No. 633,306. Patented Sept. 19, 1899.

C. F. CHURCH.

PROCESS OF PROVIDING VEHICLE FRAMES OR THE LIKE WITH PROTECTED SURFACES.

(Application filed Oct. 4, 1897.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1

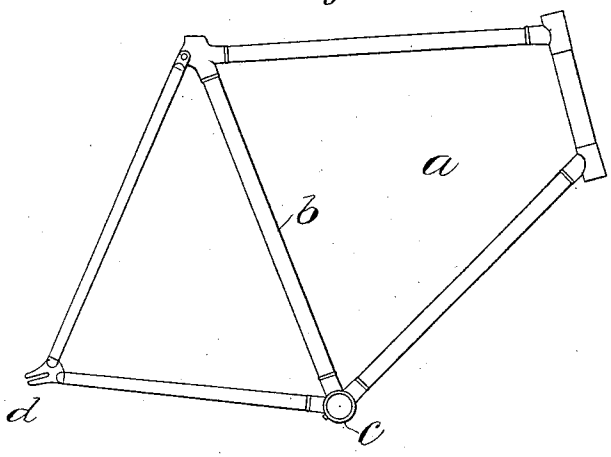


Fig. 2

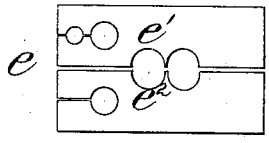


Fig. 3.

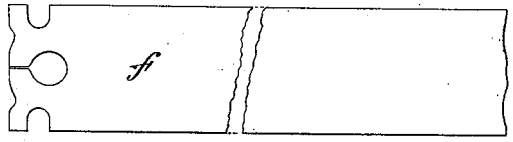


Fig. 4

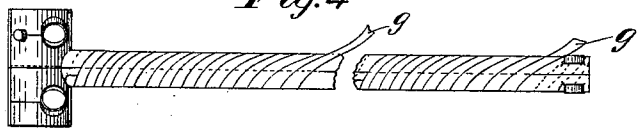


Fig. 5

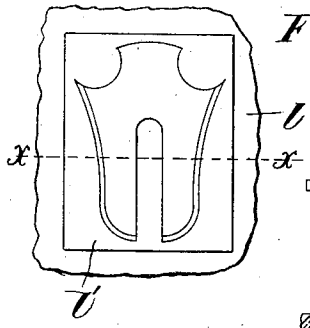


Fig. 8

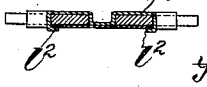


Fig. 6

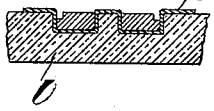
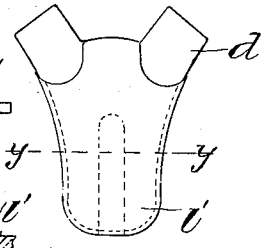


Fig. 7



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Fig. 9

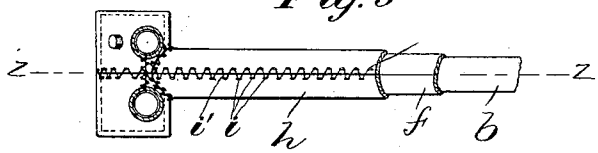


Fig. 10

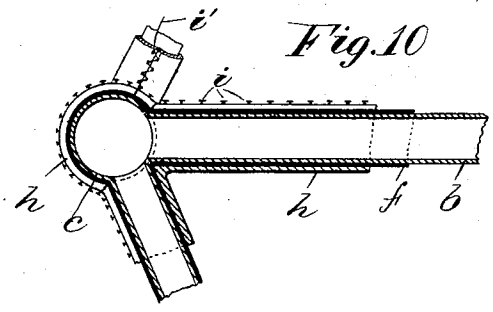
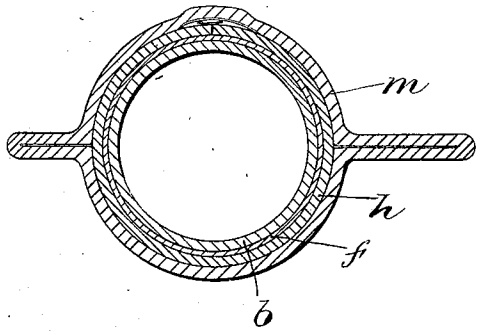


Fig. 11



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UNITED STATES PATENT OFFICE.

CHARLES F. CHURCH, OF NEWARK, NEW JERSEY.

PROCESS OF PROVIDING VEHICLE-FRAMES OR THE LIKE WITH PROTECTED SURFACES.

SPECIFICATION forming part of Letters Patent No. 633,306, dated September 19, 1899.

Application filed October 4, 1897. Serial No. 653,996. (No specimens.)

To all whom it may concern:

Be it known that I, CHARLES F. CHURCH, a citizen of the United States, and a resident of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Processes of Providing Vehicle-Frames or the Like with Protected Surfaces, of which the following is a full, clear, and exact description, whereby any one skilled in the art can make and use the same.

My invention relates to the manufacture of articles with a protecting surface layer of thin material which is impervious to moisture and will form to a considerable degree a protection against the action of the weather under exposed conditions of use; and the object of my invention is more particularly to provide a vehicle-frame of which the main and separable parts and also attachments thereto shall be provided with this protecting surface layer.

To this end my invention consists in a process of providing a vehicle-frame and its connected parts to a greater or less degree with a protecting layer of celluloid or like material formed to shape and secured in place by the action of heat and pressure, as hereinafter described, and more particularly pointed out in the claim.

Referring to the drawings, Figure 1 is a view in side elevation of a bicycle-frame of a well-known general form. Fig. 2 is a plan view of a development of a blank-covering for the crank hanger or bracket on enlarged scale. Fig. 3 is a plan view, on enlarged scale, of a development of a blank-covering for the down-tube of the frame. Fig. 4 is a view of the main tube and connected crank hanger or bracket, showing manner of forming a covering-film to shape. Fig. 5 is a plan view of the die used in forming the toe-piece cover, showing the forming-die, matrix, and the film in place to be cut. Fig. 6 is a view in cross-section through the part shown in Fig. 5 on plane denoted by the line $x\,x$. Fig. 7 is a plan view of the toe-piece, showing the film in place. Fig. 8 is a view in cross-section through the part shown in Fig. 7 on plane denoted by the line $y\,y$. Fig. 9 is a detail view of the lower end of the down-tube, showing how the shield is applied and held in place by a lacing. Fig. 10 is a view in central section of the parts shown in Fig. 9 on plane denoted by the line $z\,z$. Fig. 11 is a view in cross-section, on enlarged scale, through the down-tube with the film and shield in place in a bag, as in the process of applying heat and pressure.

In the accompanying drawings my invention is illustrated in connection with a bicycle-frame, which is usually made of steel or like metal, and after the several parts are secured together provided with a covering layer or finish of enamel, which is vulcanized on.

A main object of my improvement is to avoid the use of enamel and to provide a substitute therefor which is capable of a more extended use and has marked advantages in availability as to color, durability, and adaptability as compared with any previous surface coating.

In the accompanying drawings the letter a denotes the frame of a vehicle, which may be composed of a number of members, such as main frame members and bracket members, secured to each other in the process of manufacture or separably united by connecting means which enable the parts to be detached whenever required. Of this frame the down-tube b, the crank hanger or bracket c, and the toe-piece d have been selected to illustrate the manner of carrying out the invention.

The covering layer used by me in the practice of my invention is a thin film of celluloid or like material capable of being readily bent and to a degree plastic when heated. This material is an article of common manufacture that may be obtained on the market.

To cover the down-tube b, a strip of material of proper length and width to envelop it with a slight lap is provided, and this strip is wrapped about the tube and held thereon by means of a tape g, of flexible material, as india-rubber, as illustrated in Fig. 4 of the drawings. The crank-hanger blank e is cut to shape in sections e' e^2, with indentations or openings for the passage of lugs or projections on the bracket, and this cover is bound upon the crank-hanger in like manner as described with reference to the tube. After the tube and bracket covers have been heated and then cooled they are set to shape and clasped closely about the parts on which they were molded. While thus clasped upon the

parts a shield h, of flexible and elastic material, as india-rubber, is placed about the part so as to closely enfold it, and this shield is held in place by means of a lacing i', passing around the lacing-studs i, the tape g having been removed before applying this shield. In this condition the parts are placed in an air-tight rubber bag m and the air exhausted. This bag is then placed in a retort, which is filled with water heated in any convenient manner, as by the application of steam heat, and subjected to pressure, as by means of a pump connected with the retort by piping. After this article has been subjected to heat and pressure for a desired length of time it is removed from the retort, (either having been cooled by the application of cold water before being taken out or afterward,) and the article will then be found to have this covering-film or protective layer firmly and intimately united to the surface, which it may cover to any desired extent, either wholly or in part.

It is to be understood that the article with the covering-film of celluloid or like material, when bound with the tape and put into hot water, is first inclosed within an air-tight bag m, from which the air is exhausted, so that the blank is formed by the application of heat and of pressure in a similar manner, although to a less degree, as in the case of the final molding and securing of the covering layer to the parts while in the retort.

It has been found advantageous to make use of a layer of adhesive material, as cement, to provide for the secure attachment of the film or covering layer to the article, but the cement is not essential to the presence of the invention and the layer may or may not be attached by such means.

It is to be understood that this same method and process may be employed in the production of a wide range of articles and is not limited to use in connection with a vehicle-frame or parts thereof—as handle-bars, pedals, rims, guards, and the like—but may be used with equal success in covering articles of many different substances.

The manner of covering the toe-piece d is similar to that already described and may well illustrate the manner of applying this invention to any article of irregular shape. A die l of proper outline is used to produce the cover l', which has the general outline of the surface in toe-piece, but is sufficiently larger to provide for the bending of the cover about the edges and partly onto the opposite surfaces. A similar piece closely conforming to the shape and outline of the opposite side is cut from a sheet of the film and the edges of the other piece bent about it form the seams l^2.

I claim as my invention—

The within-described process of providing a vehicle-frame or other article with a protective layer of celluloid or like material, which consists in applying a thin strip of the material under tension to the article; subjecting the parts to hot water and pressure; releasing the tension and adjusting a flexible and elastic but substantial shield upon the blank and article; inclosing these parts in a bag and exhausting the air therefrom; subjecting said bag and contents to heat and pressure, and lastly cooling and separating the separable parts, substantially as specified.

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Witnesses:
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