April 7, 1936. K. B. COOK 2,036,744

METHOD AND APPARATUS FOR SETTING UP A SLASHER

Filed April 12, 1935 2 Sheets-Sheet 1

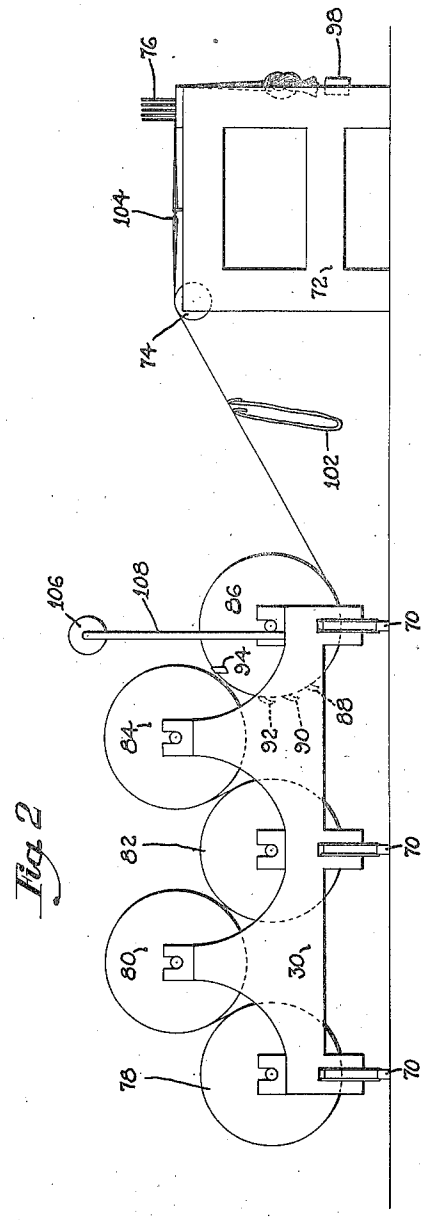


Fig. 2

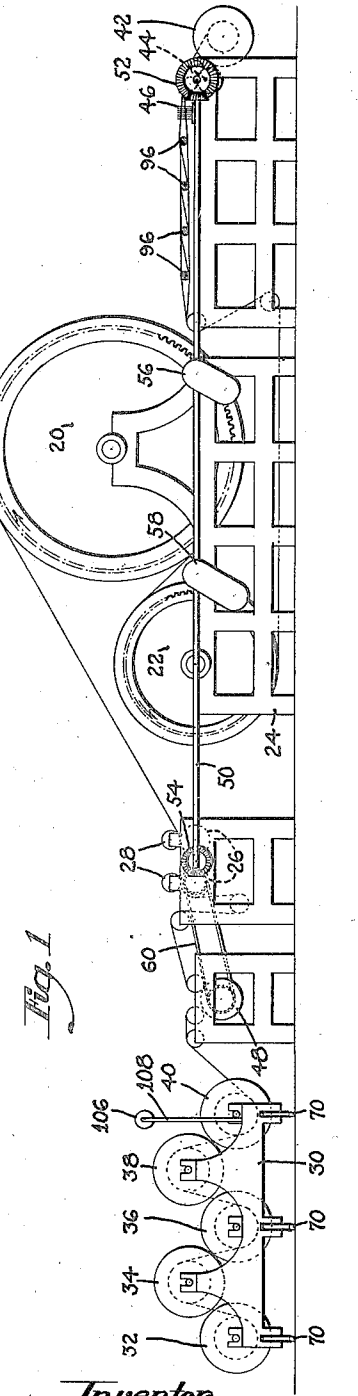


Fig. 1

Witness
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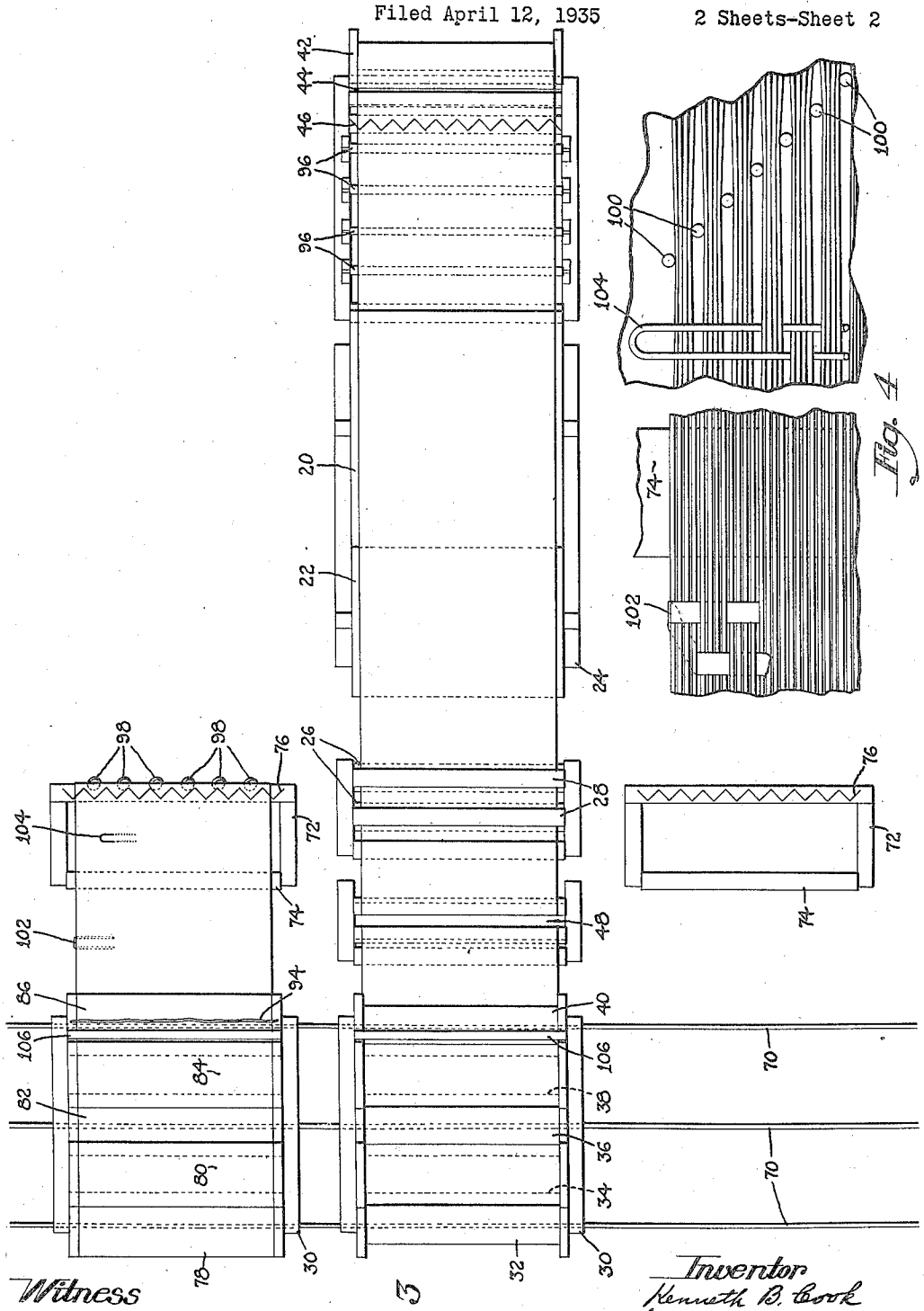


Fig. 3

Fig. 4

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UNITED STATES PATENT OFFICE

2,036,744

METHOD AND APPARATUS FOR SETTING UP A SLASHER

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Application April 12, 1935, Serial No. 16,029

7 Claims. (Cl. 28—28)

The present invention relates to an improved method and apparatus for setting up a slasher for operation upon a new warp.

In the operation of a slasher the threads or ends which comprise the warp are drawn from a number of section beams of a creel in the form of a flat sheet which is passed through the sizing device, around one or more drying drums where the sizing material is baked onto the threads, and are finally wound onto a warp beam at the front end of the machine ready for weaving. These threads or ends must occupy a substantially parallel relationship during the passage of the warp through the slasher, and more particularly as they are wound onto the warp beam, for satisfactory operation when they are later threaded into the heddles or harnesses of the loom for weaving. In order to facilitate guiding the threads and to insure that they are maintained in the required parallel relationship as they are wound onto the warp beam, it is customary to pass the threads in groups or sheaths through the dents of a separating comb mounted on the forward end of the machine from whence they pass around the take-up feed roller to the warp beam.

In the setting up of a machine of this type for operation with a new group of section beams, it is the usual practice to draw the threads or ends of the new beams from the creel, tie them in bunches to the ends severed from the exhausted beams, and then turn over the machine so that the new ends are drawn through the machine to the separating comb above referred to. The new ends are then "counted in", which consists in arranging the threads in their proper order and with the proper number in each of the dents of the comb, and are attached to a fresh warp beam. The machine is now ready to be started.

The process of drawing the new ends from the creel, and more particularly of counting in the new ends in the separating comb at the forward end of the machine, is a long and tedious business which may keep the machine idle consecutively from two to eight hours depending upon the number of ends in the set, and upon whether colored yarns are to be used.

It is the object of the present invention to provide a novel and improved method and apparatus for employing the same which will permit the setting up of the slasher for operation upon a new warp or set to be accomplished in a small fraction of the time previously required, so that the machine may be kept substantially in continuous operation with the corresponding improvement in efficiency and economy of operation.

With this and other objects in view, as may hereinafter appear, the several steps of the method employed, and the several features of the apparatus utilized in setting up a slasher for operation with a new set of section beams as hereinafter described and claimed, will be readily understood by one skilled in the art from the following description taken in connection with the accompanying drawings, in which Fig. 1 is a somewhat diagrammatic view in side elevation of a slasher, only so much of the machine being shown as is necessary to illustrate the manner in which the applicant's method is applied thereto for the setting up of the slasher for operation upon a fresh set of section beams; Fig. 2 is a view on an enlarged scale of a creel and a counting-in frame associated therewith to illustrate certain steps of applicant's method and disclosing in a preferred form the several features of the apparatus employed in connection therewith; Fig. 3 is a somewhat diagrammatic plan view of a slasher having the general organization of parts shown in Fig. 1, and illustrating particularly an alternate creel, together with two counting-in frames and a supporting track on which the creels may be moved readily into and out of operative position with relation to the machine; and Fig. 4 is a fragmentary plan view on a greatly enlarged scale, showing the manner in which the threads are counted in in sheaths on the comb of the counting-in frame and leased for subsequent placing in the separating comb at the forward end of the machine.

The drawings disclose a slasher of the type disclosed in the patent to Slipp, No. 1,553,443, dated September 15, 1925, and in the patent to Cook, No. 1,944,221, dated January 23, 1934, together with novel apparatus which is well adapted to assist the operator in the practice of the method of the present invention, and which embodies certain features of invention as hereinafter to be more fully set forth.

While the slasher herein illustrated is particularly well adapted for the practice of the several steps of applicant's method, it is to be understood that applicant's method of setting up the slasher for operation is equally applicable for setting up slashers of other types, in which the new threads or ends must be sorted or counted in to pass through a supporting comb at the forward end of the machine for winding onto the usual warp beam.

Referring more specifically to the drawings, Fig. 1 is a somewhat diagrammatic view in side elevation of a preferred type of slasher which comprises a main drying drum 20, a smaller drum 22 mounted on a frame 24, a size bath having two size rollers 26 and cooperating press rollers 28, a creel 30 having supported thereon a plurality of section beams indicated generally at 32, 34, 36, 38 and 40 respectively, a warp beam 42 onto which the warp is wound, a warp feeding device comprising a feed roll 44, and a separating comb 46 mounted adjacent to the warp beam 42 at the forward end of the machine. There is also mounted between the creel and the size bath a warp stretch control device which includes a positively driven draw-off feed roll 48 for drawing the ends or threads from the several section beams of the creel 30. The feed roll 44, the drums 20 and 22, the size rolls 26 and the stretch control feed roll 48 are all driven in timed relation through driving means which may be of any ordinary description, but are herein disclosed as comprising a drive shaft 50 extending along the side of the machine, and connected at one end through a bevel gear and pinion 52 to the drive for the feed roll 44, and at its other end through a bevel gear and pinion 54 to the size rolls 28. The drums 20 and 22 are respectively driven from the shaft 50 through gear connections not shown which are housed respectively in gear boxes 56 and 58. The stretch control feed roll 48 is driven from one of the size rolls 26 through a chain drive generally indicated at 60.

To facilitate the practice of the applicant's method of setting up the slasher for operation upon a new warp, the slasher shown in the drawings is provided with two creels which are mounted on cross rails 70, so that the creels can be moved alternatively into and out of operative position at the rear of the slasher. With the present machine there are also provided, as best shown in Figs. 2 and 3, two counting-in frames 72 which are located one at each side of the slasher for use in connection with the spare creel to prepare a new warp for setting up on the slasher. Each of the frames 72 is provided with a guide roll 74 and a counting-in comb 76 which has teeth equal in number to the teeth of the separating comb 46 mounted on the forward end of the slasher. The relative positions of the spare creel and the counting-in frame for setting up a new warp during the continued operation of the slasher with the alternate creel, is clearly shown in Figs. 2 and 3.

The several steps of applicant's novel and improved method of setting up the slasher for operation upon a new warp may be described as follows:—

It may be assumed that fresh section beams have been placed on the spare creel. The threads are first drawn off therefrom in accordance with the usual practice where the creel is permanently mounted behind the machine. The ends from the last section beam in line designated at 78 (Fig. 2) are drawn over the section beam 80 where the additional ends are picked up and drawn around the section beam 82. In a similar manner the ends are drawn around the section beams 84 and 86, the additional ends from each added beam being picked up to form the entire warp. Further, in accordance with the usual practice, lease strings are laid consecutively between the threads or ends of each section beam and those added thereto from previous beam or beams as the ends are drawn through the creel, so that the ends from each section beam can later be split or separated from the ends of each of the other section beams. The manner in which these lease strings are laid in is clearly shown in Fig. 2, in which lease strings 88, 90 and 92 are indicated in dotted lines, having been laid in consecutively as the ends pass onto the section beams 80, 82 and 84 respectively. A lease string 94 as shown, has been laid onto the section beam 86, so that when the ends are subsequently drawn still further through the creel, the ends from the section beam 86 will be similarly separated out from the ends of the previous beams on the creel. These lease strings are subsequently drawn through the slasher with the warp, and serve to enable the operator in setting up the machine to position the lease rods 96 through the warp to split the threads or ends which may have become stuck together during the sizing and subsequent drying operation on the drums 20 and 22.

The ends of the warp drawn through the creel are now passed over the guide roll 74, and are laid over the forward end of the counting-in frame 72, where they are tied in bunches to weights 98 preparatory for the operation of counting in the ends in the dents of the counting-in comb 76. It is the task of the operator next to sort the ends and place them in parallel relationship in groups or sheaths in the dents of the comb 76. The manner in which this operation of counting in the threads is carried on is best shown in Figs. 2 and 4. As shown in Fig. 4, four threads or ends are placed in each dent between two adjacent teeth 100 of the counting-in comb. It will be understood that the number of ends in each sheath may be varied in accordance with the requirements of the particular set, and may vary from one to six or seven as desired. After all of the ends have been sorted and counted in on the counting-in comb 76, so that the threads occupy a parallel relationship and have been placed in even groups of four each in the dents of the comb 76, the operator next places a lease string 102 in the warp to maintain the alignment and division of the ends during the subsequent operation of pulling the warp through the machine, so that they may be readily placed in the corresponding dents of the separating comb 46 at the forward end of the machine. The operation of placing in the lease string 102 is conveniently carried out by means of a leasing tool 104, which, as best shown in Figs. 2 and 4, comprises a U-shaped wire having one end thereof bent upwardly and the other end bent downwardly. The operator inserts this tool into the edge of the warp adjacent the comb 76 following the division indicated by the dents of the counting-in comb 76, so that the ends of each succeeding group or sheath will pass alternatively over and under, and under and over the two arms of the tool 104. After a number of the sheaths have been sorted out by means of this tool, the tool while still engaged within the warp is pushed rearwardly over the guide roll 74, and the lease string 102 then passed around the separated groups or sheaths at a point about midway between the guide roll 74 and the creel. The tool is then withdrawn from the warp, and is again inserted adjacent the comb 76 to pick up the next succeeding sheaths or groups. In this manner the lease string 102 is threaded through the entire warp at a distance as far removed as possible from the leading end of the warp, so that a minimum risk is incurred of disarranging the groups or sheaths during the

subsequent operations of tying the warp ends to the severed ends of the old warp and drawing the new warp through the machine. After the lease string 102 has been fully threaded through the warp, the weights 98 are detached, and the whole warp is then thrown back over a supporting roller 106 carried on a standard 108 on the forward end of the creel ready for use. The operations above described, of drawing the ends through the creel and the counting in of the threads, together with the subsequent leasing of the sheaths by means of the lease string 102, are carried out preferably while the machine is in operation with the alternate creel. Inasmuch as this operation of counting in the ends requires extremely careful and painstaking work, and may take from two to eight hours depending upon the size and complexity of the set, it will readily be seen that a very considerable saving is effected in the time in which it is necessary to keep the slasher idle in introducing a new set into the machine. Further considerable saving is effected in making up the new set on an alternate creel in accordance with applicant's method, owing to the fact that the task of setting up and counting in the ends of the new warp may be performed, in connection with applicant's leasing frame, by unskilled labor, whereas with the old method of setting up, the counting in of the new ends at the forward end of the machine was performed by the operator of the slasher, who is necessarily a high priced man of considerable experience and skill in the operation of these machines.

When the section beams of the creel operating in the machine run out, relatively little time is consumed by the operator in setting up the machine for operation with the alternate creel. First of all the machine is stopped, a certain amount of thread is drawn off from the exhausted creel, and the ends are severed, so that the exhausted creel can be moved on the rails 70 out of operative position. The newly prepared creel is now moved into position behind the machine, the ends are tied in bunches to the severed ends of the finished warp, and the machine is started to draw the new ends through the machine. During this operation the separating comb 46 can be removed or a rod inserted to carry the bunched ends over the top of the comb and around the feed roll 44. The machine is then stopped and the finished warp beam removed and an empty one inserted in its place. The new ends are clamped onto the new beam in the usual manner, and the new ends are laid into the dents of the separating comb 46 in accordance with the arrangement and grouping indicated by the lease string 102. The machine is then turned over slowly while the operator places in the lease rods 96 as indicated by the respective lease strings 88, 90, 92 and 94, so that the machine is ready for operation on the new warp.

It will be noted that the teeth of the separating comb 46 and of the counting-in comb 76 are open at the top, so that the ends may be held under tension at all times during the operations of counting in the threads on the leasing frame and subsequently of positioning the sheaths in the dents of the supporting comb at the forward end of the machine, thus greatly facilitating the work of the operator or operators in handling the threads.

The invention having been described, what is claimed is:—

1. The method of setting up a slasher for operation upon a new warp which comprises drawing the ends from section beams mounted on a creel apart from the machine, counting in the ends on a counting-in frame having a comb for separating the ends in accordance with the requirements of the set to be drawn through the separating comb of the slasher, taking a lease of the separated ends, removing the ends from the counting-in frame, placing the creel in operating position to the rear of the slasher, drawing the new set through the machine, and placing the separated ends as determined by the lease in the separating comb of the slasher.

2. The method of setting up a slasher for operation upon a new warp which comprises drawing the ends from section beams mounted on a creel apart from the machine, counting in the ends on a counting-in frame in sheaths equal in number to the dents to be employed in the separating comb of the slasher to separate the ends in accordance with the requirements of the set to be drawn through the separating comb, taking a lease of the sheaths thus formed, placing the creel in operative position to the rear of the slasher, drawing the new set through the slasher, and placing the sheaths as determined by the lease in the dents of the separating comb.

3. The method of setting up a slasher for operation upon a new warp which comprises drawing the ends from section beams mounted on a creel apart from the machine, counting in the ends in sheaths on a counting-in frame having a comb with dents equal in number to the dents of the slasher separating comb to separate the ends in accordance with the requirements of the set to be drawn through the separating comb, taking a lease of the sheaths formed on the counting-in frame, placing the creel in operative position to the rear of the slasher, drawing the new set through the machine, and placing the sheaths as determined by the lease in the dents of the separating comb.

4. The method of setting up a slasher for operation upon a new warp which comprises drawing the ends from section beams mounted on a creel apart from the machine, counting in the ends on a counting-in frame having a comb to form sheaths equal in number to the dents to be employed in the separating comb of the slasher to separate the ends in accordance with the requirements of the set to be drawn through the separating comb, taking a lease of the sheaths formed on the counting-in frame, placing the creel in operating position to the rear of the slasher, drawing the new set through the machine, and placing the sheaths as determined by the lease in the dents of the separating comb.

5. The method of setting up a slasher for operation upon a new warp which comprises drawing the ends from section beams mounted on a creel apart from the machine, the ends from each beam in turn being passed around and having added thereto the ends of each succeeding beam, taking a lease between the ends of each section beam and the ends of the preceding section beam or beams passing around said beam, counting in the ends on a counting-in frame having a comb to form sheaths equal in number to the dents to be employed in the separating comb of the slasher to separate the ends in accordance with the requirements of the set to be drawn through the separating comb, taking a lease of the sheaths formed on the counting-in frame, placing the creel in operating position to the rear of the slasher, drawing the new set through

the machine, placing the sheaths as determined by the lease in the dents of the separating comb, and placing lease rods through the warp as indicated by the lease of the ends from the separate sections.

6. The method of setting up a slasher for operation upon a new warp which comprises drawing the ends from section beams mounted on a creel apart from the machine, placing the ends over a counting-in frame having a comb with open dents therein, weighting the ends to tension the same, counting in the ends in the dents of the comb in sheaths equal in number to the dents to be employed in the separating comb of the slasher to separate the ends in accordance with the requirements of the set to be drawn through the separating comb, taking a lease of the sheaths formed on the counting-in frame, placing the creel in operating position to the rear of the slasher, drawing the new set through the machine, and placing the sheaths as determined by the lease in the dents of the separating comb.

7. Apparatus for use in setting up a slasher, having a warp beam onto which the warp is wound and a separating comb for guiding the ends in sheaths onto the beam, for operation upon a new set which comprises an alternate creel, and a counting-in frame having supported thereon a counting-in comb with open dents, equal in number to the sheaths to be formed from the warp for separating and leasing the ends in sheaths to be subsequently placed in the separating comb for guiding during the operation of winding the warp on the slasher.

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