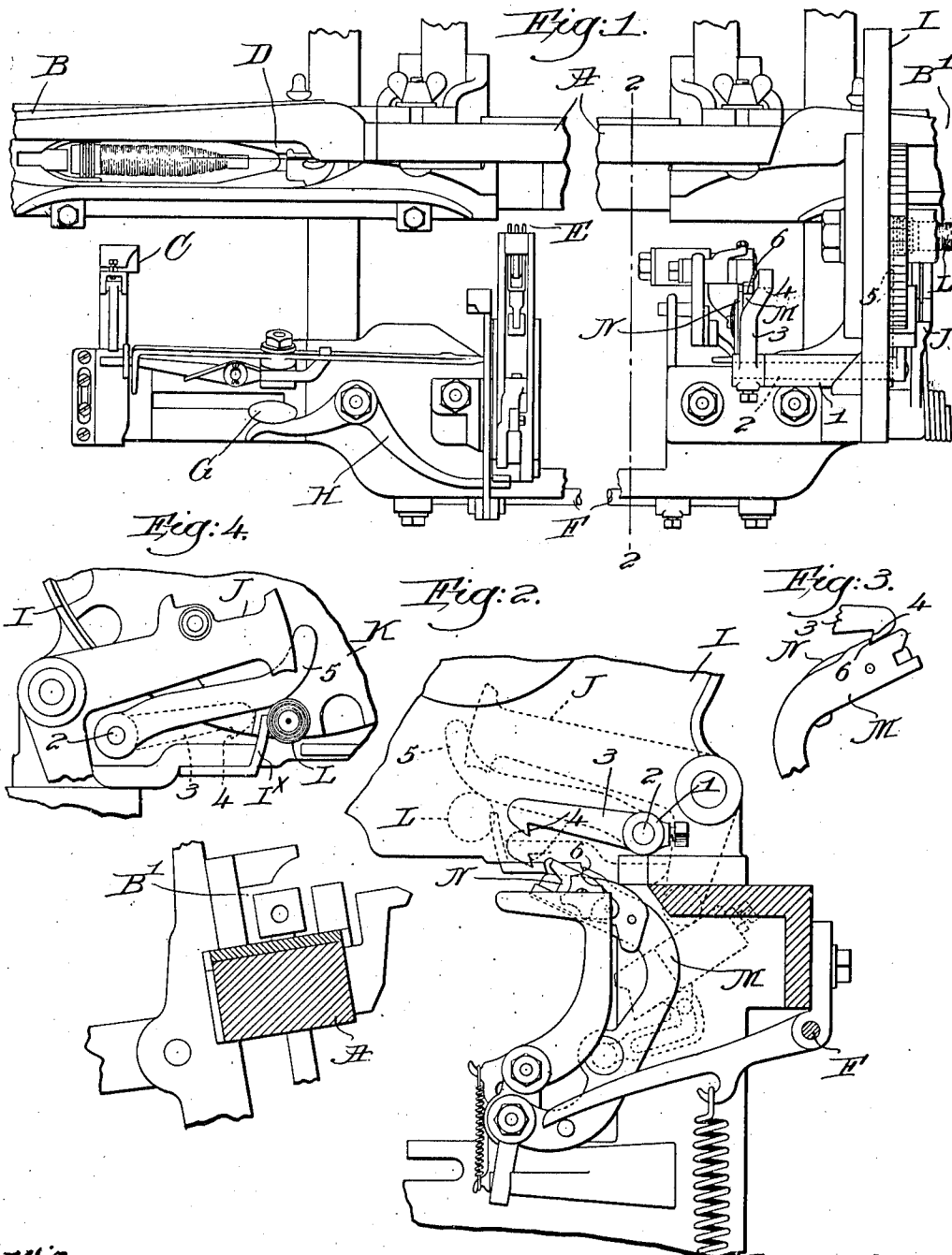


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CONTROLLING MECHANISM FOR AUTOMATIC FEELER LOOMS.
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1,020,622.

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UNITED STATES PATENT OFFICE.

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CONTROLLING MECHANISM FOR AUTOMATIC FEELER-LOOMS.

1,020,622.

Specification of Letters Patent.

Patented Mar. 19, 1912.

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To all whom it may concern:

Be it known that I, ALONZO E. RHOADES, a citizen of the United States, and resident of Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in Controlling Mechanism for Automatic Feeler-Looms, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates particularly to looms wherein the filling in the working shuttle is replenished automatically prior to complete exhaustion by or through the operation of a feeler mechanism, which mechanism acts when predetermined filling exhaustion is reached. When said mechanism becomes active a fresh supply of filling is transferred automatically to the shuttle from a magazine or hopper in which the reserve supply of filling is stored, and in the well-known Northrop loom the reserve filling-carriers or bobbins are contained in a hopper at one side of the loom. The provision of feeler mechanism to such a loom usually, though not necessarily, involves the location of the feeler proper at the opposite side of the loom, as for instance is shown in United States Patent No. 789,472 granted May 9, 1905 to Wood and Northrop. Inasmuch as the feeler mechanism is designed to effect a change of filling prior to complete exhaustion of the filling, to prevent empty or partly empty picks in the cloth, breakage of the running filling is detected by a suitable detecting instrumentality, which may be arranged to stop the loom when filling breakage is detected. Feeler looms of the type referred to are also often provided with means to part the outgoing filling between the cloth and the shuttle box at the filling changing side of the loom, so that the filling end will not be left where it may be taken back and woven into the cloth. A thread-parting mechanism of this general character is shown in United States Patent No. 683,423 granted September 24, 1901 to C. H. Draper.

In a fully equipped automatic feeler loom such as has been outlined a peculiar fault of operation is sometimes found to exist, primarily due to inattention on the part of the weaver in allowing the hopper to become completely empty of reserve filling supplies. Let it be supposed that the loom is in opera-

tion, and the last of the filling supplies has been transferred from the hopper and is in the working shuttle. As the supply of filling therein diminishes the feeler mechanism approaches nearer and nearer its active period, and when the predetermined exhaustion of filling is detected by such mechanism it becomes active, calling into operation not only the transferring device but also bringing the thread-parting mechanism into action to part the filling between the cloth and the shuttle when the latter is boxed at the replenishing side of the loom. There is no replenishment of filling, however, as the hopper is empty, hence the shuttle is picked to the feeling side of the loom with the parted filling-end trailing after it, and usually this trailing end is caught in the shed part way across so that the filling-detector or fork will detect presence of filling when the shuttle is boxed at the feeling side of the loom. Consequently there will be no stoppage of the loom, but the cloth will contain a pick containing filling extending only a part of the way from one to the other selvage, and the feeler mechanism will again act, so that when the shuttle reaches the replenishing box the transfer device and thread-parting mechanism will be again brought into operation, with another parting of the filling. Again the shuttle is picked to the feeling side, and again a partly empty pick will be formed in the cloth, the intervening pick being a full one. This cycle may be repeated until the filling actually runs out and the filling-detector detects absence of filling and causes stoppage of the loom. The damage has been done, however, and the weaver must pick out the faulty portion of cloth until the perfect cloth is reached, before restarting the loom, causing loss of production of the particular loom involved, to say nothing of loss of production of any other looms of the set which may have stopped from one cause or another while the weaver has been picking out.

My present invention has for its object the production of very simple and efficient means to prevent, primarily, the operation of the thread-parting mechanism, and secondarily, to prevent the operation of the replenishing mechanism, when filling replenishment is called for and there is no filling-carrier positioned for transfer from the hopper. Such arrest of operation of the thread-

parting mechanism enables the shuttle to lay the filling continuously until it runs out and the loom is stopped. As long as the filling is present the cloth will be woven properly, and even should the filling extend only part-way across the cloth on the last pick it can be quickly picked out, for then the weaving is promptly stopped. The operation of the filling replenishing mechanism without replenishing the supply in the shuttle is objectionable because unnecessary, though it does not injure the cloth, but in a feeler loom the thread-parting mechanism must be held from operation if the filling in the shuttle is not replenished, or faulty cloth will be produced.

The various novel features of my invention will be fully described in the subjoined specification and particularly pointed out in the following claims.

Figure 1 is a top plan view, broken out at each side and centrally, of a sufficient portion of an automatic filling-replenishing feeler loom, with one embodiment of my present invention applied thereto; Fig. 2 is an enlarged cross-sectional detail on the line 2—2, Fig. 1, looking toward the right, to illustrate more clearly the construction and operation of the apparatus; Fig. 3 is a detail of the end of the shuttle-feeler on which the thread-parting mechanism is mounted, to be referred to hereinafter; Fig. 4 is a detail showing a part of the inner end of the hopper, and the means for preventing the operation of the thread-parting mechanism when certain contingencies arise.

The lay A having shuttle-boxes B, B' thereon, the front wall of the box B having the usual opening for the intermittent entrance of the filling feeler C into the shuttle D through a usual aperture in its side wall; the filling-detecting mechanism located at the feeling side of the loom and including the detector or fork E, to detect presence or absence of filling when the shuttle is in the box B; the rock-shaft F which controls the operation of the replenishing mechanism, and the transmitting connections between said rock-shaft and the feeler C, the shipper G and knock-off arm H adapted to be actuated to stop the loom when filling-absence is detected by the detector E, may be and are all of well known construction, and are substantially as in the Wood and Northrop patent referred to. So, too, the filling-replenishing mechanism is substantially as shown in said patent and comprises essentially a magazine or hopper rotatably mounted on a stand I and sustaining the reserve supplies of filling, and a rocking transferrer J to transfer such supplies one by one from the hopper to the shuttle when the latter is in the box B' and filling replenishment is called for, the inner or butt supporting plate K of the hopper

being shown in Fig. 4. A filling-carrier or bobbin positioned in the hopper for transfer is indicated at L, Figs. 1, 2 and 4. A shuttle-feeler and thread-parting mechanism is located at the replenishing side of the loom, such as substantially shown in the Draper patent, above noted, the shuttle-feeler M being mounted to swing rearward into operative position adjacent the mouth of the shuttle-box B' if the shuttle is properly boxed therein when filling-replenishment is called for by the feeler mechanism. The thread-parting mechanism indicated as a whole at N, is mounted on the feeler and said parts have a bodily movement to the right, Fig. 1, when moved into operative position, as in the Draper patent.

As all of the mechanism thus far referred to are well known and familiar in construction and operation to those skilled in the art no detailed description thereof is necessary, but attention is directed to the fact that when filling-replenishment is called for by the feeler mechanism the rock-shaft F is turned and ordinarily the shuttle-feeler will move the thread-parting mechanism to operative position, prior to the operation of the transferrer J. Also, it should be stated that the parting mechanism will be operated on the forward beat of the lay to part the filling between the cloth and the shuttle when the latter is boxed for replenishment, whether or not a fresh filling-carrier is inserted in the shuttle, in the structures referred to. If the hopper is empty or there is no filling-carrier therein positioned for transfer there will be no change of filling, and the quantity of filling remaining in the shuttle after the operation of the thread-parting mechanism N may be quite considerable, so that as the shuttle is picked from the box B' the filling-end will trail behind and will usually be caught in the shed partway across. Then the detector E will detect the presence of filling as the shuttle enters box B, Fig. 1, and the feeler C will again call for filling replenishment, so that the transferrer and the thread-parting mechanism will again operate when the shuttle reaches the box B', as before described. This cycle of operation makes a partly filled pick in the cloth on the flight of the shuttle from right to left, and a full pick on the return flight, the cycle repeating until the filling in the shuttle runs out and its absence is finally detected by the fork E, whereupon the loom is stopped, and the bad cloth must be picked out by the weaver.

I will now describe means for preventing such objectionable action, in accordance with my invention. The stand I is provided at its inner side with a hub-like bearing 1, Fig. 1, in which is mounted a rock-shaft 2 parallel to the axis of the transferrer J, the inner end of said shaft having attached to it

a rearwardly extended, bent arm 3 having at its end a downward hook 4. At its outer end the rock-shaft 2 has attached to it a rearwardly extended and up-curved arm 5 adjacent the outer face of the butt supporting plate K of the hopper, said arm resting upon and being upheld in normal position by the butt of a filling-carrier L in transferring position. When the arm 5 is thus upheld it operates through the rock-shaft 2 to hold the arm 3 uplifted in the position shown in the drawings, but if the hopper is empty or there is no filling-carrier in transferring position the weight of the arms 3 and 5 causes them to descend until the hooked end 4 of arm 3 is in dotted line position, Fig. 2. This brings the hooked end 4 into the path of movement of a shoulder 6 on the shuttle-feeler M as the latter is moved toward operative position when filling replenishment is called for, and thereby said shuttle-feeler will be arrested, see Fig. 3, before it has reached the point at which the parting mechanism N can part the thread. Hence the old filling end will not be parted when the shuttle is boxed at B', and as the shuttle-feeler is held from its full rearward movement it acts through the usual means to prevent the operation of the replenishing mechanism, practically as if the shuttle were improperly boxed for replenishment. The withholding from operation of the thread-parting mechanism when such operation is called for by the feeler mechanism is the important feature, as thereby the shuttle will continue to lay the filling without a break until it runs out and the loom is stopped, but the prevention of a barren operation of the replenishing mechanism is highly desirable, and this results from the non-operation of the parting mechanism, as will be manifest. As the arm 3 when in active position restrains the thread-parting mechanism from operating such arm may be termed the detent member, and the arm 5 is termed the detector member, or detector, as it detects the presence or absence of a filling-carrier in transferring position in the hopper, and such member 5 controls the member 3 as to its active or inactive position. The curved rear end of the detector 5 enables the butts of the filling-carriers to move thereunder easily as the hopper is moved intermittently to present the filling-carriers one by one to transferring position. Descent of the detector 5 to actively position the detent member 3 is limited by the part of the hopper stand I which sustains the abutment

I', the detector at such time descending between the end plate K of the hopper and the adjacent end of the abutment. The detent 3 is bent or offset as shown in Fig. 1 so as to bring its hooked end 4 into the path of movement of the shoulder 6 on the shuttle-feeler.

As will be seen the controlling means embodying my invention is of simple construction, adds very little to the loom structure, and is direct and effective in its operation.

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

In a loom, in combination, filling-replenishing mechanism having a hopper to contain a plurality of filling-carriers, and a transferer to transfer them singly to the shuttle prior to complete exhaustion of the filling therein, a thread-parting mechanism normally operating to part the old filling when the operation of the replenishing mechanism is called for, a swinging support for said thread-parting mechanism, provided with a shoulder, and means, maintained inactive by or through coöperation with a filling carrier positioned for transfer, to prevent the operation of the thread-parting mechanism if no filling-carrier is in transferring position, said means comprising a rock-shaft mounted on a fixed part of the hopper, a detent member having a hooked end adapted to engage the shoulder of the swinging support, and a detector, both fixedly attached to said rock shaft, the detector being extended rearwardly to rest upon the butt of a filling-carrier is transferable position and being thereby upheld to maintain the hooked end of the detent member out of engagement with the shoulder on the swinging support, absence of a filling carrier in transferring position permitting the detector to descend and turn said rock shaft and thereby lower the hooked end of and operatively position the detent member, the rear end of the detector being upcurved to enable the butts of successive filling carriers to move easily thereunder and uphold the detector as said filling carriers are positioned for transfer.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

ALONZO E. RHOADES.

Witnesses:

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