

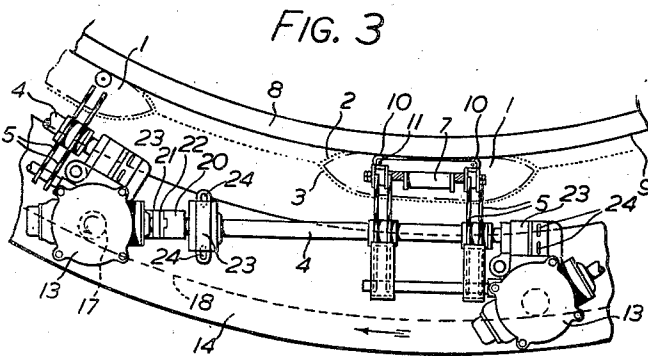
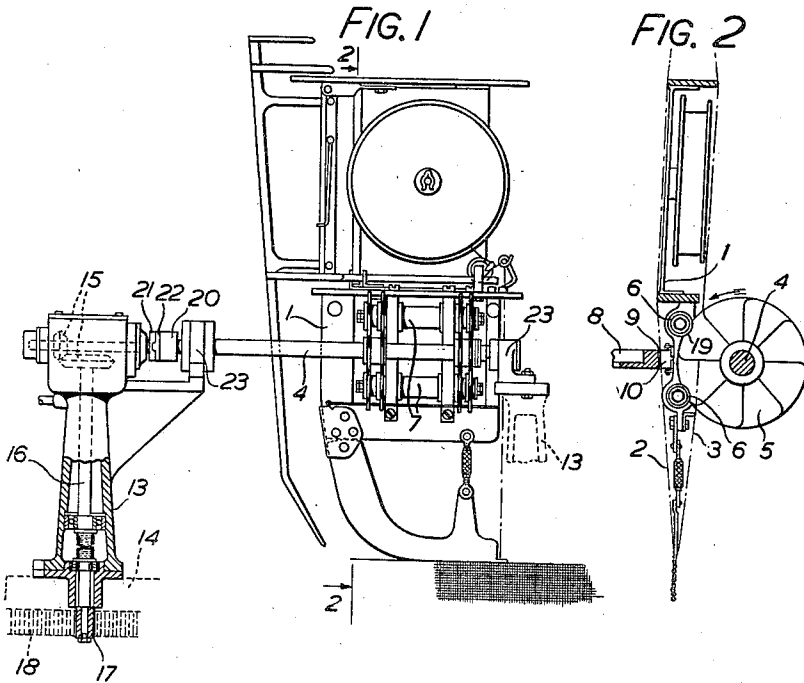
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CIRCULAR LOOM

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## UNITED STATES PATENT OFFICE

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## CIRCULAR LOOM

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This invention relates to circular looms, and has particular reference to looms in which the shuttles are positioned by means of vane wheels mounted on a rotatable shaft disposed to one side of the shuttle so that the vane wheels penetrating the sheet of warps at that side of the shuttle hold the shuttle in position while allowing the warps of that sheet to pass through the slots between the vanes.

One method of driving a shaft of this type provides for the extension of the shaft substantially tangentially away from the shuttle circle to gearing connecting the shaft with an annular gear concentric with the loom axis, the relative rotation between the shuttles and the warps providing that the annular gear drives the vane wheel shaft at a high speed.

The present invention provides for the adjustment of the vane wheels with respect to the shuttle in driving means of the type just described.

According to the invention one end of the vane wheel shaft terminates in a universal coupling so as to provide for a movement of the length of shaft adjacent to the shuttle without interrupting the driving connection to the shaft. Preferably an Oldham coupling is employed so as to provide for a movement of the vane wheel shaft parallel to itself, thus ensuring correct meshing of all the vane wheels with the corresponding parts (usually rollers) in the shuttle body. Thus, wear or slight variations in the diameters of the vane wheels or of their engaging rollers in the shuttle may be readily compensated for or adjustments made in the clearance between the parts of the shuttle-holding mechanism with no interference to the vane-wheel-driving mechanism.

The invention will now be described in greater detail with respect to the accompanying drawing, in which:

Fig. 1 is a part elevation of a shuttle and its vane wheel mechanism;

Fig. 2 is a vertical section taken on the line 2—2 of Fig. 1; and

Fig. 3 is a plan view corresponding to Fig. 1.

The shuttles 1 are held within warp sheds comprising inner and outer warp sheets 2, 3 formed by any suitable shedding means (not shown). Outside the shuttle circle are shafts 4, lying at their right-hand ends opposite the shuttles 1 and extending to the left parallel to tangents of the shuttle circle. Each shaft 4 carries two pairs of vane wheels 5, which penetrate the outer warp sheet 3 so as to engage rollers 6 freely mounted on horizontal axes 7 in the shuttle body

at heights above and below the height of the shaft 4. Each shuttle is thus supported at four points on its outer side.

Inside the shuttle circle lies the circular race 8, having an inclined face with a rubber covering 9. Opposite each pair of vane wheels 5 a roller 10 is mounted in the shuttle body on a pivot 11 parallel to the face of the race 8.

The rollers 10 bear against the race 8, the inner warp sheet 2 passing between the rollers and the race. Each shuttle is thus supported on its inner side at two points at a height intermediate the heights of the rollers 6, the two points providing for two symmetrically applied thrusts to oppose the thrusts of the vane wheels 5.

Each shuttle is thus nipped at two positions in its length by a pair of vane wheels 5 and by the race 8 engaging the corresponding roller 10. The shuttle is thus held steadily and prevented from undue rocking movement about a vertical axis, which improves the weft-laying of the several shuttles, gives smoother rolling of the vane wheel peripheries on the rollers 6, and generally adds to the performance of the loom.

The shafts 4 are carried by columns 13 mounted on a ring 14 rotatable about the axis of the loom. Bevel gears 15 connect the shafts 4 with shafts 16 inside the columns 13, the shafts 16 terminating in pinions 17 that mesh with a stationary annular gear 18, so that as the ring 14 is rotated (by means not shown) the vane wheel shafts 4 are rotated.

As the vane wheels 5 are carried by the ring 14 round the axis of the loom, they press against flanges 19 of the rollers 6 in the shuttles 1 and cause the shuttles to be propelled round the loom at the same speed as the ring 14. The rollers 10 rotate freely over the warps 2 lying between them and the race 8.

The rotation of the vane wheels 5 presents the slots between the vanes to the threads of the outer warp sheet 3 and allows those threads to pass the vane wheels.

The bodies of the rollers 6 may be made of slightly resilient material, e. g., fabric impregnated with synthetic resin and blocked to form a material capable of being machined. The flanges 19 are preferably of metal, as are the vane wheels.

Each vane wheel shaft 4 terminates in a universal coupling of the Oldham type, consisting of one external member 20 connected to the shaft 4, a second external member 21 connected to the bevel gearing 15 in the column 13, and an intermediate member 22. The intermediate member makes feather-and-slot connections with the two

external members, the respective feathers and slots being at right angles to each other.

The shaft 4, moreover, is carried in bearings 23 bolted to the columns 13 through slots 24 that permit the shaft to be moved towards or away from the shuttle 1. The vane wheels can thus be brought into correct engagement with the shuttles, and, in particular, caused to distribute their thrust equally to the two rollers 10, the universal coupling permitting this adjustment to be made without any interference with the vane wheel drive.

Further, by reason of the Oldham coupling permitting the vane wheel shaft to slide parallel to itself, provision is afforded for the complete withdrawal of the section of the shaft holding the vane wheels from the shuttle, and in this way removal of the shuttle itself from the warps is greatly facilitated.

Having described our invention what we desire to secure by Letters Patent is:—

1. Circular loom of the type comprising means for positioning the shuttles by means of vane

wheels mounted in spaced relationship on a rotatable shaft so as to engage correspondingly spaced rollers in a shuttle, said loom comprising means to adjust the shaft parallel to itself and towards and away from the shuttle so as to provide correct meshing of the vane wheels with the corresponding rollers in the shuttle and a universal coupling through which the shaft may be driven in any of its adjusted positions.

2. Circular loom of the type comprising means for positioning the shuttles by means of vane wheels mounted in spaced relationship on a rotatable shaft so as to engage correspondingly spaced rollers in a shuttle, said loom comprising means to adjust the shaft parallel to itself and towards and away from the shuttle so as to provide correct meshing of the vane wheels with the corresponding rollers in the shuttle and an Oldham coupling through which the shaft may be driven in any of its adjusted positions.

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