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GUIDE PLATE FOR THE BOBBINS OF BRAIDING MACHINES.

APPLICATION FILED DEC. 31, 1918.

1,315,265. Patented Sept. 9, 1919.

Fig. 1

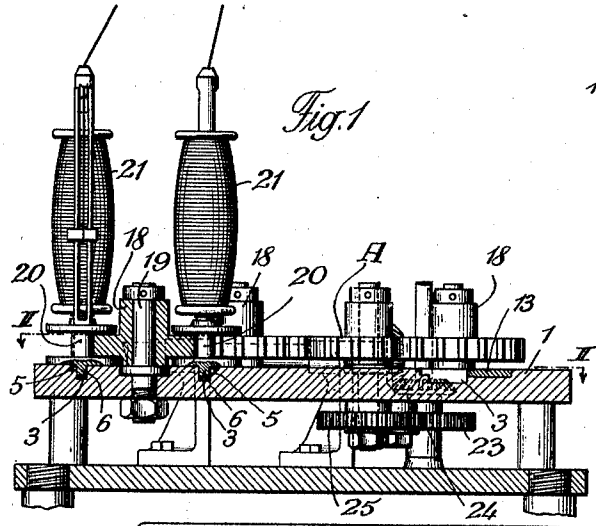


Fig. 3

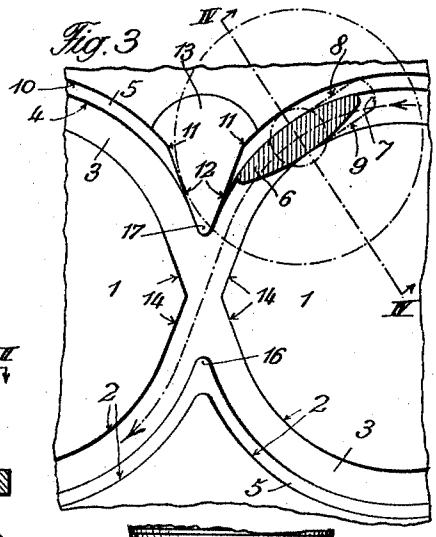


Fig. 2

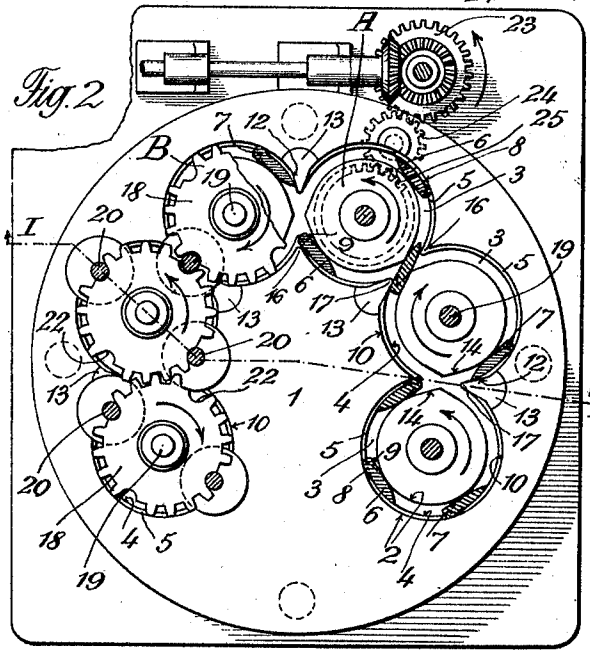


Fig. 4

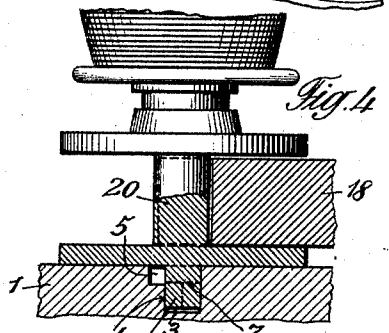


Fig. 7

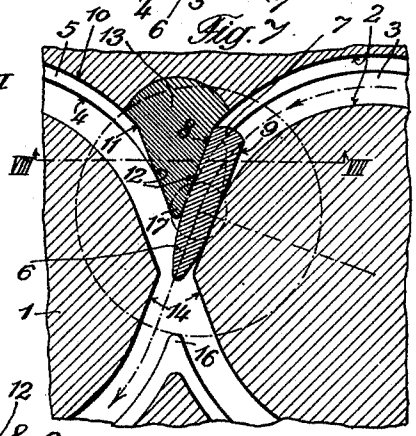


Fig. 5

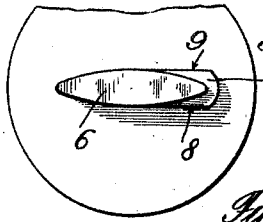
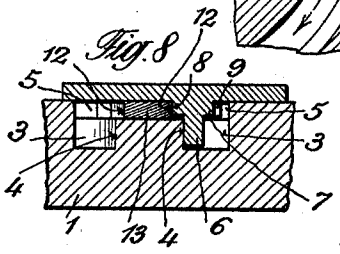


Fig. 6



Fig. 8



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GUIDE-PLATE FOR THE BOBBINS OF BRAIDING-MACHINES.

1,315,265. Specification of Letters Patent. Patented Sept. 9, 1919.

Application filed December 31, 1918. Serial No. 269,042.

To all whom it may concern:

Be it known that I, ERWIN WALTER, a citizen of the Republic of Switzerland, residing at Mellingen, Aargau, Switzerland, have invented certain new and useful Improvements in Guide-Plates for the Bobbins of Braiding-Machines; and I do hereby declare the following to be a clear, full, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, and to letters or figures of reference marked thereon, which form a part of this specification.

The present invention relates to improvements in guide plates for the bobbins of braiding machines provided with shuttles traveling in grooves of the guide plate. According to the present invention the grooves of the guide plate comprise two stages, the one of which is designed in the conventional manner and forming a groove provided with an outer wall having the shape of an arc of a circle serves for receiving a shuttle having also arc-shaped walls, while the other stage serves for receiving a projection of the shuttle. This projection acts as a support for the shuttle when the bobbin passes from a groove into the succeeding one and prevents thereby any disturbing rotation of the shuttle, and consequently of the bobbin, about the vertical axis passing through the center of gravity of the bobbin.

The invention will now be more particularly described with reference to the accompanying drawing illustrating by way of example a construction according to the invention. In this drawing:

Figure 1 is a vertical cross-section through a guide plate on the line I—I of Fig. 2, illustrating adjacent parts of the braiding machine in elevation.

Fig. 2 is a horizontal section on the line II—II of Fig. 1 looking downward in the direction of the arrows;

Fig. 3 illustrates a top view of a portion of the guide plate having grooves comprising two stages and a section through a shuttle;

Fig. 4 shows partly a front view and partly a section on the line IV—IV of Fig. 3 of a bobbin and its shuttle and of the adjacent parts of the braiding machine;

Fig. 5 is a bottom view and

Fig. 6 is a side view of the shuttle;

Fig. 7 is a view corresponding substantially to Fig. 3, but illustrating the bobbin in another position, and

Fig. 8 is a section on the line VIII—VIII of Fig. 7.

Referring to the drawings, 1 denotes the guide plate of the braiding machine having two circular grooves 2, 2. Each of the grooves 2, 2 comprises two stages. The lower stage 3 of these grooves is of conventional design and has an outer wall 4 having the shape of an arc of a circle, while the upper stage 5 serves for receiving the rectangular projection 7 (Figs. 4, 5, 6, 8) provided on the shuttle 6 and having rectilinear or straight lateral walls 8 and 9. The height of the upper stage 5 of the groove is at least approximately equal to the height of the projection 7, while the total height of the two stages 3 and 5 is at least approximately equal to the height of the shuttle 6.

The outer wall 10 of the upper stage 5 has also the shape of an arc of a circle up to a point 11 where it passes into a straight wall portion 12, while the outer wall 4 of the lower stage 3 is of circular shape up to the point 17, where the groove ceases. The line of the wall portion 12 forms at the point 17 a tangent touching the arc of a circle of the wall 4, and the point 11 is the point of intersection of this tangent with the line of the outer wall 10.

The wall 12 constitutes the side face of a guide member 13 of angular shape. The arrangement is such that each of the two adjacent grooves 2, 2 is provided at its end with such a straight wall 12. The guide member 13 is preferably stamped out of a metallic plate, and it is inserted into a corresponding milled notch provided in the guide plate 1. The thickness of the metallic plate corresponds at least approximately to the height of the projection 7.

The inner walls of the grooves 2, 2 pass at the points of transition of a groove into the next one over into straight walls 14.

18 (Figs. 1, 2) designates drivers free to rotate on a stud or bolt 19 rigidly secured in the guide plate 1. The greater portion of the periphery of each driver 18 has teeth and all the drivers are in mutual engage-

ment. The remaining portion of each driver 18 has notches 22 which serve to receive and advance the spindles 20 for the bobbins 21. One of the drivers, for instance A in Fig. 2, is positively driven from the spur wheel 23 of the main machine drive by means of the intermediate gears 24 and 25, the latter being fast on the shaft of the wheel A, and drives the two adjacent meshing drivers 18, which actuate in turn the drivers 18 meshing therewith, and so on.

The described construction works as follows:

When a spindle 20 passes with its bobbin 21 from one driver 18 into the next one, *i. e.*, at the point where the groove ceases and the shuttle is no longer supported by walls (chiefly the outer walls) of the groove, the bobbin is subjected to a kinetic energy due to a rotation about the center of the driver or groove respectively. Owing to this kinetic energy to which the bobbin is subjected, the latter, and therefore also the shuttle, has the tendency—in consequence of its inertia tending to keep up said rotary movement—to rotate further about its vertical axis passing through the center of gravity of said bobbin in the direction in which it would be caused to rotate by the wall of the circular groove when such a groove would be present. At the same time, the bobbin has at the point where the groove ceases the tendency to wander farther in the direction of the tangent touching the circle described by the vertical axis passing through the center of gravity of the bobbin. When the guide plate admits a rotation of the bobbin about the vertical axis passing through its center of gravity, such a rotation prevents the longitudinal axis of the shuttle from coinciding with the longitudinal axis of the continuation of the grooves and causes on the contrary the front pointed end of the shuttle to strike violently against the outer wall of the next groove. As a rule, the shuttle rebounds from said wall and strikes against the inner wall of the groove. Owing to this continued bounding causing a violent throwing about of the shuttle, the walls of the groove are not only damaged, but the bobbins become useless very soon as the point of the shuttle wears out in a short span of time.

In order to remedy this drawback, the shuttle is guided in the described construction in a secure and proper manner at the point of transition from one groove into the next one owing to the hereinbefore described shape of the grooves and by means of the projection provided on the shuttle. When the bobbin, and consequently the shuttle, has been moved from the position illustrated in Fig. 3, in which the shuttle wanders in the lower stage 3 of the groove, while the projection 7 slides with small friction along the outer wall of the upper stage 5 of the groove, into the position shown in Fig. 7, the bobbin starts to travel into the succeeding groove. The straight wall 8 of the projection 7 comes at this moment in contact with the straight wall 12 of the guide member 13 of angular shape. The shuttle guided at this moment also by the straight walls 14 is then supported on both sides, so that it is prevented from rotating in the sense above mentioned, as the kinetic energy having the tendency to bring about a rotary movement is taken up by the straight wall 12 of the guide member 13 and destroyed, so that the bobbin travels over a longer distance in a straight direction in the direction of the tangent touching the outer wall 4 at the point 17, the projection of its shuttle being guided by the wall 12 coinciding with said tangent. When the bobbin has been moved past the point 17, where the wall 12 ceases, the shuttle is guided by the wall 9 of the projection 7 along the straight wall 14; the front pointed end of the shuttle has then been moved past point 16 of the next groove and the shuttle is guided into the next groove without its pointed front end striking against the wall of the last mentioned groove.

Owing to the insertion of the guide member 13 into the guide plate, the shape of an arc of a circle may be given to the outer walls of the two stages of the grooves resulting in a considerable advantage, as such a groove can be easily milled, which is not the case with regard to the groove of conventional shape having a straight portion of the point where the bobbin wanders from one driver to the next one.

What I claim now as my invention is:

1. In a braiding machine, in combination with a guide plate provided with grooves, of bobbin spindles, shuttles connected to said spindles and each provided with a projection, and means causing said bobbin spindles to travel in the grooves of the guide plate, the grooves of said guide plate comprising two stages, the one of which having arc shaped lateral walls serves for receiving the shuttles having also arc shaped walls, while the other stage serves for receiving the projection provided on the shuttle and acting as a support for the latter when the bobbin spindle passes from one groove into the succeeding one, said projection preventing thereby any disturbing rotation of the shuttle and the bobbin about the vertical axis passing through the center of gravity of the bobbin.

2. In a braiding machine, in combination with a guide plate provided with grooves, of bobbin spindles, shuttles connected to said spindles and provided near their upper portion with a projection, and means for caus-

ing said bobbin spindles to travel in the grooves of the guide plate, the grooves of said guide plate comprising two stages, the lower one of which having arc shaped lateral walls serves for receiving the shuttles having also arc shaped walls, while the upper stage serves for receiving the projection provided on the shuttle acting as a support for the latter when the bobbin spindle passes from one groove into the succeeding one and preventing thereby a disturbing rotation of the shuttle and the bobbin about the vertical axis passing through the center of gravity of the bobbin.

3. In a braiding machine, in combination with a guide plate provided with grooves, of bobbin spindles, shuttles connected to said spindles and provided near their upper portion with a projection, and means for causing said bobbin spindles to travel in the grooves of the guide plate, the grooves of said guide plate comprising two stages, the lower one of which having arc shaped lateral walls serves for receiving the shuttles having also arc shaped walls, while the upper stage serves for receiving the projection provided on the shuttle acting as a support for the latter when the bobbin spindle passes from one groove into the succeeding one, the height of the upper stage of the grooves corresponding to the height of the projection and the total height of both stages corresponding approximately to the height of the shuttle.

4. In a braiding machine, in combination with a guide plate provided with grooves, of bobbin spindles, shuttles connected to said spindles and provided near their upper portion with a projection, and means for causing said bobbin spindles to travel in the grooves of the guide plate, the grooves of said guide plate comprising two stages, the lower one of which having arc shaped lateral walls serves for receiving the shuttles having also arc shaped walls, while the upper stage having at the end of the grooves a straight portion serves for receiving the projection provided on the shuttle acting as a support for the latter when the bobbin spindle passes from one groove into the succeeding one, said projection having straight lateral walls being guided by said straight wall portion at the end of the stages so as to direct the shuttle passing out of a groove into the next one.

5. In a braiding machine, in combination with a guide plate provided with grooves, of an angular guide member inserted into the guide plate at the end of two adjacent grooves of said plate and having two straight lateral walls, bobbin spindles, shuttles connected to said spindles and provided near their upper portion with a projection having straight lateral walls, and means for causing said bobbin spindles to travel in the grooves of the guide plate, the grooves of said guide plate comprising two stages, the lower one of which having arc shaped lateral walls serves for receiving the shuttles having also arc shaped walls, while the upper stage having at the end of the grooves a straight portion serves for receiving the projection provided on the shuttle acting as a support for the latter when the bobbin spindle passes from one groove into the succeeding one, said projection being guided when passing with its straight lateral walls past said straight wall portion at the end of the stages so as to direct the shuttle passing out of a groove into the next one, and the height of said angular guide member being at least equal to the height of the projection and said straight lateral walls of the guide member constituting the rectilinear ends of the outer wall of the upper stage of the grooves.

6. In a braiding machine, in combination with a guide plate provided with grooves, of an angular guide member inserted into the guide plate at the end of two adjacent grooves of said plate and having two straight lateral walls, bobbin spindles, shuttles connected to said spindles and provided near their upper portion with a projection having straight lateral walls, and means for causing said bobbin spindles to travel in the grooves of the guide plate, the grooves of said guide plate comprising two stages, the lower one of which having arc shaped lateral walls serves for receiving the shuttles having also arc shaped walls, while the upper stage having at the end of the grooves a straight portion serves for receiving the projection provided on the shuttle acting as a support for the latter when the bobbin spindles pass from one groove into the following one, said projection being guided when passing with its straight lateral walls past said straight wall portion at the end of the stages so as to direct the shuttle passing out of a groove into the next one, said straight lateral walls of the guide member constituting the rectilinear ends of the outer walls of the upper stage of the grooves and having the same direction as the tangent touching the arc of a circle of the outer wall of the lower stage of the appertaining groove at the point where said groove ceases.

In testimony that I claim the foregoing as my invention, I have signed my name.

ERWIN WALTER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."