

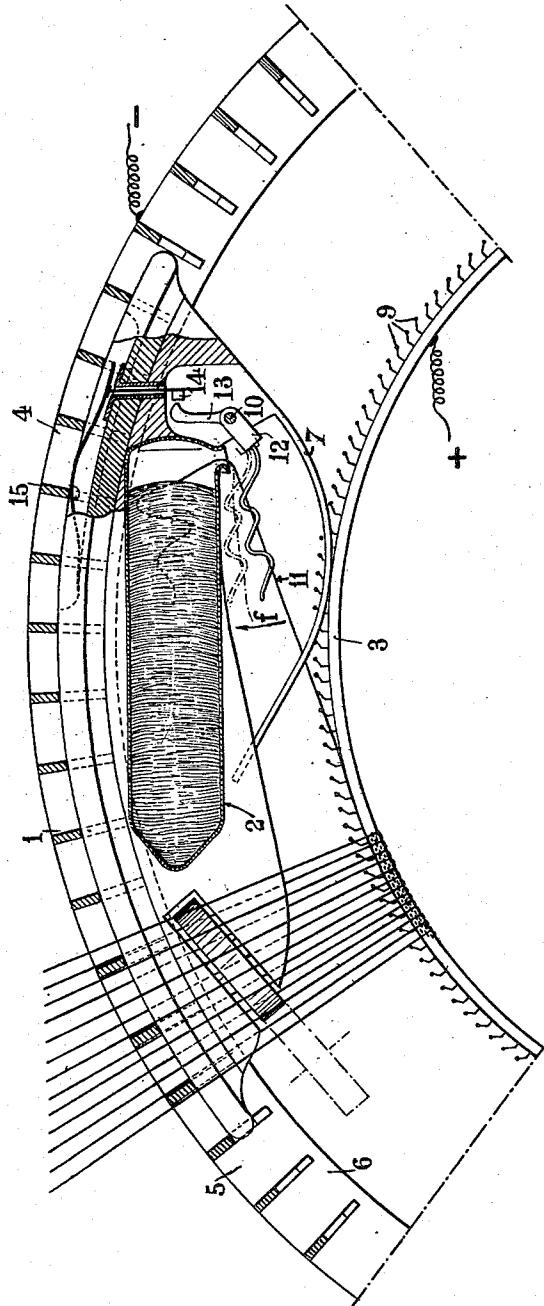
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WEFT FORK FOR CIRCULAR WEAVING LOOMS

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WEFT FORK FOR CIRCULAR WEAVING
LOOMS

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The present invention has for object a weft-fork adapted to be mounted on a circular weaving loom in order to stop the weaving when a weft thread is missed owing to its breaking or to the cop being spent.

This weft-fork essentially comprises a member pivoted on the shuttle in such a manner that, by rocking under the action of centrifugal force, it can close an electric circuit controlling one or more devices provided to stop the loom and to operate when the weaving is stopped, such as a device ensuring the uncovering of the shuttles, the disengagement of the drive for the fabric etc. Said pivoted member is normally held, by the tension of the weft which slides against it, in such a position that, notwithstanding the action of centrifugal force, the electric contact is opened; it results therefrom that said contact said pivoted member is normally held, by the breakage or exhaustion of the weft.

An important consequence of this invention consists in the fact that the circuit controlling the stoppage of the loom is closed by the weft-fork only when the loom is working and rotatively drives the shuttles, and when the weft is no longer under tension; consequently, when the loom is stopped and the weft has been tied or the cop replaced, or when the loom is stopped for any reason independent of the weft threads, the circuit remains open even before the tension of the weft is re-established, so that no difficulty whatever is encountered in restarting the loom.

The utilisation of centrifugal force for causing the closing of the circuit thus offers an essential advantage over the use of a spring the action of which is independent of the rotation of the shuttles and hinders or prevents the loom being restarted as long as the weft threads are not stretched again.

Another feature of the invention consists in the fact that the pivoted member which is carried by the shuttle and on which acts the tension of said weft thread, is shaped and arranged so that the thread passes in contact therewith by following a sinuous path and is thus subjected to the braking necessary for ensuring the required tension, without it being necessary to use the action of any other tensioning member between the cop and the point of insertion of the weft at the bottom of the shed.

An embodiment of the weft-fork according to the invention is illustrated in plan view in the accompanying drawing by way of example, in which the shuttle and its shoe are shown in partial section.

The shoe 1 rigid with the shuttle 2 is guided on a circular track concentric with the well 3 through which descends the fabric formed; this track is constituted by two crowns 4 placed at a certain distance one above the other and carrying concentric rows of pins 5 and 6 between which freely slide the upper and lower edges of the shoe. The latter is made of hard wood or other suitable insulating material, and the track guiding it, is insulated from the remainder of the loom.

The shuttle carries a metal horn 7 which is constantly electrically connected to the well 3 through the medium of flexible points 9.

On the shoe 1 is pivoted at 10, near the point where the weft 11 issues from the shuttle, a member or arm 12 of sinuous shape, provided with a contact finger 13 arranged opposite a contact-piece 14 which is mounted on the shoe and suitably insulated from the shuttle. This contact-piece is connected to a resilient wiper 15 which is secured on the outer side of the shoe and which slides against the conducting pins 5. The well 3 is connected to one of the poles of a source of low voltage current, whereas the crown 4, carrying the pins 5 is connected to the other pole.

The weft passes through the undulations of the arm 12 so that when it is stretched between the orifice of the shuttle and its point of insertion in the fabric, it prevents said arm from pivoting in the direction of the arrow *f* under the action of centrifugal force and thereby holds the finger 13 spaced from the contact-piece 14; no current can then pass from 3 to 4. As soon as the tension of the weft ceases during the operation of the shuttle, the arm 12 rocks about the pivot 10 in the direction of the arrow *f*, the finger 13 presses on the contact-piece 14 and the circuit of the source of electricity is closed through 3, 9, 7, 12, 13, 14, 15, 5 and 4.

This circuit can comprise one or more relays serving to determine the stoppage of the loom, the uncovering of the shuttle or any other useful effects.

When the mishap causing the stoppage of the loom has been remedied by tying the broken weft or by replacing the spent cop, etc., and the loom is restarted, the re-stretching of the weft by its sliding through the undulations of the arm 12 will again hold said arm spaced away, in position for opening the circuit.

It is to be understood that the loom can comprise any number of shuttles equipped in a similar manner; the stoppage of the loom will be

caused in the same way by the weft thread of any one of said shuttles ceasing to be stretched.

Without departing from the invention, the constructional details illustrated can be varied and the weft-fork described can be applied to all kinds of circular weaving looms. In particular, a light spring can be combined with said weft-fork, constantly tending to space the finger 13 from the contact-piece 14; said spring acting, as the stretched weft thread, in antagonism to the action of centrifugal force, is sufficiently weak so as not to annul the action of the latter during the operation of the loom, but sufficient to ensure the breaking of the electric circuit as long as the stopped loom is not restarted. In the case in which the speed of rotation of the loom is insufficient for the rocking of the arm 12 or the like to be always ensured upon the breaking of the weft, a spring can also be added, acting on said arm in the same direction as centrifugal force in order to ensure the projection of the finger 13 on the contact-piece 14 as soon as a breakage occurs, and furthermore, in order to avoid the vibrations of the device during normal operation. These two springs having opposed actions can moreover be used concurrently provided that the relaxation of each of them is suitably limited.

A small weight can eventually be mounted on the end of the rocking arm for increasing the effect of centrifugal force acting on said arm.

I claim:

1. In a circular weaving loom, the combination of a circular guiding track for the shuttles, said track being a conductor of electricity and electrically insulated from the body of the frame of the loom, a shuttle-carrier guided on said track, a contact member of said shuttle-carrier, adapted to rub against said guiding track, a lever pivotally mounted on said shuttle-carrier and having an arm through which a weft thread issuing from the shuttle is adapted to pass, said arm being adapted to be held by the tension of said thread in a direction oblique relatively to said circular track, a contact finger rotatively connected to said lever and adapted to come in contact with said contact piece on the shuttle-carrier when centrifugal force causes said lever to pivot, the shuttle-carrier having a conducting horn electrically connected to said contact finger and adapted to constantly rub against a cir-

cular row of members connected to the body of the frame of the loom.

2. In a circular weaving loom, the combination of a circular guiding track for the shuttles, said track being a conductor of electricity and electrically insulated from the body of the frame of the loom, a shuttle-carrier guided on said track, a contact member on said shuttle-carrier, adapted to rub against said guiding track, a lever pivotally mounted on said shuttle-carrier and having an arm of sinuous shape through which a weft thread issuing from the shuttle is adapted to pass with friction, said arm being adapted to be held by the tension of said thread in a direction oblique relatively to said circular track, a contact finger rotatively connected to said lever and adapted to come in contact with said contact piece on the shuttle-carrier when centrifugal force causes said lever to pivot, the shuttle-carrier having a conducting horn electrically connected to said contact finger and adapted to constantly rub against a circular row of members connected to the body of the frame of the loom.

3. In a circular weaving loom, the combination of a circular guiding track for the shuttles, said track being a conductor of electricity and electrically insulated from the body of the frame of the loom, a shuttle-carrier guided on said track, a contact member on said shuttle-carrier, adapted to rub against said guiding track, a lever pivotally mounted on said shuttle-carrier and having an arm through which a weft thread issuing from the shuttle is adapted to pass, said arm being adapted to be held by the tension of said thread in a direction oblique relatively to said circular track, a contact finger rotatively connected to said lever and adapted to come in contact with said contact piece on the shuttle-carrier when centrifugal force causes said lever to pivot, the shuttle-carrier having a conducting horn electrically connected to said contact finger and adapted to constantly rub against a circular row of members connected to the body of the frame of the loom, said members being constituted by flexible points which are secured on a ring outside the shed and which pass between the warp threads so as to penetrate within the shed and to be rubbed by said horn.

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