March 21, 1933. O. KLEINSCHMIT 1,902,286

METHOD OF AND MECHANISM FOR EXTRACTING INTERCONNECTING THREADS BETWEEN STITCHED BOOKS

Filed April 21, 1932 2 Sheets-Sheet 1

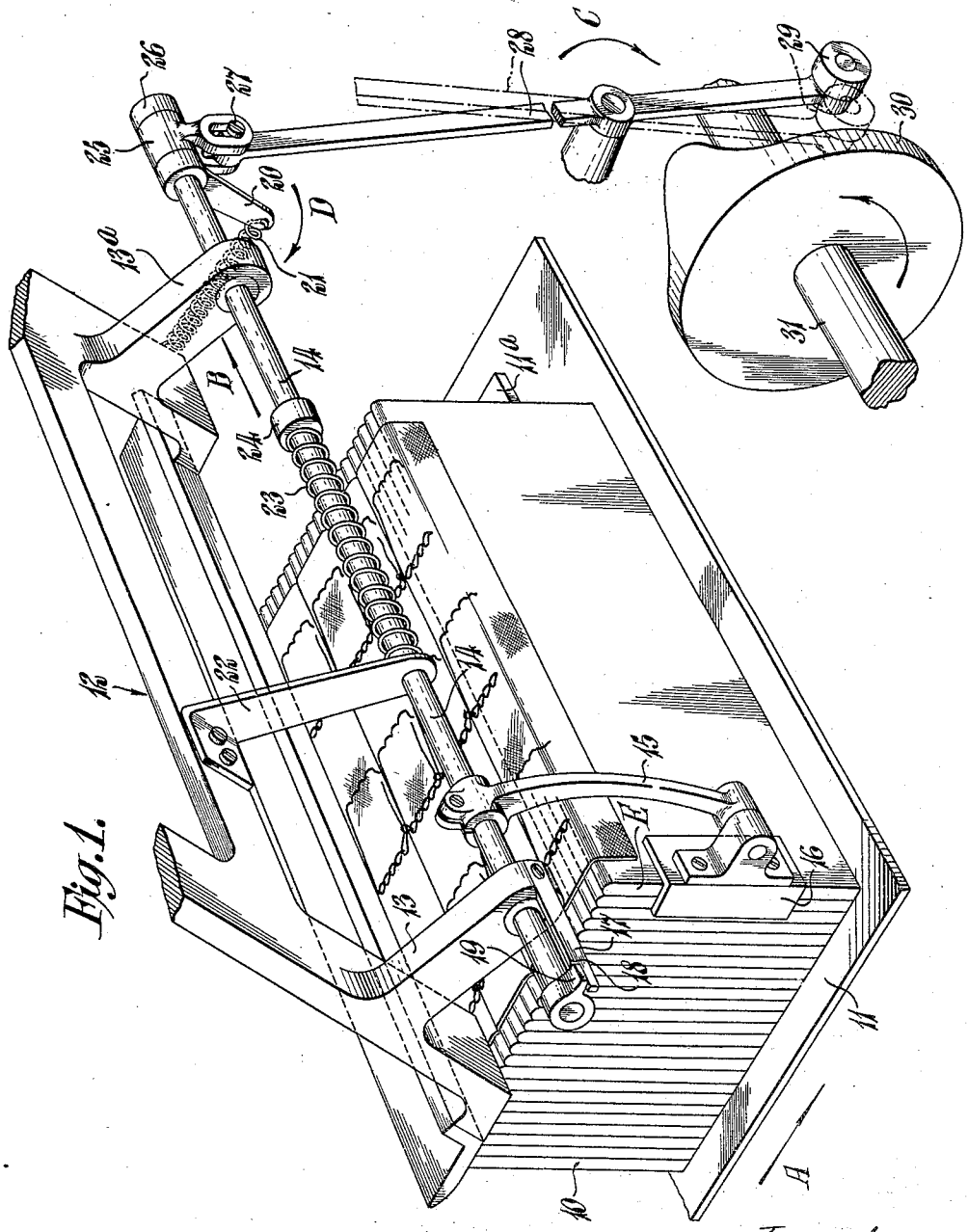


Fig. 1.

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Fig. 2.

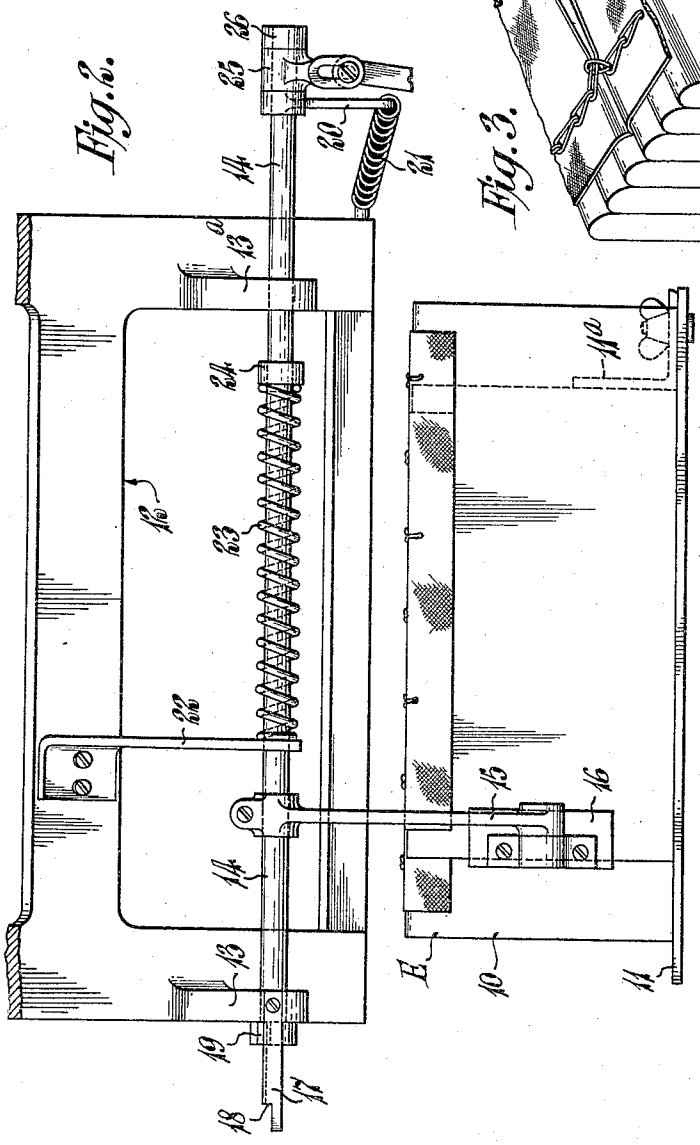
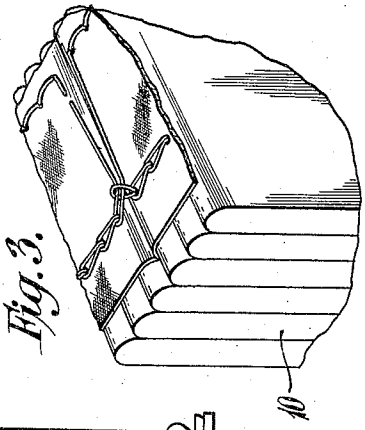


Fig. 3.



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Patented Mar. 21, 1933 1,902,286

UNITED STATES PATENT OFFICE

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METHOD OF AND MECHANISM FOR EXTRACTING INTERCONNECTING THREADS BETWEEN STITCHED BOOKS

Application filed April 21, 1932, Serial No. 606,747, and in Germany June 4, 1931.

The present invention relates to the extraction of the severed interconnecting threads between the books of a continuously stitched book-pad and has for its object to provide means for performing this operation mechanically and, if desired, automatically.

According to this invention the thread extraction is performed by means whereby the foremost stitched book of the book-pad is displaced laterally with relation to the remainder of the book-pad.

The book-pad may be produced in a book-stitching or book-binding machine of any type suitable for this purpose and the manner of stitching the book-pad and the severance of the threads to be extracted forms no part of the present invention. The severance of the threads may be achieved in any desired manner, e. g. mechanically as described in the copending application of Andre Rivlois and Oskar Müller, Serial No. 501,128, dated 9th December 1930.

One constructional embodiment of the present invention will now be described by way of example and with reference to the accompanying drawings in which:

Fig. 1 shows in perspective view the forward end of the book-pad slideway or trough of a book-stitching machine provided with book-displacing or thread extracting mechanism according to this invention and set in the normal position.

Fig. 2 shows an elevational view of the mechanism with the book-displacing mechanism actuated to displace the foremost book of the pad relatively to the remainder of the book-pad, and

Fig. 3 is a detail view drawn to a larger scale showing the disposition of the interconnected threads when they are severed and hang in adjacent stitch loops.

The continuously stitched book-pad 10 is progressed in the usual manner during the stitching thereof along the floor 11 of the slideway or trough of a book-stitching machine so that assuming that the signature feeding and book-stitching mechanism to be positioned to the left or rear of the book-pad 10 as viewed in the drawing, the said book-pad travels in the direction of the arrow A. A side lay or fence 11*a* is adjustably mounted on the floor 11 to the righthand side thereof.

An auxiliary frame 12 provided with bearing brackets 13, 13*a* and attached to the main frame of the machine or forming part thereof extends above the forward end of the book-pad trough transversely thereof as shown in the drawings.

A shaft 14 also extending transversely of the book-pad trough is slidably and rotatably journalled in the bearing brackets 13, 13*a*. The shaft 14 has rigidly mounted thereon, a downwardly extending arm 15 which is preferably curved and carries a clamp or angle bracket 16 adapted to engage the outermost corner of the edge E of the foremost book of the book-pad. The arm 15 is adjustably mounted on the shaft 14 by means of a flanged, split boss and clamping screw, while the clamp or bracket 16 is pivotally secured to the lower extremity of the said arm.

The bearing bracket 13 has secured thereto a substantially horizontal outwardly extending finger or abutment 17 which is provided at its free outer extremity with an angular recess 18 adapted to receive the nose of a retaining lug 19 which is rigidly mounted upon the corresponding extremity of the shaft 14.

A downwardly extending arm 20 keyed to the shaft 14 adjacent the further extremity thereof has secured thereto a helical tension spring 21 which is anchored to the frame 12. The shaft 14 is thus urged to rotate about its longitudinal axis in the direction of the arrow D, Fig. 1, so that normally the nose of the lug 19 engages the horizontal, bearing surface of the recess 18 in the abutment 17, Fig. 1, and the clamp bracket 16 held by the arm 15 is positioned substantially vertical ready to receive the corner of the advancing book-pad.

A bent strip forming a further bracket 22 is secured to the frame 12 and extends therefrom to embrace the shaft 14 intermediate the length of the latter.

The bracket 22 forms a buffer or abutment for a helical compression spring 23 which embraces the shaft 14 and is compressed between the abutment 22 and a collar 24 mounted upon the shaft and pinned thereto. The

spring 23 tends to displace the shaft 14 longitudinally in the direction of the arrow B, i. e., transversely of the book-pad and thus impart a limited lateral movement to the clamp or bracket 16.

This longitudinal movement of the shaft 14 and lateral movement of the clamp or bracket 16 normally is prevented by the position of the lug 19 which abuts the vertical bearing face of the recess 18 formed in the finger or abutment 17.

A sleeve 25 loosely mounted on the shaft 14 and held between the boss of the lever 20 and a pinned collar 26 is provided with a downwardly extending bifurcated lug which is slotted to receive a pivot bolt 27. The bifurcated lug is adapted to receive the upper extremity of a substantially vertical pivoted connecting rod 28 the connection therebetween being made in the form of a knuckle joint the pivotal bolt 27 of which is given sufficient clearance in its bearing slots to accommodate the arcuate path of movement of the upper extremity of the said connecting rod.

The lower extremity of the connecting rod 28 carries a cam follower roller 29 which, when the connecting rod 28 is rocked about its pivot in the direction of the arrow C, engages the cam face of a rotatable actuating disc 30 mounted upon a drive shaft 31. The latter is journalled in the main frame of the machine and placed in driving connection with the machine drive (not shown).

The operation of this device is as follows:

The forwardly moving book-pad 10 which is moved in known manner by the stitching operations advances in the direction of the arrow A and the outermost corner of the edge E of the foremost book engages the clamp or bracket 16. The interconnecting threads between the foremost books have at this stage of the operation been severed in any desired manner and the severed threads as is usual hang in the loops of the adjacent stitches as shown in Fig. 3. During the continued stitching of the book-pad the latter continues to advance thus also moving forward the bracket 16. By this movement of the bracket 16 the shaft 14 is rotated about its longitudinal axis against the force of the spring 21 and the nose of the lug 19 lifts clear of the recess 18 in the abutment 17.

Under the impulse of the compressing spring 23 the shaft 14 is displaced longitudinally and so moves the arm 15 so that the clamp 16 and the foremost book held thereby are displaced laterally in relation to the remainder of the book-pad as shown in Fig. 2. The remainder of the book-pad is held from lateral displacement by the side lay or fence 11*a*.

By this lateral movement the severed threads of the terminal stitches of the adjacent books or the idle stitches interposed therebetween are withdrawn from the loops in which they depend. The books are thus finally freed from the book-pad and may be manually removed and stacked or fed to mechanical stacking and/or collecting means not shown.

At the completion of the displacing movement of the shaft 14 the cam follower 29 carried upon the lower extremity of the connecting rod 28, which latter has been rocked about its pivot during the displacing movement of the shaft 14, engages the cam surface of the disc 30 (as shown in chain-dotted lines in Fig. 1). The disc 30, constantly revolved by the shaft 31, rocks the connecting rod 28 to its normal position as shown in full lines in Fig. 1.

In this movement of the connecting rod 28 the shaft 14 is moved to the left to its normal position against the force of the spring 23, and the nose of the lug 19 registers with the recess 18 in the abutment 17 whereupon the spring 21 acts to rotate the shaft 14 against its longitudinal axis and so lock the said shaft against displacing movement by encountering the nose 19 with the vertical face of the recess 18.

The mechanism is thus set in the normal position of rest until engaged by the advancing book-pad.

The above described embodiment of the invention has been set forth merely by way of example and it is not desired to limit thereto the scope of the invention which is defined in the appended claims.

What I claim is:—

1. Means for extracting mechanically the severed interconnected threads between adjacent books of a continuously stitched book-pad, comprising a book-engaging device adapted to engage the foremost book of the book-pad, and means for displacing said device and the book engaged thereby laterally with relation to the remainder of the book-pad.

2. Means for extracting mechanically the severed interconnected threads between adjacent books of a continuously stitched book-pad, comprising a book-engaging device, means for contacting said device with a section of the book-pad, and means for displacing said device and the book-pad section engaged thereby laterally with relation to the remainder of the book-pad.

3. Means for extracting mechanically the several interconnected threads between adjacent books of a continuously stitched book-pad, comprising a book-engaging device adapted to engage a corner of the foremost book of the book-pad, and means for displacing said device and the book engaged thereby laterally with relation to the remainder of the book-pad.

4. Means for extracting mechanically the severed interconnected threads between adja-

cent books of a continuously stitched book-pad, comprising a book-engaging device, means for engaging said device with a section of a moving book-pad, means for displacing said device and said book-pad section engaged thereby laterally with relation to the remainder of said book-pad, and means for controlling the displacement of said device in accordance with the movement of the said book-pad.

5. Means for extracting mechanically the severed interconnected threads between adjacent books of a continuously stitched book-pad, comprising a book-engaging device, means for engaging said device with a section of a moving book-pad, means for allowing a limited displacement of said device in the direction of movement of said book-pad, means for displacing said device and the book-pad section engaged thereby transversely to the direction of travel of the remainder of the book-pad and means for utilizing the first mentioned displacement of the device to control the transverse movement thereof.

6. Means for extracting mechanically the severed interconnected threads between adjacent books of a continuously stitched book-pad, comprising a book-engaging device, means for engaging said device with a section of a moving book-pad, means for displacing said device and said book-pad section engaged thereby laterally with relation to the remainder of said book-pad, means for controlling the displacement of said device in accordance with the movement of the said book-pad, and means for resetting the laterally displaced device in the initial position.

7. Means for extracting mechanically the severed interconnected threads between adjacent books of a continuously stitched book-pad, comprising a book-engaging device, means for engaging said device with a section of a moving book-pad, means for allowing a limited displacement of said device in the direction of movement of said book-pad, means for displacing said device and the book-pad section engaged thereby transversely to the direction of travel of the remainder of the book-pad, means for utilizing the first mentioned displacement of the device to control the transverse movement thereof and means for resetting the laterally displaced device in the initial position.

8. In a book-stitching machine, a book-pad slideway adapted to support a moving book-pad having the interconnecting threads of its adjacent books severed, a supporting member positioned above said slideway and extending transversely of said trough and moving book-pad, a pusher member supported by said supporting member, means for engaging said pusher member with a section of the book-pad, means for displacing said pusher member and book-pad section engaged thereby transversely of the remainder of the book-pad, means for controlling the displacement of said device by the movement of the book-pad, and means for resetting said displaced device in its initial position.

9. In a book-stitching machine, a book-pad slideway adapted to support a moving book-pad, means for supporting a shaft above said slideway and extending transversely thereof, a shaft slidably mounted in said shaft-supporting means, a pusher member depending from said shaft, means for engaging said pusher member with a section of the moving book-pad, means for displacing said pusher member and book-pad section engaged thereby laterally with relation to the remainder of the book-pad, and means for resetting said pusher member in its initial operative position.

10. In a book-stitching machine, a book-pad slideway adapted to support a moving book-pad, means for supporting a shaft above said slideway and extending transversely thereof, a shaft slidably mounted in said shaft-supporting means, a pusher member secured to said shaft, means for engaging said pusher member with a section of said book-pad, means for displacing said pusher member and book-pad section engaged thereby transversely of the remainder of said book-pad, means for timing the displacement of said pusher member, and means for resetting said pusher member in its initial operative position.

11. In a book-stitching machine, a book-pad slideway adapted to support a moving book-pad, means for supporting a shaft above said slideway, a shaft slidably mounted in said supporting means and extending transversely of said slideway and book-pad carried thereon, a pusher member adjustably secured to said shaft, means for engaging said pusher member with a section of said book-pad, means for displacing said pusher member and book-section engaged thereby laterally with relation to the remainder of the book-pad, means associated with said shaft for timing the displacing movement of said pusher member, and means for resetting said pusher member in its initial operative position.

12. In a book-stitching machine, a book-pad slideway adapted to support a moving book-pad, means for supporting a shaft above said slideway, a shaft slidably mounted in said supporting means and extending transversely of said slideway and book-pad carried thereon, a downwardly extending arm adjustably secured to said shaft, a pusher member pivotally mounted at the lower extremity of said arm and positioned to engage a section of the moving book-pad, means for holding said pusher member in engagement with said book-pad section, means for displacing said pusher member and book-pad section engaged thereby laterally with

relation to the remainder of said book-pad, and means for resetting said pusher in its initial operative position.

13. In a book-stitching machine, a book-pad slideway adapted to support a moving book-pad, means for supporting a shaft above said slideway, a shaft slidably mounted in said shaft-supporting means and extending transversely of said slideway and book-pad carried thereon, a pusher member adjustably secured to said shaft, means for engaging said pusher member with a section of said moving book-pad, a helical compression spring carried by said shaft and adapted to displace said shaft and pusher member secured thereto laterally with relation to the remainder of the book-pad, and means for resetting said pusher member in its initial operative position.

14. In a book-stitching machine, a book-pad slideway adapted to support a moving book-pad, means for supporting a shaft above said slideway, a shaft rotatably and slidably mounted in said shaft supporting means, means for displacing said shaft transversely of the moving book-pad, a stationary abutment, a finger carried by said shaft and adapted normally to engage said abutment and hold said shaft against displacement, a pusher member secured to said shaft and positioned to engage a section of the moving book-pad and be carried forward therewith, so that said shaft is rotated about its axis to disengage said lug from said abutment thus permitting the lateral displacement of said shaft and said pusher member carried thereby, and means for resetting said shaft and said pusher member in the initial operative position.

15. In a book-stitching machine, a book-pad slideway adapted to support a moving book-pad, means for supporting a shaft above said slideway, a shaft slidably mounted in said supporting means and extending transversely of said slideway and book-pad carried thereon, a pusher member secured to said shaft, means for engaging said pusher member with a section of said book-pad, means for displacing said shaft and pusher member carried thereby transversely of said book-pad, means for automatically timing the displacement of said shaft and pusher member, and means for resetting said shaft in its initial operative position comprising a pivotal lever, means for linking said lever to said shaft and means for mechanically rocking said lever about its pivot to reset said shaft.

16. In a book-stitching machine, in combination, a book-pad slidway adapted to support a moving book-pad, a side guide provided on said slideway, a shaft supporting member extending above and transversely of said slideway, a shaft rotatably and slidably mounted in said shaft supporting member, a downwardly extending arm adjustably secured to said shaft, an angle clamp pivotally mounted upon the lower extremity of said arm and positioned to engage a corner of the foremost book of the book-pad, a collar pinned to said shaft intermediate its length, a shoulder bracket secured to said shaft-supporting means and embracing said shaft, a helical compression spring embracing said shaft and confined between said collar and said bracket to impart displacing movement to said shaft and said clamp carried thereby, a stationary abutment adjacent said shaft, a lug carried by said shaft and adapted normally to engage said abutment and thus withhold said shaft from displacement and undesired rotation, means for holding said clamp in engagement with the foremost book of said moving book-pad so that the said clamp is carried along a limited distance with said book-pad thus rotating said shaft and disengaging said lug from said abutment, a pivotal lever linked to said shaft, a cam follower carried by said lever, and a rotating cam disc adapted to engage said cam follower when said shaft is displaced so that rocking movement is imparted to said lever thus resetting said shaft and said clamp in the initial operative position.

In testimony whereof I affix my signature.

OSCAR KLEINSCHMIT.