June 7, 1932. A. CHRISTOPH 1,861,593

SHUTTLE

Filed April 7, 1930

Fig. 1

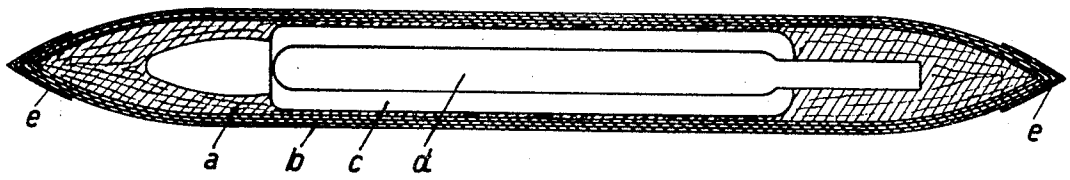
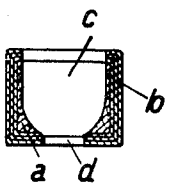


Fig. 2



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UNITED STATES PATENT OFFICE

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SHUTTLE

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My invention relates to shuttles and one of its objects is to provide a shuttle of high mechanical strength and resistivity capable of withstanding the stresses, to which a shuttle is subjected during the weaving process, in a better way than shuttles hitherto produced.

The wooden shuttles nowadays in use are soon worn down, being exposed, in view of the high wear and rough handling, to tearing and splintering of the wood apart from the disadvantages involved in the swelling, shrinking and warping of the wood. They become unfit for use as soon as the wood splinters or becomes roughened at the edges of the cavity receiving the bobbin, because in such case the weft thread is liable to jam or to be braked in its course.

It has therefore been suggested to coat the wooden shuttle with a protective skin, for instance with a leather skin. It has however been found that a leather skin is unduly dependent from the influences of moisture and by swelling in moist air enlarges the cross section of the shuttle to the extent that it is liable to jam in the shuttle box. Leather further has a tendency to scale off and for this and the other reasons mentioned above wooden shuttles coated with a leather skin have come out of use altogether.

Vulcan fibre has further been suggested as a covering for the wooden shuttle, however this material lacks sufficient mechanical strength and cannot be united with the shuttle body in a sufficiently intimate manner. A fibre skin will become rough at all places exposed to friction and will therefore exert a braking effect on the shuttle. Celluloid skins have proved altogether unsuitable in view of the high mechanical stress placed thereon and further in view of the ready inflammability of the material.

It has further been suggested to solve this problem by impregnating the wooden shuttle body with an artificial resin. It has however been found that the splintering of the wood cannot be avoided by such impregnation. Therefore shuttles have been recommended consisting of a number of superposed and firmly united layers of a fabric impregnated with artificial resins. It has however been found that the weight of such shuttles is prohibitive, the mass inertia of such a shuttle being too high.

According to the present invention now a wooden shuttle body is formed with a coating or skin consisting of a fabric impregnated with artificial resin. A shuttle according to this invention fully corresponds to all requirements of the modern art of weaving not only as regards comparatively low weight and mechanical strength, but also resistivity against all variations of shape and cross section and against the action of moisture and heat.

If a skin of fabric impregnated with artificial resin is mounted under high pressure on the wooden shuttle body it will be firmly united therewith and in practical use the surface of the skin will gradually become smoother.

In view of the high mechanical resistivity of this skin the shuttle body may be made of wood having a particularly low specific weight.

Obviously instead of an impregnated fabric also layers of textile fibres, similarly impregnated with artificial resin, may be used.

Obviously the impregnated skin after having been mounted in place on the wooden shuttle body must be subjected to the combined action of heat and pressure in order to convert the soluble resin into a hard and insoluble final product, in a manner well known to those skilled in the art

In the drawing affixed to the specification and forming part thereof, a shuttle embodying this invention is illustrated diagrammatically by way of example.

In the drawing

Fig. 1 is a longitudinal section, while

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

Referring to the drawing, *a* is the wooden shuttle body and *b* is a strip of fabric impregnated with an artificial resin, this strip being tightly wound around the shuttle body and being then exposed to the combined action of heat and pressure in the usual manner. If desired, the outer configuration of

this compound shuttle body can be modified subsequently by mechanical means, for instance by milling, grinding and the like, by turning the ends of the body etc. In this body, which is solid at first, the cavity *c* and the bottom slot *d* are now formed by milling. As shown in Fig. 2, the wood *a* is removed almost totally in the middle part of the shuttle and, if desired, the wood may even be removed here altogether.

The ends of the shuttle may be reinforced by steel caps *e* as usual, or the tips of the shuttle body may be cut off and solid conical steel points may be mounted thereon in a well known manner.

Of course, if desired, the wooden core of the shuttle body may also be excavated by milling before the skin is mounted thereon.

While in the modification shown in the drawing the skin *b* is supposed to consist of a strip of impregnated fabric wound around the wooden core, such a skin may equally well be formed of a felt-like mass of fibres similarly impregnated with a soluble artificial resin, such layer being thereafter subjected to the combined action of heat and high pressure, to compress and smooth it and to simultaneously convert the soluble resin into the hard insoluble final product.

Instead of a fabric or a felt-like web of fibres paper impregnated with an artificial resin may be used to protect the wooden body.

The term "artificial resins" include all products known in the trade as being formed under the combined action of heat and pressure from plastic and partly also soluble intermediate products, such as for instance the products of condensation of a phenol with an aldehyde.

I wish it to be understood that I do not desire to be limited to the exact details of construction shown and described for obvious modifications will occur to a person skilled in the art.

In the claims affixed to this specification no selection of any particular modification of the invention is intended to the exclusion of other modifications thereof and the right to subsequently make claim to any modification not covered by these claims is expressly reserved.

I claim:—

The method of producing shuttles comprising securing on a solid wooden blank a skin consisting of fibrous material impregnated with a soluble artificial resin, subjecting the whole to the combined action of heat and pressure to render the resin insoluble and removing part of the wood by mechanical action.

In testimony whereof I affix my signature.

ALFRED CHRISTOPH.