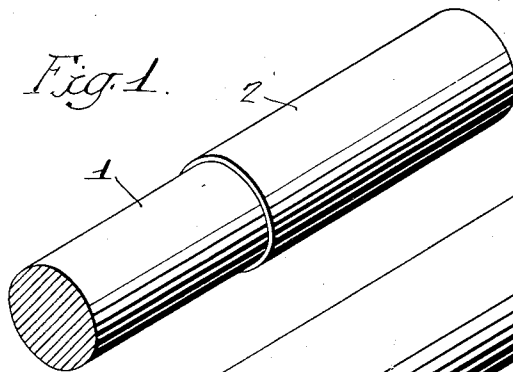
Sept. 26, 1933.

T. F. LEAHEY

1,927,985

DECORATIVE ARTICLE

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UNITED STATES PATENT OFFICE

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DECORATIVE ARTICLE

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3 Claims. (Cl. 41—17)

This invention relates to decorative articles, particularly articles in the form of rods and tubes, which articles when constructed in accordance with the principles of the invention are capable of a wide variety of use.

An object of the invention is to provide a durable, decorative article in the form of a rod or tube which is simple in construction and may be economically manufactured. In the case of a tube, an air and water proof article is obtained which enhances the value of the invention by extending its use to instances where a decorative conduit, such as a water pipe, is desired.

Another object of the invention is to provide a decorative article comprising a decorative coating or covering on a metallic base member or core, thereby simulating the plating of metallic surfaces with attractive and permanent finishes. The invention provides a suitable substitute for the usual plating operations such as chromium plating. Contrasted with plated articles, however, the present article involves no expensive plating operation, may be manufactured at low costs, and is an attractive article which will not rust or corrode, even under moderate acid concentrations.

Objects and features of the invention in addition to those already stated will appear hereinafter. The rod or tubing contemplated by the invention comprises essentially a metallic rod or tube coated with fibrous sheet material impregnated with synthetic resin and coloring matter. Any one of the synthetic resins may be employed, for example, the phenolic condensation products, the polyhydric alcohol-polybasic reaction products, the resins obtained from the reaction of urea and formaldehyde, amine-aldehyde condensation products, etc. Of these, the phenolic condensation products, such as phenol-formaldehyde, phenol-glycerine, phenol-carbohydrate, and phenol-furfural resins appear to be preferable since they exist in two stages known as the initial stage and the final stage. In the initial stage, the resin is fusible and soluble in alcohol, acetone, etc., and is capable of being transformed by heat alone or by heat and pressure into the final stage in which the resin is infusible and insoluble in organic solvents. Any suitable pigments or dyes either organic or inorganic which will not deleteriously affect the resin may be employed as the coloring matter. White pigments may be employed if desired and hereinafter throughout the specification and claims, the term "colored" includes "white". The fibrous sheet material is preferably paper but other suitable

fibrous sheet material such as woven cloth or asbestos may be used, if desired. The article of the invention may be obtained by means of any of several suitable processes, examples of which are fully set forth hereinafter.

Reference may be had to the accompanying disclosure and the following detailed description for a complete understanding of the invention. The drawing illustrates various forms which an articles made in accordance with the invention may take.

In the drawing:

Fig. 1 is a perspective view of a rod made in accordance with the invention, such article comprising a central metallic rod;

Fig. 2 is a similar view of a modified form of the desired article which utilizes a seamless tube as the central member and which constitutes a very desirable tube or conduit;

Fig. 3 is a view of another modified form of the article wherein a seamed or butt tube is utilized as the central member;

Figs. 4 and 5 are sectional views illustrating the formation of the article from a cheaply constructed central tube, whose edges do not perfectly abut;

Fig. 6 is a sectional view of a modified form of article which takes the form of a square tube or conduit; and

Fig. 7 is a schematic illustration of a process by which the article of the invention may be advantageously obtained.

Referring to the drawing, there is illustrated in Fig. 1 a rod made in accordance with the invention which comprises a central metallic rod 1 coated with a suitable covering 2. In accordance with the invention, this covering comprises a fibrous sheet material, such as paper, impregnated with a mixture of synthetic resin and coloring matter. While the invention contemplates the manufacture of the desired article by any suitable process, one preferred process for producing the article is as follows, reference being had to the schematic illustration of Fig. 7.

The central base member, which in the article of Fig. 1 takes the form of a metal rod, is placed in a suitable compressing machine designed to receive the rod between the compressing rolls 3, 4 and 5 thereof, and to rotate the rod. During such rotation, cotton or kraft paper (unsized) 6 is drawn across a hot plate 7 and heated. A quantity of synthetic resin, preferably a phenol-formaldehyde resin, in its initial stage in powdered form is spread over the paper as it passes over the hot plate. The resin preferably has

mixed with it a pigment or dye, such as an aniline color or an inorganic pigment and the mixture is fed from one or more hoppers 8 onto the paper. Any pigments or dye may be used which

5 will give the desired result.

As it passes over the hot plate, the resin melts and the paper is consequently impregnated with the mixture of resin and coloring matter. Due to the fact that the paper passes under the base member upon which it is wound in the machine as illustrated, a pool of liquefied resin collects on the paper which aids in the impregnation. The paper is then wound on the metallic rod under tension, which together with the pressure of the pressing roll 5 serves to compact the layers of paper against the rod and to unite the contacting layer therewith and the individual layers with each other. The pressure of the roll 5 may vary considerably, although I have found that a pressure of ten pounds per linear inch is satisfactory. After the rod has been wound with the necessary numbers of plies of paper to obtain the desired thickness, the composite structure is removed from the machine and placed in a suitable oven where it is baked at a temperature of 250 to 260° F. for about one to two hours. This heating serves to convert the phenol-formaldehyde resin into the final, infusible, insoluble stage and to homogenize the impregnated fibrous sheet material into a uniform compact body firmly bound upon the supporting rod.

If desired, mottled, blended or multi-color colored effects may be obtained by mixing two or more colored pigments or dyes with the resin prior to its addition to the paper on the hot plate. Preferably, when it is desired to obtain a mottled or multi-colored effect, a portion of the surface of the paper prior to its passage over the hot plate or as it passes thereover may be brought into contact with a resin containing a dye or pigment of a given shade, while the remaining portion of the surface is brought into contact with a resin or resins differently colored. It will thus be seen that the fibrous sheet material may be colored in any desired manner by employing the necessary number of colored resins and disposing them in suitable positions on the paper sheet. Hoppers 8 suitably disposed above the sheet of fibrous material may, as illustrated in Fig. 7, be employed to bring the colored resins onto the paper at the predetermined places to effect the desired results. This is an important feature of the invention, since it enables the procurement of various colored combinations and schemes in the applications of the article to be described later. It will be understood, of course, that Fig. 7 is merely schematic and that the hoppers may be disposed directly over the hot plate or in any other position that proves desirable.

It is also important to note that no lubricant is used on the rod, and therefore, a very firm union is obtained between the metal and the impregnated fibrous covering. As an illustration of the firm bondage between the component elements of the finished rod, reference is made to a test in which a galvanized metal was covered with impregnated paper as described above and the structure was subjected to sufficient force to separate the paper coating from the base member. Such test resulted in the removal of the galvanizing metal with the resin-impregnated paper coating, clearly showing the tenacious bond existing between the respective elements of an article formed in accordance with the invention.

After the baking of the rod, as set forth above is completed, the outside covering may be ground to obtain the desired diameter and to obtain a uniform cylindrical surface. Such grinding will, of course, remove any unevenness resulting from the previous wrapping of the paper on the rod. After the grinding operation, the composite rod may be polished with or without rouge. It is important to note that since the paper is thoroughly impregnated with coloring matter, an even distribution of such matter throughout the fibrous tissues is obtained and the desired surface coloring is had regardless of the amount of grinding.

While I have set forth one process of making the article of the invention, it is to be understood that various modifications in such a process may be used. For example, the product may be made of paper or other fibrous sheet material which has been colored by the incorporation of suitable pigments with the stock, or which has been dyed, prior to the resin application. The resin may be colorless, or it may be of the same color as the paper. It may also be of a different color than the colored paper, in which case mottled or multi-color effects are possible by the use of colorless and colored resins, or by the use of two or more differently colored resins.

Instead of using the powdered resin as described, the fibrous sheet material may be placed in or passed through liquid synthetic resin, or synthetic resin varnish. In such case, of course, the use of a hot plate is unnecessary. The liquid resin or resin varnish may be suitably dyed or colored by the addition of appropriate pigments or dyes. One method which has proved applicable involves the addition of a white pigment such as titanium oxide together with a dye soluble in the varnish. These are mixed with a synthetic resin varnish in a ball mill, for example, until a homogeneous colored product is obtained. Other white pigments may be employed in place of the titanium oxide and the white varnish itself may be used to impregnate the paper, or it may be suitably dyed. The tubes or rods are wound on the base members in the manner hereinbefore described in connection with the process involving the use of the powdered resin. The tubes or rods are then subjected to sufficient heat for a sufficient length of time to convert the fusible soluble synthetic resin into the infusible insoluble stage.

In finishing the tubes manufactured with the powdered resin or the liquid resin, or the synthetic resin varnish, they may be further treated after buffing by spraying or dipping them in colorless or colored varnish. After the spraying or dipping, the tubes or rods are then dried and subjected to sufficient heat for a sufficient length of time to convert the resin at the surface into the infusible insoluble form. They then may again be buffed. The spraying or dipping step provides a surface of synthetic resin which adheres tenaciously to the fibrous colored rod or tube, and may be easily buffed to produce a highly polished and extremely glossy surface.

Furthermore, various modifying agents, such as softeners, plasticizers and fillers, may be incorporated in the resin. The structure of the article itself may also be changed and instead of using paper, cloth, such as muslin or duck may be employed. Asbestos paper or cloth is also suitably adapted for use in the article.

Referring again to the drawing, Fig. 2 illustrates a modified form of the article wherein a central metallic tube 9 takes the place of the rod

of Fig. 1. Tube 9 is a metallic seamless tube to which the covering is applied in the same manner as has already been described in connection with the rod of Fig. 1. Fig. 3 discloses a similar form of the article in which, however, the central tube 10 is a seamed or butt tube having a longitudinal seam 11 therein. This form of the invention is particularly advantageous in that it can be very economically manufactured. The central tube 10 may be rolled from low priced sheet metal into the desired tubular form, leaving the seam unwelded or open. Thereafter, the outer covering may be applied in the manner previously described. Since the covering adheres so tenaciously to the tube and is completely air and water tight, the resulting article is substantially as satisfactory and capable of the same use as the tube of Fig. 2, wherein the more expensive seamless tube is used. It is further to be noted that the use of a seamed tube does not materially detract from the strength of the article and prevent its use as a suitable conduit for water or the like.

Figs. 4 and 5 illustrate the use of a seamed or butt tube which has been rolled into the approximate desired tubular form without taking the necessary care and provision to bring the edges of the tube into abutting relation. Such tube is shown in Fig. 4 after the outer covering has been applied in the above-described manner. Due to the non-abutting relation of the edges of the seam, the circumferential surface of the composite structure is not uniformly cylindrical and a rise in the surface, as illustrated at 12, results. Fig. 5 illustrates the same composite structure after the outer covering has been suitably ground to obtain an even cylindrical surface having the desired diameter. It will be noted that this finished article is as satisfactory from the standpoint of both external appearance and use as are the previously described modifications wherein a symmetrical inner tube is utilized. This modification of the composite tube of the invention is deemed to be of utmost importance since it may be very economically manufactured and is satisfactory from every standpoint.

In Fig. 6, there is disclosed a modified form of tube in which a square tube 13 is used as the central member and is covered by a covering 14 necessarily of square cross section. The process of manufacturing this modified form of tube is substantially the same as previously described or any modification of such process may be used. This modified form of tube shows clearly that the article contemplated by the invention may take any shape or form. For example, the inner member may be rectangular, hexagonal, octagonal, etc. or it may be in the form of a tapering rod or tube where the circumference gradually becomes less from one end to the other.

The article contemplated by the invention is capable of many uses. In the form of a tube, it may be used as a pipe or pipe housing. In

any of its forms, it may be used in the construction of towel racks, railings, flash light cases, handles or other parts of vacuum cleaners, and lamp stands. The surface of the product is indestructible and the outer coating has highly desirable insulation characteristics both as to heat and electricity. Consequently, the article is particularly adapted for use in railings or as water pipes and will not impart a cold feeling to the hands in the one instance and will prevent conduction of heat to or from the water in the other instance. The coloring is permanent and homogenous throughout the thickness of the outer layer or covering and therefore such covering may be threaded or cut in any desired manner. The article is stronger than ordinary resin-impregnated tubes due to the presence of the metal base or core member as a component part of the article. It is possible to obtain various desired color combinations and schemes with the article. For example, if in a bathroom it is desired to have the water pipes, towel racks, etc. of the same or blending colors, it may be readily done by utilizing the article of the invention in its various forms properly colored.

The above advantages and characteristics of the improved product are merely illustrative and many other advantages and features will occur to persons skilled in the art. Various modifications and changes may, of course, be made in both the article and process for forming the same without departing from the spirit or scope of the invention. The appended claims define the breadth of the invention and it is to be understood that no other limitations are to be imposed thereon.

I claim:

1. A decorative multi-colored article comprising a metallic member having a covering of colored synthetic resin-impregnated fibrous sheet material firmly united thereto, the synthetic resin-impregnated fibrous sheet material being differently colored at different portions at the surface thereof, the said coloring extending a substantial distance below the outer surface of the covering.

2. A decorative article comprising a metallic member having a covering of colored synthetic resin-impregnated fibrous sheet material firmly united thereto, and an outer coating of highly polished synthetic resin firmly united to the synthetic resin-impregnated fibrous material.

3. A decorative article comprising a metallic seamed tube having non-abutting seam edges, a covering of colored synthetic resin-impregnated paper firmly united to said tube, said covering having an even cylindrical outer surface, and an outer coating of highly polished synthetic resin firmly united to the synthetic resin-impregnated fibrous material.

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