

No. 844,377.

PATENTED FEB. 19, 1907.

A. MANN.
BRAIDING MACHINE.

APPLICATION FILED JUNE 16, 1905.

3 SHEETS—SHEET 1.

Fig. 1

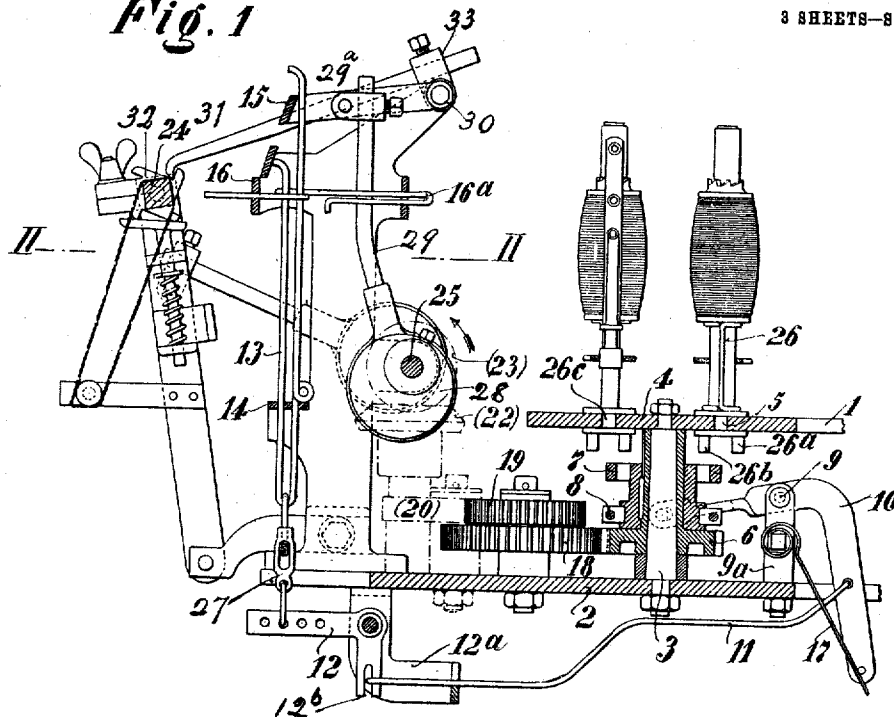
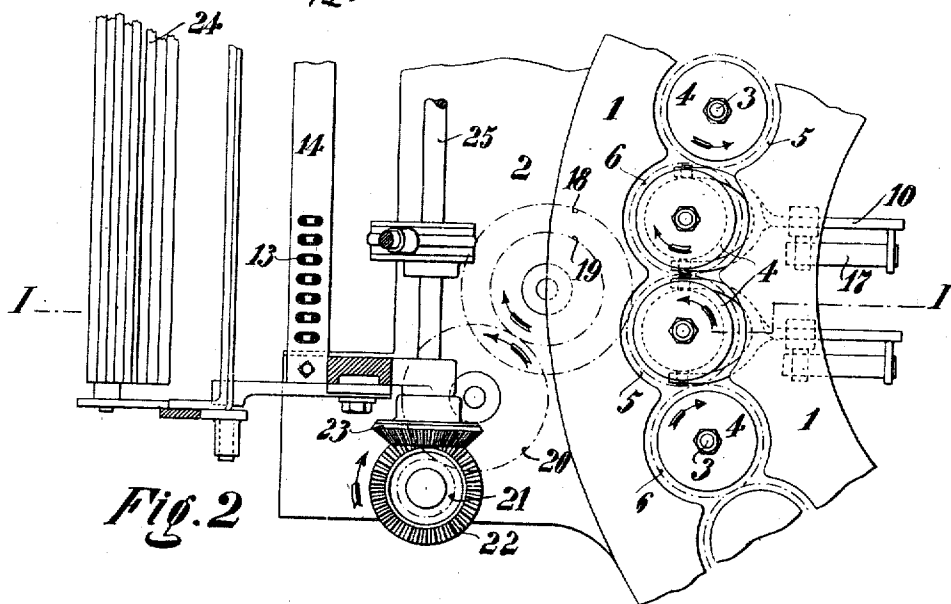


Fig. 2



Witnesses:

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3 SHEETS—SHEET 2.

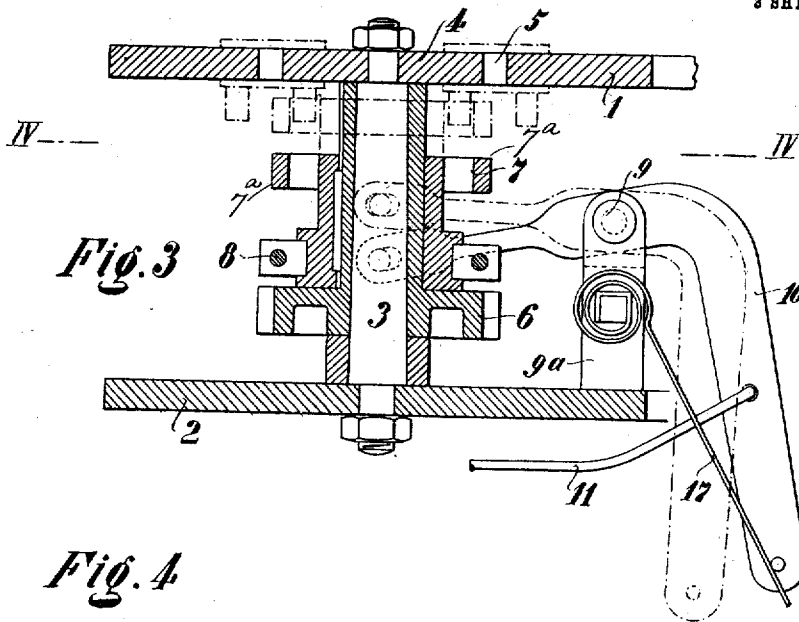
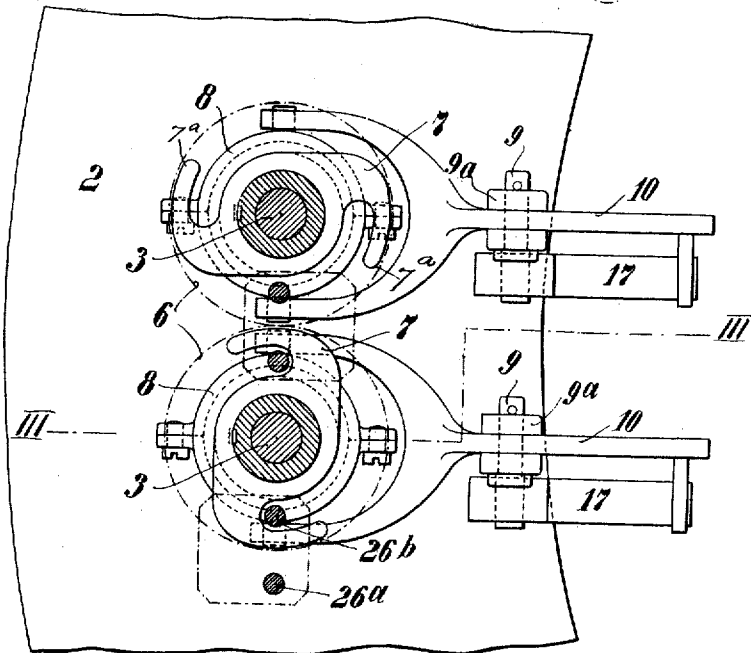


Fig. 4



Witnesses:

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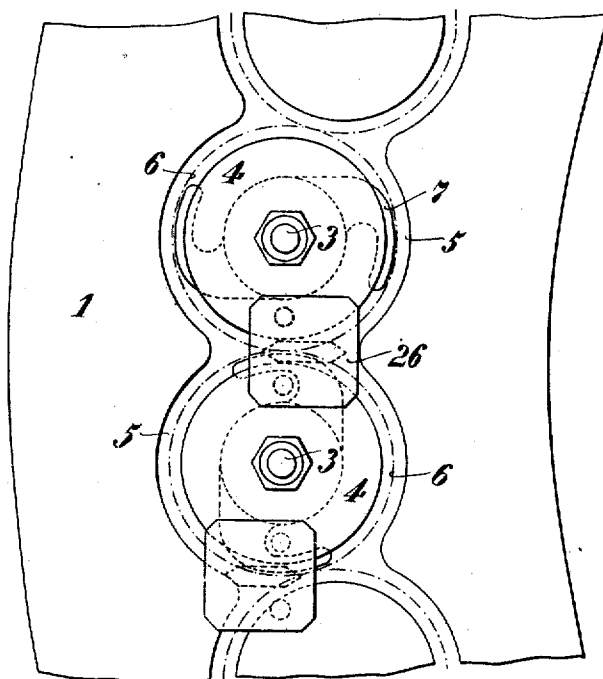
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3 SHEETS—SHEET 3.

Fig. 5



Witnesses:

Otto König
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Inventor:

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UNITED STATES PATENT OFFICE.

ADOLPH MANN, OF BARMEN, GERMANY.

BRAIDING-MACHINE.

No. 844,377.

Specification of Letters Patent.

Patented Feb. 19, 1907.

Application filed June 16, 1905. Serial No. 265,551.

To all whom it may concern:

Be it known that I, ADOLPH MANN, a citizen of the German Empire, residing at Barmen, in the Province of Rhenish Prussia and Kingdom of Prussia, have invented certain new and useful Improvements in Braiding-Machines, of which the following is a specification.

This invention relates to improvements in braiding-machines of that class where the bobbins are enabled to run from disk to disk, as usual, and where they may also be kept on one disk only, on which they are carried round for a longer or shorter period, according to the design of the lace or product to be made. In the machines used hitherto for attaining similar results the regulation of the course of the bobbins is by the use of switches and like devices. In the present invention, however, said regulation is by means of a special and peculiar construction of the drivers, which also causes the advance of the bobbins. The curved slotted paths in the upper machine-plate are of usual shape, so that a bobbin may be directed to the right or left at any crossing-point of the two slotted paths—that is to say, so that it may be shifted farther on or kept on the same plate. The drivers are constructed in the form of hooks. They are set at right angles to each other—that is to say, they change their position alternately. When the hooks of the one stand radially, those of the adjacent ones stand in the direction of the tangent to the respective central radius of the driver. The bobbin brought to the crossing place of the curve can then be taken up by the adjacent driver and carried on to the next plate, when the hook parts of the drivers have been brought in their respective positions. By these positions of the hooks the longer or shorter stay of a bobbin on a plate is decided. It remains on the same plate as long as the hook is held up, when of course the adjacent one is held down, and it is carried over to the next plate as soon as the hook on the driver carrying the bobbin is dropped and that on the adjacent driver or plate is raised. If neither of the hooks of the adjacent plates or drivers are raised, the bobbin remains still on the crossing-point between two plates.

In order to be able to regulate the working of the drivers and their hooks, as described, the regulating device, a peculiar jacquard mechanism, is so driven that its main spindle makes one complete revolution while the

bobbin-drivers make three-fourths of a revolution only. For the sake of securing a safe working of the machine and preventing the running against each other of two bobbins when their respective driver-hooks are raised and lowered, respectively, the bobbin-carriers may be provided with two downwardly-projecting studs or feet each, and the size of the driver-heads in this case may be made so that they do not reach into the paths of each other.

In the accompanying drawings I have shown so much of the improved machine as will be necessary for the understanding of the same and its working.

Figure 1 is a vertical section along line I I of Fig. 2. Fig. 2 is a view in plan of Fig. 1, partly in section along line II II of Fig. 1. Fig. 3 shows in a vertical section on line III III of Fig. 4 the construction of the gears and the device for raising and lowering the hook-drivers of the same. Fig. 4 is a horizontal section along line IV IV of Fig. 3. Fig. 5 shows part of the said machine in plan.

The same and similar parts are marked by the same numbers of reference.

By 1 is indicated the upper machine-plate. 2 is the lower plate, on which are fixed the pillars 3, carrying the disks 4, in proximity to the machine-plate 1. The inner and outer sections of this plate and the edges of the disks 4 form the curved path 5 of the bobbins. As stated above, this curve is so shaped that a bobbin located at a crossing-point may be carried round by the disk supporting it or it may be guided over to the next adjacent disk. On the pillars 3 are held movably the spur-wheels 6, which are in gear with the similar wheels of the adjacent pillars right and left. They all have long bosses on which the drivers 7 are splined, so that they may be shifted up and down thereon, though turning only with said wheels. The up-and-down movement of the drivers is caused by a ring or collar 8, placed in a circular groove of the hub of the driver, so that it can be raised and lowered by a forked bell-crank lever 10, having its fulcrum on a bolt 9, held in a bracket 9^a, fixed to the lower machine-plate. In order to cause this axial movement of the driver, the vertical arm of said lever is connected by a rod 11 to the bell-crank lever 12 of a jacquard mechanism herein described, the said rod being pivotally attached at one end to the said arm and bent at the other end to enter the slot 12^b in the

lower end of the said bell-crank lever, thereby preventing binding. A spring 17, fixed by one end to the bracket 9^a and pressing by its other end against the vertical arm of lever 10, has the tendency of keeping the driver 7 in its lowered position on the hub of the wheel 6. The said jacquard mechanism is on the whole of usual construction, and only those parts are described which had to be altered to answer the requirements of the present invention. The lifting wires 13 are indirectly connected at their lower ends by adjustable links 27 to the levers 12. In their lower position they rest on the fixed bar 14, and they can be raised by the lifting blade 15, in which position they can be kept by the fixed blade 16, a transverse lifting wire 16^a being attached to each wire 13 and arranged and adapted to rest on said part 16 when wire 13 is thus lifted, thereby preventing the descent of the latter. When the lifting wire 16^a is pushed off the blade 16, the spring 17 and the weight of the driver will cause the latter to fall down into its lower position on the hub of the wheel 6. The inner end of each lifting blade 15 is mounted on a short rock-shaft 30 on a fixed part of the machine-frame and also pivotally connected near its middle to a block or arm 29^a, adjustable on an operating-arm 29, driven by an eccentric 28 on shaft 25. The action of said shaft, eccentric, and arm is to lift and lower the blade 15 at regular intervals. Simultaneously the jacquard-cylinder 24 is turned step by step by the intermittent pull of a long pawl or feeding-arm 31, the hooked end of which engages a ratchet-wheel 32, turning with said cylinder. This arm or pawl is detachably fastened to the outer end of an arm 33 of rock-shaft 30. The drivers 7 have two hooked wings 7^a, (shown in Figs. 3 and 4,) and by these hooks they will engage the downwardly-projecting studs 26^a or 26^b of the bobbin-carrier when they are raised as indicated in dotted lines in Fig. 3. Thus the bobbin will be carried by the respective driver-hook onto its disk, and it will be carried round by the same as long as the driver is held in the raised position. The hooks of two adjacent drivers are placed at right angles to each other, as will be best seen from Figs. 4 and 5. This is necessary because the jacquard mechanism cannot simultaneously push off and lift one wire 13 to lower the driver and place another wire 13 in position for raising the next driver. By arranging the hooks of two drivers as above stated sufficient interval will be provided for raising the second driver until the bobbin has come within its reach and may therefore be seized and carried safely around by said driver.

Gear-wheels 18 19 20 21 22, Fig. 2, constitute a connecting series from one of the gear-wheels 6 aforesaid to a gear-wheel 23, turning shaft 25, and are calculated to turn

the latter shaft through an entire rotation while the wheels 6 and the wheels 7 of the braiding-machine are making three-fourths of a rotation.

The carriers 26, as will be seen from Figs. 1, 3, 4, and 5, are provided with two downwardly-projecting studs 26^a and 26^b, arranged right and left with respect to the center 26^c of the bobbin-carrier, which is guided in the curved race, so that one of them will be within reach of the driver on the left of the bobbin and the other one within reach of the driver on the right of the bobbin when said drivers are raised, and since always only one of the drivers can be raised the running together of two bobbins or the directing of one into the race curve of the other one is avoided, and very quick working of the machine is made possible. Besides this the new devices in question give almost absolute surety that the bobbins will be carried over from one disk to the other, and this especially so when the studs of the bobbin-carrier are placed somewhat out of the middle and a little toward the front side of the foot-plate of the carrier.

When in the new machine the adjacent drivers are raised and lowered alternately in regular succession, the bobbins make their course as is the case in an ordinary braiding-machine, with the only difference that the bobbins always stop for an instant at the crossing. This stoppage is, however, so minute that it will not be observed when the machine is worked at the ordinary speed. As long as a driver is raised its corresponding bobbin will be carried round on the same disk until the driver is lowered, and when a driver is lowered without raising the one of the adjacent disk then the bobbin remains stationary at the crossing-point between two disks.

Having now fully explained my new invention and paying due regard to known constructions aiming at the same result, I declare that what I claim as my invention, and desire to secure by Letters Patent, is—

1. In a braiding-machine having a lower machine-plate 2 and an upper one 1, pillars 3 fixed on the lower plate, round disks 4 carried on said pillars in proximity to the upper plate 1, and forming the wave-like bobbin-races 5 with the upper plate, in combination with driving-wheels 6 having long hubs placed rotatively on said pillars 3 each wheel meshing with those right and left of it, hook-shaped drivers 7 placed on the hubs of said wheels, rotating with the same and capable of being moved axially up and down on the same, bobbin-carriers 26 placed in said bobbin-races 5, downwardly-projecting studs 26^a, 26^b respectively at the lower side of the bobbin-carriers and means for lifting the said drivers into position to engage the said studs substantially as set forth.

2. In a braiding-machine having a lower

machine-plate 2 and an upper one 1, pillars 3
fixed on the lower plate, round disks 4 carried
by said pillars at the level of the upper plate
1, and arranged to form therewith bobbin-
5 races 5, driving-wheels 6 held rotatively on
said pillars and meshing each with its neigh-
boring wheels right and left, hook-shaped
drivers 7 carried by said wheels and movable
thereon vertically, bobbin-carriers 26 in said
10 races 5 and having downwardly-projecting
studs 26^a, 26^b to engage drivers when raised,
in combination with a forked bell-crank lever
10, held on a bracket 9^a, a ring 8 placed in a
groove round said driver 7 and engaged by
15 the forked lever 10, the bell-crank lever 12 of
jacquard mechanism a rod 11 attached at

one end to lever 10 and at the other end to
the said bell-crank lever 12 pivoted on a
bracket 12^a below plate 2, lifting wires 13
connected to said lever 12, movable lifting 20
blades 15 capable of raising said lifting wires,
stationary blades 16 holding the raised lift-
ing wires in their raised position, a cylinder
24 capable of throwing said lifting wires off
their blades 15 or 16, the whole as described 25
and illustrated and for the purpose set forth.

In testimony whereof I have affixed my
signature in presence of two witnesses.

ADOLPH MANN.

Witnesses:

OTTO KÖNIG,
J. A. RITTERSHAUS.