Dec. 12, 1944. H. MENKING 2,364,740

SHUTTLE

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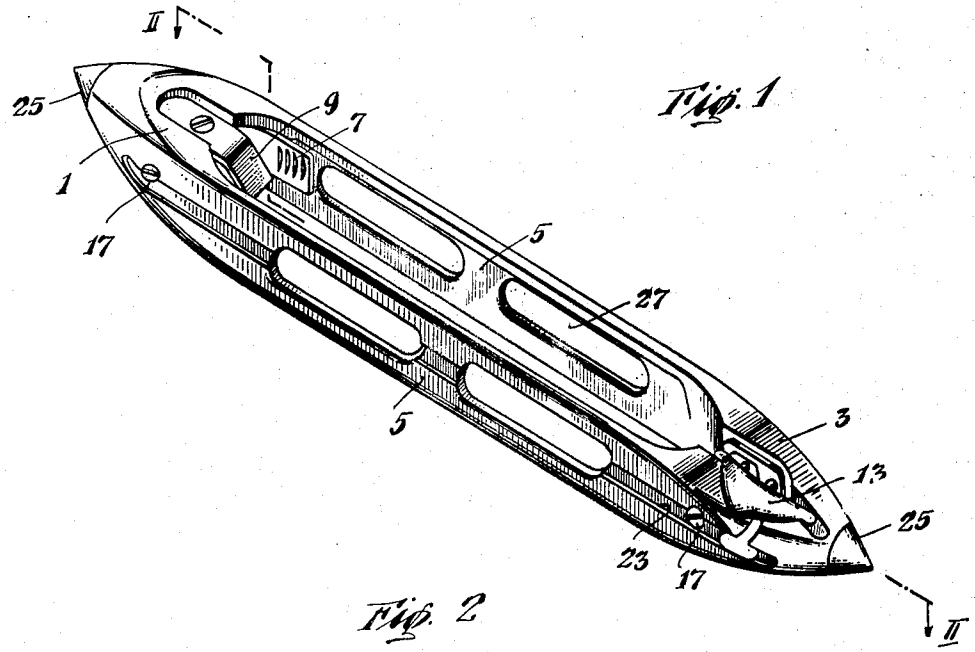


Fig. 1

Fig. 2

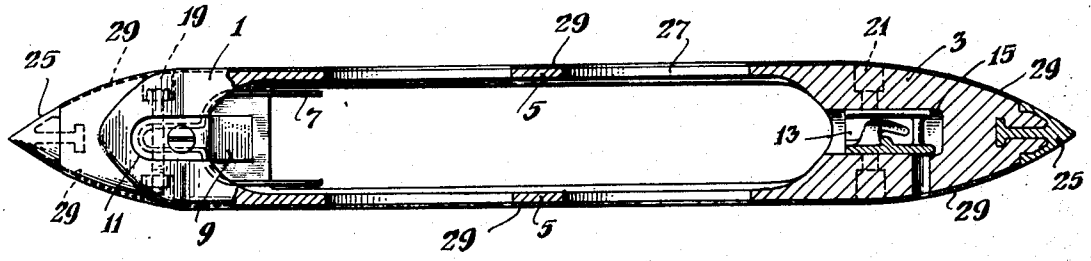


Fig. 3

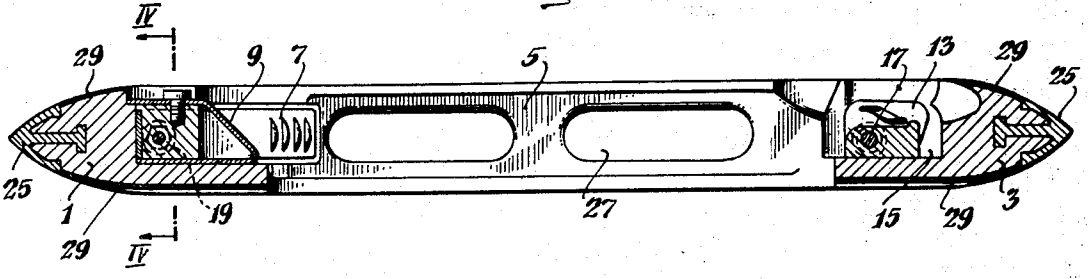
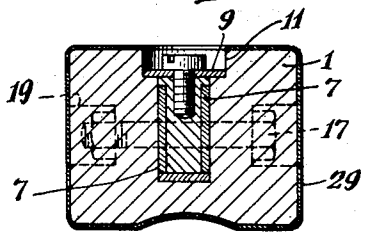


Fig. 4



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SHUTTLE

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5 Claims. (Cl. 139—196)

This invention relates to shuttles made of magnesium and the alloys in which it predominates, preferably the alloys containing 80 per cent magnesium by weight. The term magnesic metal, however, will be used hereinbelow to designate both commercially pure and the alloys in which it is the base metal.

Shuttles which have been employed in the textile industry have generally been made of wood with spurs, eyes, spring clamps, filling bobbin, and other parts pertaining to the holding and paying off of the yarn being attached to or inserted in the wooden frame. While wooden shuttles are light of weight, they are subject to splitting, particularly at the eye portion, splintering, roughening, and considerable wear, especially on the shoulders. Difficulty is also encountered from loosening of the spurs, eyes, and spring clamps. A split or splintered shuttle can cause damage to the loom, the warp, the cloth being woven, and to the loom operator. Because of these shortcomings of wooden shuttles, the period of their useful life is uncertain and limited.

To overcome the deficiencies of wooden shuttles a variety of metallic shuttles have been proposed. In substituting metal for wood it has been difficult to obtain an article which is as light as the wooden shuttle and yet is strong and resilient enough to withstand the blows given by the picker stick. Still another difficulty which has often been encountered, particularly where light metal shuttles have been tried, is the tendency of the metal to soil the yarn with which it comes in contact. The action of such metals on the yarn is known in the art as "crocking."

Magnesic metal is particularly adapted for use in a shuttle because of its light weight combined with adequate strength and high resilience. The last named property is of special value in making the shuttle withstand the impacts incident to its operation. In spite of these advantages of magnesic metal, it has not been commercially employed for shuttle material because of its relatively low resistance to wear.

My invention is directed to overcoming the foregoing deficiencies of metallic shuttles, and to taking advantage of the beneficial properties of magnesic metal, the primary object being the provision of a durable, lightweight magnesic metal shuttle. One of the particular objects of my invention is to provide a magnesic metal shuttle which does not crock in service. Another particular object is to provide a magnesic metal shuttle which has a much higher resistance to wear than bare magnesic metal. These and other objects will be apparent from the following description and appended claims.

My invention consists in providing a metallic wear-resistant coating over at least the portion of the external surface of a magnesic metal shuttle which comes in contact with the yarn, the reed, and shuttle box. The metallic coating must resist wear, be capable of receiving and retaining a smooth finish, and be free from crocking. Furthermore, the coating must be firmly attached to the magnesic metal base and must be capable of undergoing the degree of bending incident to the operation of the shuttles, especially the deflection of the side walls which occurs under impact. I have found that such metallic coatings as a chrome, nickel, or brass plate or sprayed ferrous metals, especially stainless steel, make a very suitable covering for a magnesic metal shuttle. Under certain conditions coatings of such metals as copper and cadmium may also be satisfactory. These coatings, when properly applied, are very adherent to the base metal and provide a very smooth wear-resistant surface free from crocking.

Although in the preferred form of my invention the entire external surface of the shuttle is to be plated or coated with a metal, it is also possible to plate only certain portions thereof by applying suitable block-off materials on the shuttle body. In any event, it is necessary to provide a metallic coating on the portions of the shuttle which come in contact with the yarn, the reed, and the shuttle box, namely, the two edges contacting the warp, the side facing the reed, and the shoulders, respectively.

In selecting a metallic coating, it is necessary to use one which is more resistant to wear than magnesic metal and which forms a dense, smooth coating free from crocking. There are a variety of metals which are available for coating. However, a chromium coating is the best because of its relatively low cost and because of the smooth wear-resistant surface.

The method of applying metal coatings forms no part of this invention, suitable methods being known to those skilled in the art.

The construction of a magnesic metal shuttle made in accordance with my invention may be understood by referring to the accompanying figures where

Fig. 1 is a perspective view of the shuttle;

Fig. 2 is a broken plan view taken on line II—II of Fig. 1;

Fig. 3 is a longitudinal cross section in a verti-

cal plane, at a right angle to the section shown in Fig. 2; and

Fig. 4 is a transverse cross section, taken on line IV—IV of Fig. 2.

The shuttle body, which is made of magnesic metal, consists of end portions 1 and 3 connected by side wall members 5. The filling bobbin, which is not shown, is accommodated in the space between the end portions and side walls of the shuttle. Bobbin holding means 7 and bobbin guide 9 in recess 11 are located in end portion 1, while a conventional shuttle eye 13 is located in recess 15 in end portion 3, the recesses being shown most clearly in Fig. 2. A recess is provided in end portion 1 and the adjoining shuttle wall 5, on either side of bobbin guide 9, to accommodate the bobbin holding means 7. These fittings are secured in position by screws or bolts 17 in openings 19 and 21 in end portions 1 and 3, respectively, as illustrated in Figs. 2 and 3. Along the side wall where the yarn travels from the shuttle eye 13 is a groove 23 to accommodate the yarn. Steel spurs 25 are located at both ends of the shuttle. Openings 27 are provided in side walls 5 to effect a reduction in the weight of the shuttle body. The entire external surface of the shuttle, with the exception of the spurs, is covered with a metallic coating 29, as shown clearly in Figs. 2, 3, and 4. The coating, as illustrated, is of exaggerated thickness in order to show it plainly since the actual coating may be but a few thousandths of an inch, or often less than that, in thickness.

The provision of a metallic coating on the shuttle possesses the advantage, in addition to preventing crocking, of being readily replaced if necessary. The old coating may be stripped off and another one put in its place, or in some instances it may be possible to apply a new coating over the old one. In this manner a magnesic metal shuttle may be used for a long period of time, much longer in fact than any of the wooden or metallic shuttles heretofore employed.

Having described my invention and an embodiment thereof, I claim:

1. A shuttle comprising a body of magnesic metal and a smooth wear-resistant metallic coating free from crocking thereon, said coating covering at least a portion of the external surface of said body.

2. A shuttle comprising a body of magnesic metal and a smooth wear-resistant metallic coating free from crocking thereon, said coating covering substantially the entire external surface of said body.

3. A shuttle comprising a body of magnesic metal and a chromium coating thereon covering at least a portion of the external surface of said body.

4. A shuttle comprising a body of magnesic metal and a brass coating thereon covering at least a portion of the external surface of said body.

5. A shuttle comprising a body of magnesic metal and a stainless steel coating sprayed thereon covering at least a portion of the external surface of said body.

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