F. H. LUENSE.

PROPELLER.

APPLICATION FILED NOV. 10, 1916.

1,261,141. Patented Apr. 2, 1918.

Fig. 1.

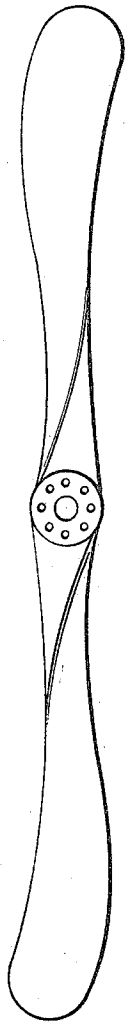


Fig. 3.

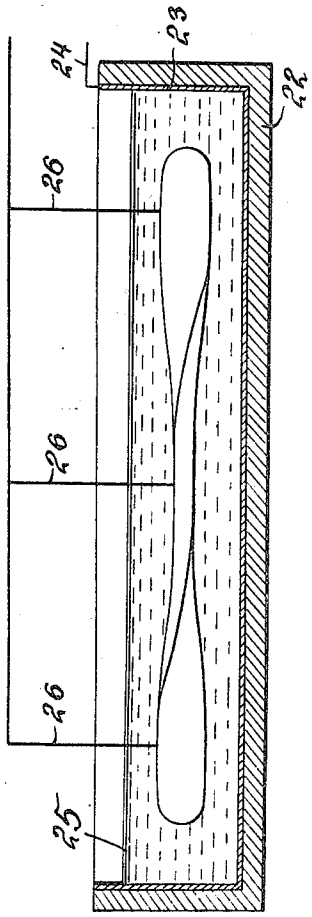


Fig. 5.

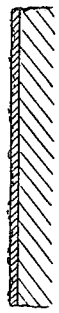


Fig. 4.

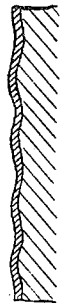
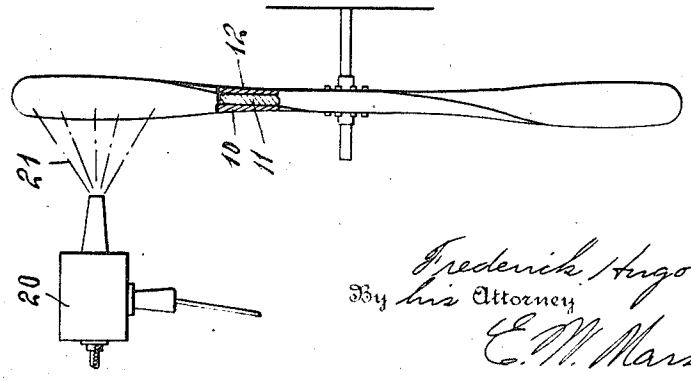


Fig. 2.



Inventor

Frederick Hugo Luense

By his Attorney

E. W. Marshall

UNITED STATES PATENT OFFICE.

FREDERICK HUGO LUENSE, OF STAPLETON, NEW YORK.

PROPELLER.

1,261,141. Specification of Letters Patent. Patented Apr. 2, 1918.

Application filed November 10, 1916. Serial No. 130,505.

To all whom it may concern:

Be it known that I, FREDERICK H. LUENSE, a subject of the Emperor of Germany, having announced my intention of becoming a citizen of the United States of America, and a resident of Stapleton, Staten Island, Richmond county, and State of New York, have invented certain new and useful Improvements in Propellers, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to methods or processes of coating or finishing articles and has special reference to such as are applicable to aerial propellers and other devices made of wood.

One object of my invention is to provide a simple and effective process of coating or finishing non-metallic articles, whereby a metallic coating is produced which is very intimately united with the article itself.

Another object is to provide a process of coating which shall comprise a combination of definite steps which are particularly adapted to coöperate in the production of a single metallic coating possessing many advantages over coatings produced by either of the steps taken alone.

Propellers for aerial navigation are relatively large and operate at high speeds and they are of course necessarily light and strong. In order to fulfil these conditions, they are usually made of wood and are built up in sections which are very carefully united. Furthermore, the wood is very carefully dried to avoid warping and twisting, but when propellers of this nature are subjected to adverse atmospheric conditions such as are encountered, for example, in tropical countries, they rapidly deteriorate and in many instances have been known to go to pieces.

The process of my invention is particularly adapted for the purpose of providing a coating which shall hermetically seal the propeller and overcome the above-named difficulties.

In order that my invention may be thoroughly understood I will now proceed to describe the same in the following specification, and then point out the novel features thereof in appended claims.

Referring to the drawings:

Figure 1 is an end elevation of a propeller which may be provided with a coating applied in accordance with the process of my invention.

Fig. 2 is a side elevation partly in section of a propeller and other devices and illustrates one of the steps of the coating process in which the propeller is sprayed with molten metal in a finely divided form.

The next step of the process is illustrated in Fig. 3 which shows the propeller in an electrolytic bath.

Fig. 4 illustrates on a very large scale, the form of the surface as first produced by the process steps of Figs. 2 and 3, and

Fig. 5 illustrates the result of the next step of the process, viz., that of burnishing the surface.

It will of course be understood that my process is by no means limited to wooden propellers or any particular class of articles.

The propeller illustrated is formed of laminations 10, 11 and 12 of wood, which are securely glued together to make a single piece and are then shaped to the desired propeller form. The wood is finished smooth to the desired shape but no filler or finish is applied before it is subjected to the first step of the coating process.

This process with which my present invention is particularly concerned, consists of first spraying the propeller with molten metal in a finely divided form.

This may be accomplished by the use of any well known apparatus such as that designated 20 in Fig. 2. In this arrangement compressed air or other suitable gas is utilized for atomizing molten metal and spraying it, as shown at 21 upon the surface of the propeller.

The metal utilized may be zinc, bronze, copper or aluminum, or some other suitable material. As the fine particles of metal strike the surface of the wood with high velocity, they sink into the pores of the wood and adhere very tenaciously thereto. By this reason a metallic coating is formed in particularly intimate connection with the surface of the propeller. This coating forms an excellent foundation for the next step of the process which consists in subjecting the very thinly coated propeller to the action of an electrolytic bath as shown in Fig. 3, to electrolytically deposit; or, in other words, to electroplate the metallic coating already applied by the step illustrated in Fig. 2.

As shown in Fig. 3, 22 designates a container, having a metallic lining 23 which is connected by a conductor 24 to the positive side of a supply circuit. The propeller is immersed in the liquid bath 25 within the container and is connected by conductors 26 to the negative line terminal. The bath will of course depend upon the coating desired and may, for example, be a solution of copper sulfate. The electrolytic action is continued until the coating has the desired thickness after which the surface is preferably burnished.

The burnishing of the surface is for the purpose of causing the metal to flow and produce a substantially uniform coating with a smooth outer surface which has a very low air resistance.

Wooden articles or articles of other materials may be treated in the manner above described within the spirit and scope of my invention.

What I claim is:

1. The process of coating wood that consists in forcibly spraying the wood with molten metal in a finely divided form to inject the metal into the surface of the wood and to seal the wood against moisture, and then immersing the coated wood in an electrolytic bath and electrolytically depositing additional metal on the coated wood.

2. The process of coating wood that consists in forcibly spraying the wood with molten metal in a finely divided form to inject the metal into the surface of the wood and to seal the wood against moisture, then immersing the coated wood in an electrolytic bath and electrolytically depositing additional metal on the coated wood, and burnishing or polishing the surface to uniformly distribute the metal in the coating.

In witness whereof, I have hereunto set my hand this 2 day of November, 1916.

FREDERICK HUGO LUENSE.