A. G. KOECHLIN.

AUTOMATIC WEFT SPOOL CHANGING APPARATUS FOR POWER LOOMS.

APPLICATION FILED JUNE 17, 1911.

1,011,969. Patented Dec. 19, 1911.

Fig. 1

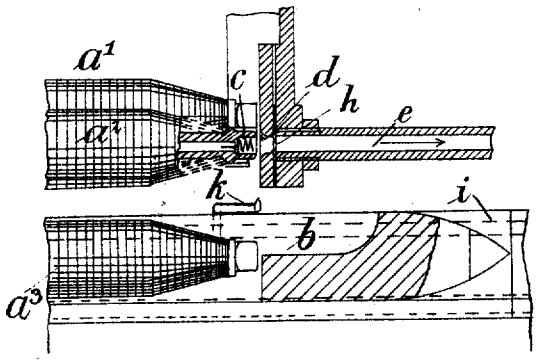


Fig. 2

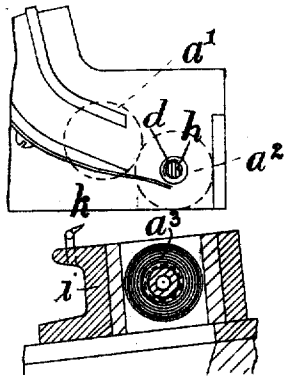


Fig. 3

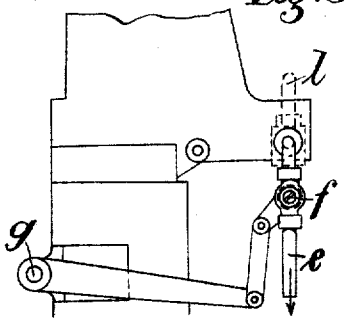
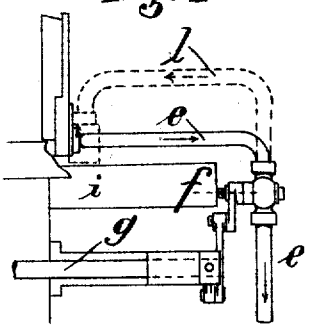


Fig. 4



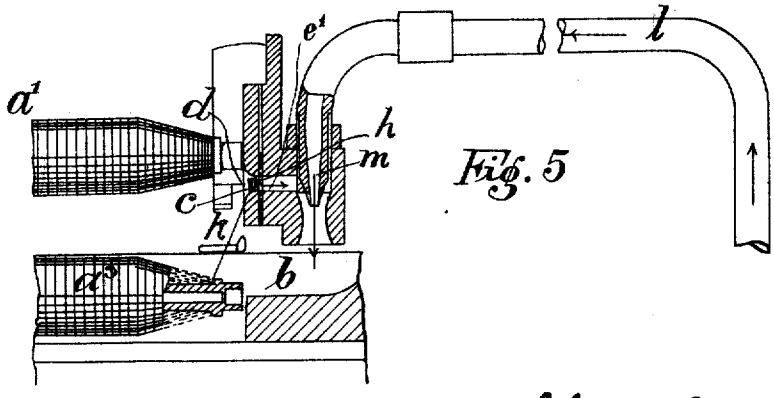


Fig. 5

Witnesses: Fredk. R. Curtice
Joseph F. Sullivan

Albert Georg Koechlin
Inventor:
by Edwardson Marble
Attorneys.

UNITED STATES PATENT OFFICE.

ALBERT GEORG KOECHLIN, OF STEINEN, GERMANY, ASSIGNOR TO GENOSSENSCHAFT FUR TEXTILPATENTE, G. M. B. H., OF BASEL, SWITZERLAND.

AUTOMATIC WEFT-SPOOL-CHANGING APPARATUS FOR POWER-LOOMS.

1,011,969. Specification of Letters Patent. Patented Dec. 19, 1911.

Application filed June 17, 1911. Serial No. 633,709.

To all whom it may concern:

Be it known that I, ALBERT GEORG KOECHLIN, a citizen of Switzerland, and residing at Steinen, in the Grand Duchy of Baden, in the German Empire, have invented certain new and useful Improvements in Automatic Weft-Spool-Changing Apparatus for Power-Looms, of which the following is a specification.

This invention relates to automatic weft spool changing apparatus for power looms of the class in which the loose end of the spool thread is drawn by automatic means from the fresh spool before the insertion of the latter in the shuttle. In one construction of apparatus of that class the loose end of the spool thread is wound a few turns on a detachable cap mounted on the spool tube and is drawn from the spool by the action of a jet of compressed air which blows off the said cap together with the few turns of thread wound thereon.

The present invention has now for its object to provide improved mechanism of this class in which the loose end of the spool thread is drawn off by means of suction, for which purpose the aforesaid detachable cap is dispensed with and the few turns of the loose end are coiled inside the open nose of the spool tube.

In carrying out this invention the necessary suction may be produced by means of an air pump to which the suction ducts of all the looms are connected, driven from the weaving room shafting or by a special motor. Or, each loom may be fitted with its own small air pump driven from the loom itself. Or, a current of compressed air or any other means may be employed for producing the necessary suction.

In the accompanying drawings:—Figure 1 is a sectional elevation of one form of the improved apparatus, and Fig. 2 is a cross section thereto. Figs. 3 and 4 are respectively end and side elevations of mechanism for controlling the operation of the suction. Fig. 5 is a sectional elevation of a modified form of the improved apparatus.

Referring first to Figs. 1 to 4 inclusive, Figs. 1 and 2 show three spools, namely, a spool a' coming from the spool magazine ready to be operated on by the improved apparatus, a spool a^2 under operation by the improved apparatus, and a spool a^3 in the loom shuttle b after the operation of the improved apparatus. Each spool comprises a spool tube inside the open nose of which the loose end of the spool thread is coiled a few turns as indicated at c.

d is the inlet of a suction pipe e connected to a suction-producing device (not shown).

f is a cock in the suction pipe e; g is a rocking shaft operated or controlled by the loom weft-feeler (not shown) as described in the U. S. Patent No. 971,541 of 1910 granted to me.

h is a wire cloth strainer in the inlet of the suction pipe e; and i is the loom slay provided with a hook k. Preferably, the cock f is normally closed, and the desired vacuum in the suction pipe e is produced just before the fresh spool is to be inserted in the shuttle.

The operation of the improved apparatus is as follows:—When a fresh spool has moved into the position indicated by a^2 ready to be placed in the shuttle b, its open nose containing the few turns c of spool thread is situated in front of the inlet d of the suction pipe e. As soon as the thread in the shuttle becomes exhausted the shaft g is rocked as a result thereof in such a manner as to open the cock f. Immediately the suction in the suction pipe e acts upon the spool thread turns c which are thereby sucked out of the open nose of the spool tube into the inlet d where they are held firmly against the strainer h. Then the spool is placed in the loom shuttle as indicated at a^3 and the shuttle is then thrown first to the left and then back into the position shown in Fig. 5, by which means as much thread is drawn off the spool as will allow the shuttle to be threaded during this movement. Thereupon the shaft g is rocked back, so as to close the cock f to shut off the suction in the pipe e from the inlet d and thus allow the spool thread turns c to be readily detached from the strainer h. Then the loom slay i in its return movement causes the hook k to engage and break the portion of the spool thread leading from the turns c to the spool a^3 in the shuttle and whereby the loose end of thread hanging from the small hook k may now be brought into contact with a rapidly rotating spindle which winds it around itself or it can be allowed to fall to the ground or drop into a receptacle placed

underneath, in fact in any way so as to prevent the loose end from being drawn into the fabric by the movement of the slay.

In the modification illustrated in Fig. 5, the suction pipe is reduced in length to a short passage e' opening into a chamber surrounding the nozzle m of a compressed air pipe l and the suction is produced by the ejector action of the jet of compressed air issuing from the nozzle m.

The operation of the compressed air jet is controlled by a cock in the pipe l operated from the loom rocking shaft g as in the modification just hereinbefore described.

Having now described my invention what I claim as new and desire to secure by Letters Patent is:—

1. In automatic weft spool changing apparatus for looms, the combination with a spool having a few turns of the loose end of the spool thread coiled inside the open nose of its spool tube and a rocking shaft actuated by the weft feeler of the loom of a suction duct having its inlet directed toward the nose of the spool when the latter is in position for threading the spool thread in the loom shuttle, a cock controlling the suction in said suction duct, and connections between said cock and said rocking shaft, whereby just before the spool is to be inserted into the loom shuttle, the said cock is opened by the actuation of said rocking shaft and the resulting suction sucks the coiled loose end of the spool thread into the inlet of the suction duct, wherein said loose end is held until the spool has been inserted into the loom shuttle as set forth.

2. In automatic weft spool changing apparatus for looms, the combination with a spool having a few turns of the loose end of the spool thread coiled inside the open nose of its spool tube and a rocking shaft actuated by the weft feeler of the loom of a suction duct having its inlet directed toward the nose of the spool when the latter is in position for threading the spool thread in the loom shuttle, a strainer in said inlet, a cock controlling the suction in said suction duct, and connections between said cock and said rocking shaft, whereby just before the spool is to be inserted into the loom shuttle, the said cock is opened by the actuation of said rocking shaft and the resulting suction sucks the coiled loose end of the spool thread into the inlet of the suction duct, wherein said loose end is held against said strainer, until the spool has been inserted into the loom shuttle as set forth.

3. In automatic weft spool changing apparatus for looms, the combination with a spool having a few turns of the loose end of the spool thread coiled inside the open nose of its spool tube, and a rocking shaft actuated by the weft feeler of the loom, of a suction duct having its inlet directed toward the nose of the spool, a compressed air ejector delivering into said suction duct away from its inlet, a cock controlling the operation of the compressed air ejector, and connections between said cock and said rocking shaft, whereby just before the spool is to be inserted into the loom shuttle, the said cock is opened by the actuation of the said rocking shaft to operate the compressed air ejector to create an inward suction through the inlet of said suction duct whereby the coiled loose end of the spool thread is sucked into the inlet of said suction duct as set forth.

4. In automatic weft spool changing apparatus for looms, the combination with a spool having a few turns of the loose end of the spool thread coiled inside the open nose of its spool tube, and a rocking shaft actuated by the weft feeler of the loom, of a suction duct having its inlet directed toward the nose of the spool, a strainer in said inlet, a compressed air ejector delivering into said suction duct behind said strainer away from its inlet, a cock controlling the operation of the compressed air ejector, and connections between said cock and said rocking shaft, whereby just before the spool is to be inserted into the loom shuttle, the said cock is opened by the actuation of the said rocking shaft to operate the compressed air ejector to create an inward suction through the inlet of said suction duct, whereby the coiled loose end of the spool thread is sucked against the strainer in said inlet of said suction duct as set forth.

5. In automatic weft spool changing apparatus for looms, the combination with a spool having a few turns of the loose end of the spool thread coiled inside the open nose of its spool tube, a rocking shaft actuated by the weft feeler of the loom, and the loom slay of a hooked part on the loom slay, a suction duct, cock controlling the suction in said suction duct, and connections between said cock and said rocking shaft, whereby said cock is first opened to allow the resulting suction to draw the coiled loose end of the spool thread into the inlet of said suction duct, and then on the closing of said cock the loom slay in its return movement causes the said hooked part to engage the loose end of the spool thread and remove the same from said inlet as set forth.

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

ALBERT GEORG KOECHLIN.

Witnesses:

AUGUST OOSTERMAN,

MARIX HÄTTIG.