R. C. RAHM.

BRAIDING MACHINE.

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1,337,269.

Patented Apr. 20, 1920.

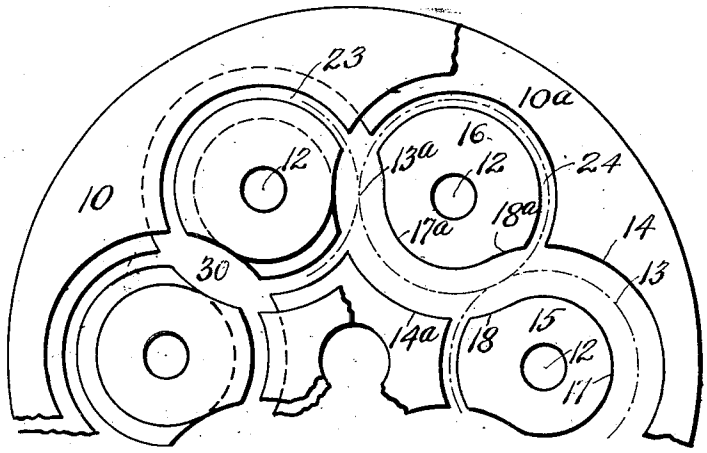


Fig. 1

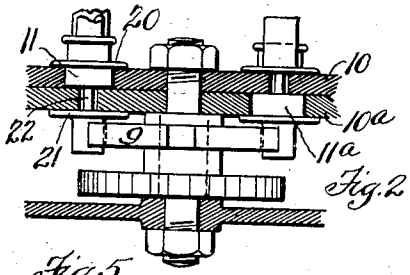


Fig. 2

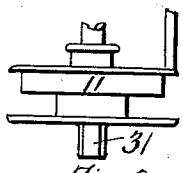


Fig. 3

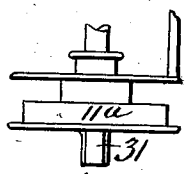


Fig. 4

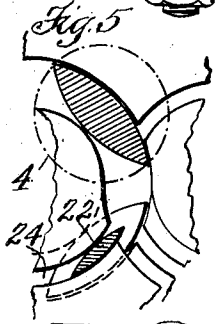


Fig. 5

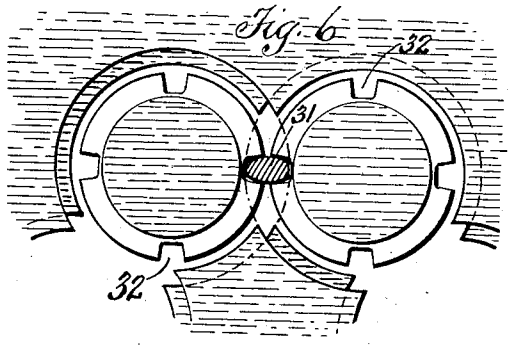


Fig. 6

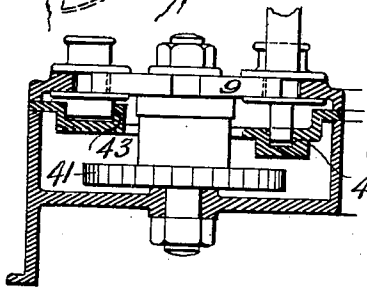


Fig. 7

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ROBERT CARL RAHM, OF WYOMISSING, PENNSYLVANIA.

BRAIDING-MACHINE.

1,337,269. Specification of Letters Patent. Patented Apr. 20, 1920.

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To all whom it may concern:

Be it known that I, ROBERT CARL RAHM, a citizen of the United States, residing at Wyomissing, near Reading, in the county of Berks and State of Pennsylvania, have invented certain new and useful Improvements in Braiding-Machines, of which the following is a specification.

My invention relates to braiding machines, and particularly to improvements in the construction of the carrier race-ways and of the carriers traversing the same, as fully described in connection with the accompanying drawing and the novel features of which are defined in the subjoined claims.

Figure 1 is a plan view of a portion of a braiding machine embodying my improved carrier race-way construction in preferred form; part of the upper top-plate section employed being broken away to more clearly show the lower section thereof and the relative arrangement of the ways formed in the respective sections.

Fig. 2 is a cross-sectional view of the two-section top plate of Fig. 1, shown in connection with the foot portions of oppositely running bobbin carriers engaged in the respective race-ways, and a drive gear therefor.

Figs. 3 and 4 are separate views of the two carriers indicated in Fig. 1 showing the relative location of the shuttle portions and connecting stems thereof.

Fig. 5 is a diagrammatic plan view of a section of my improved race-way construction with cross-sectional views of the shuttle and connecting stem portions respectively of two engaged carriers.

Fig. 6 is a plan view indicating two adjacent carrier-drive gears and their improved operating engagement with a driven carrier; a race-way with an outer wall only being indicated.

Fig. 7 shows a modified construction.

The primary object of my invention is to provide for improving the running of the reversely traveling bobbin carriers so as to reduce to a minimum the incidental friction, noise, and power expenditure, and at the same time increase the operating capacity.

At the crossing points of fixed carrier race-ways ordinarily employed in braiding machines, as indicated in Fig. 6, straight line portions 2, 2 of the ways are provided to insure proper transfer of the carriers from one race-circle to another, and the wound bobbin portions of the carriers require to be kept within an objectionably small size to insure passage of oppositely moving carriers without conflict.

The essential feature of my invention consists in providing fixed courses for the oppositely moving carriers made up of semi-circular portions as indicated in Fig. 5, so as to wholly or approximately eliminate straight-line tangential portions and enable the employment of bobbins of large capacity, as indicated by the dotted circle 4 of Fig. 5; which permits a large saving to be made in required renewals; while the speeding-up of the carrier movements which my invention makes practicable effects a material increase in production.

The drawing indicates a small tubular braider embodying my invention in which separate series of bobbin carriers are reversely driven around each of the usual series of carrier-drive gears 9. As shown these reversely driven carriers follow race-ways arranged in different parallel planes and formed respectively in an upper section 10 and a lower section 10^a which jointly form the top plate of the machine, while the carriers of the two series have single shuttle portions, 11 or 11^a, arranged respectively to travel in these different planes.

Each race-way as shown is made up of directly tangential arcs having their centers at the successive carrier drive gear axes 12, 12, 12; the dotted circles 13, 13^a Fig. 1 indicating the pitch lines of these drive gears and the lines of travel of the carrier axes, and the arcs 14, 14^a forming outer wall portions of the ways: the inner walls for the latter which are provided for as shown in Figs. 1 and 2, being formed on "quoit" plates 15, 16 which are mounted above the gears upon the gear studs as usual, by arcs 17, 17^a directly tangential with outer-wall arcs 18, 18^a.

The single shuttle portion 11 or 11^a of each carrier is located between the plate-bearing collars 20, 21 upon the carrier stem 22, a connecting portion of which latter extends through the plane of the disengaged race-way below or above as the case may be; so that a clearance way for said connect-

ing stem portion is provided in each top plate section as indicated at 23 in the upper section and at 24 in the lower section. This connecting stem 22 is indicated in cross-section in Fig. 5, which also shows a cross-section of a shuttle portion engaged in the upper race-way.

This shuttle cross-section is roughly elliptical in form, the sides being conformed to the radius of the outer race-way wall and the cross section corresponding approximately with the race-way space indicated at 30 in Fig. 1 so that the shuttle will be positively held to its serpentine course.

As indicated in Fig. 6, I preferably provide the driven carriers with a drive gear engaging portion 31 having a cross-section combining the outer portions of properly shaped gear teeth extending oppositely and adapted to engage correspondingly shaped recesses 32 in the drive gears so as to secure a rolling drive contact and to practically maintain the carriers in their determined race-ways irrespective of any inner walls to the latter as provided for in the construction specifically set forth. Instead of the shaped quoits 15 and 16 circular disks may be substituted, the shuttle portions 11 of the carriers holding them to the prescribed race-way at the tangential connections of its semicircular curves, and the described tooth-shaped engagement of the drive gears with the carriers assisting their smooth movement.

In Fig. 7 I have indicated as an embodiment of the main features of my invention a modified construction which includes special features; the main modification indicated being the formation of cast race-ways for the two series of carriers, located between the toothed portion 41 of the drive wheel and its carrier engaging portion 9, with the race-ways in different planes 43 and 44 respectively.

What I claim is:

1. A braiding machine having two carrier race-ways arranged in different planes, and carriers in said ways each of which is provided with a single race-way-engaging shuttle; said carriers forming two series the single shuttles of which are arranged wholly in different planes.

2. A braiding machine having two carrier race-ways arranged in different planes, and two series of carriers in said ways; each of the carriers being provided with a single race-way-engaging shuttle of oblong cross-section and having oppositely bulging contour lines each conformed to the outer race-way walls, and the shuttles of each series being arranged in a different plane from those of the other series.

3. A braiding machine having two separate carrier race-ways arranged in different planes, each race-way having outer and inner walls in its own plane; and two series of carriers in said ways, each of the carriers being provided with a single race-way engaging shuttle.

4. A braiding machine having two carrier race-ways arranged in different planes, and two series of carriers in said ways; each of the carriers being provided with a single shuttle arranged in the plane of one of the race-ways and with a connecting stem in the plane of the other race-way.

5. A braiding machine having two top-plate sections arranged in different planes, said sections being formed with oppositely arranged serpentine carrier race-ways.

6. A braiding machine having two top-plate sections arranged in different planes, said sections being formed with oppositely arranged serpentine carrier race-ways and with a separate carrier-clearance way.

In testimony whereof I affix my signature.

ROBERT CARL RAHM.