Feb. 24, 1953 F. F. LARSON 2,629,408

TEMPLE THREAD CUTTER FOR LOOMS

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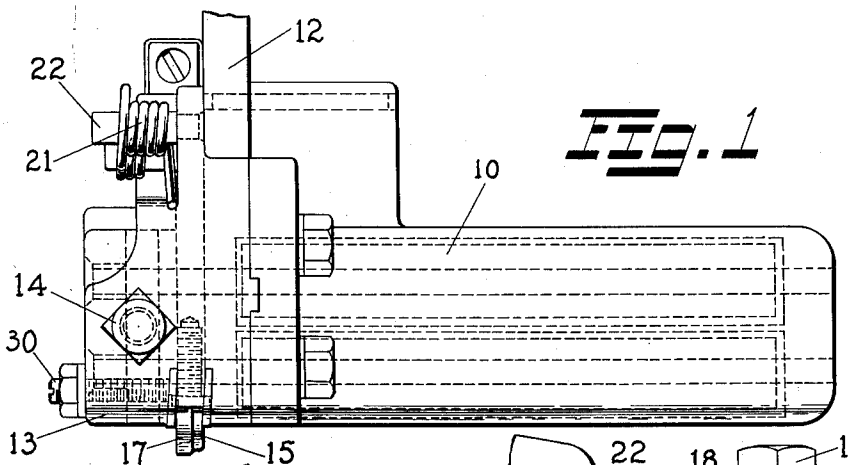

Fig. 1

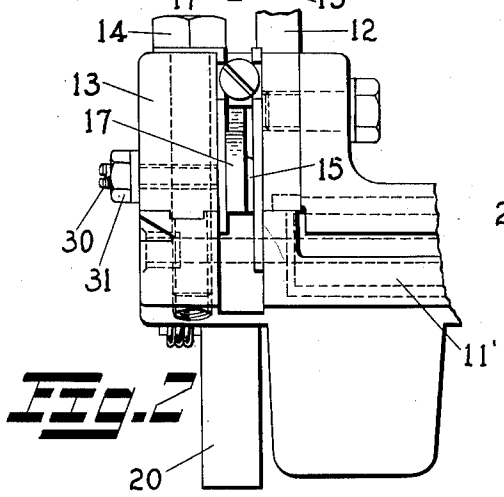

Fig. 2

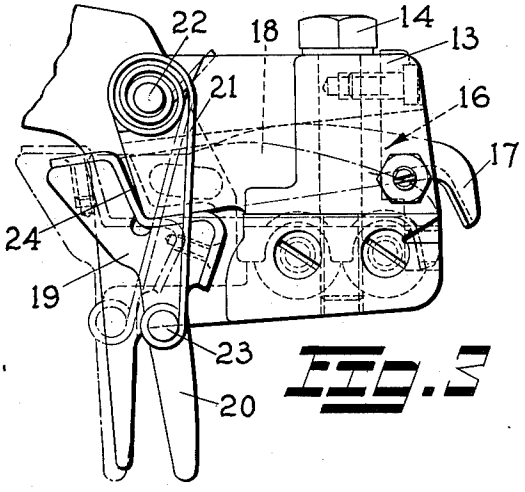

Fig. 3

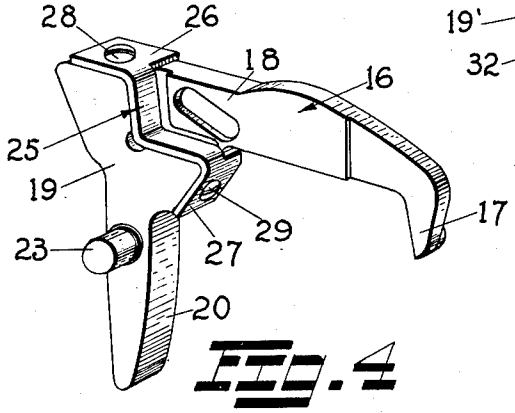

Fig. 4

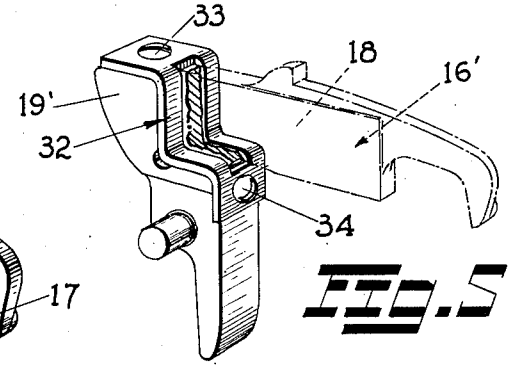

Fig. 5

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TEMPLE THREAD CUTTER FOR LOOMS

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This invention pertains to improvements in temple thread cutters for looms.

It is a general object of the invention to improve the operation of temple thread cutters and to render them more effective in their action and longer lived in that the smoothness of operation, quietness with which the mechanism functions and the life of the parts are greatly improved.

It is a more specific object of the invention to modify a temple thread cutter of the type hereinafter described to eliminate wear of certain of the parts which has heretofore necessitated replacement thereof or resort to other rather difficult or relatively expensive practices in order to alleviate the effects of such wear.

It is a further more specific object of the invention to render the functioning of such thread cutters more quiet and to provide for smoother operation of the cutter thereby increasing its general efficiency.

Temple thread cutters are employed on most all looms and are of a general type as illustrated in U. S. Patent 2,163,308, said cutters being caused to function once at each beat-up movement of the lay, although there is no actual thread to be cut except at relatively infrequent intervals as determined by the length of time for which one individual filling package serves before it becomes exhausted and transfer to another package takes place. These cutters are mounted on one of the temples, more specifically, that temple adjacent the side at which replenishment of the filling occurs and are more or less a part of the temple. The cutters which are rather simple in construction comprise a fixed blade attached to part of the temple structure and a movable blade which is guided within a portion of the temple structure, this blade being urged to a non-cutting or inactive position by a spring and being adapted to be rocked so that its tip cutting portion engages a thread if one happens to be within the range of the cutter, and thereafter moves downwardly and forwardly to cut that thread as close to the selvage of the fabric as is practicable.

Since the movable cutter blade is caused to go through its cutting movement once at each beat-up movement of the lay, or once for each pick even though there is no thread to be cut, there is the possibility of considerable wear of the parts since no lubrication is possible, or at least, lubrication is not feasible in most instances due to the fact the cutter functions in proximity to the edge of the fabric. Wear may be taken up to some extent by an adjustment provided in these mechanisms so that the cutting

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function itself may continue as planned, but there is a very definite rocking and sliding movement of the parts which tends to abrade certain of the wearing surfaces and then as the blade returns to its inactive position under the influence of the fairly strong controlling spring, the shock or impact of the abutting or stopping surfaces causes further abrasion so that the parts become unduly worn after a period of operation. It has been the practice to replace the movable cutter member at intervals, and in some instances, different schemes have been devised for taking account of the wear at the cooperating surfaces on the relatively fixed part of the mechanism which really forms a part of the temple structure and is too expensive to be replaced. One solution of this problem has been that of hardening the parts, but that is relatively difficult since the entire structure should not be hardened and local hardening involves additional operations and expense which are better dispensed with. The parts are also of cast iron and hardening locally involves difficulties and gives rise to some effects which are not to be tolerated in accordance with better practice.

In accordance with the invention the action of the cutter is greatly improved and the wear of the parts virtually eliminated by the introduction of a wearing pad of non-metallic material, this pad being of a particular shape and readily attached or detached from the cutter member which is, of course, easily removed from the remainder of the mechanism so that the replacement of one of these impact and wear absorbing pads involves very little time and relatively negligible expense. The cutter itself functions more smoothly, the noise incidental to its operation is to a great extent eliminated and the cutting function and adjustment of the movable blade continues as originally set for a much longer period of time, not being affected by the continuous pounding or impact of the parts incidental to operation thereof.

The invention is hereinafter described in greater detail by reference to one particular embodiment thereof and a modification as illustrated in the accompanying figures of drawing wherein:

Fig. 1 is a plan view of a temple to which the invention may be applied.

Fig. 2 is an elevational view thereof as seen from the cutting end of the mechanism.

Fig. 3 is a side elevation showing the cutter in its two opposed positions.

Fig. 4 is a perspective view showing the invention as applied to one cutter blade and

Fig. 5 is a similar perspective view showing the

invention according to a certain modification thereof adapted to function with a different type of cutter blade.

Now referring to Figs. 1, 2 and 3, the temple thread cutter itself is mounted as a functionally integral part of a temple which comprises a casing member having a top portion 10, a lower casing part 11 which is preferably cast integrally with a bar 12 by means of which the entire temple is supported to slide in a conventional guide member all as illustrated in the U. S. Patent 2,163,308, above mentioned. The thread cutter itself includes what will herein be termed a cutter support 13 and which is, in effect, merely a continuation of the casing and bar heretofore mentioned being attached thereto by a screw 14 passing downwardly through the said support and being threaded into an extending end of the bar and lower casing member 11, the alignment of these parts being maintained by a tongue and groove or in any other satisfactory manner as is well understood by those conversant with this art. The cutting members themselves include a fixed or ledger blade 15 permanently attached to the side of bar 12 at its forward or foremost end and a movable cutter blade generally indicated by numeral 16 and having a downwardly hooked cutter tip 17, and at the opposite end of the finger portion 18 of the movable blade, a widened part hereinafter termed an abutment 19 and a downwardly extending actuating heel 20. As more clearly illustrated in Figs. 4 and 5 which are in perspective, these parts are adapted to slide and to rock throughout a limited angular extent, a spring 21 of particular form being coiled about a pin 22 on the support and at its opposite end being attached to a second pin 23 on the heel 20 for effecting a return movement and for maintaining the cutter in the full line position, Fig. 3.

As may be seen in Figs. 3, 4 and 5, the abutment 19 of the movable blade is stepped or angularly formed so as to provide a surface for abutting against a similarly stepped portion 24 of the bar and lower casing member this part of the bar termed the stopping surface and as may be noted, being less obtusely formed than is the stepped part of the abutment 19. Normally there is a metal-to-metal contact at these surfaces in all cutters heretofore employed and the action of the parts is such that upon contact of an abutment or some intended part of the lay with the heel 20, the cutter is first rocked so that the cutting portion 17 of the blade moves downwardly engaging a thread if one is in range, and thereafter further movement of the part causes the entire movable blade to be displaced forwardly of the loom or to the dot-and-dash line position of Fig. 3. It is obvious that the movement of the parts in rocking and in sliding from one position to the other involves a wearing of the complementary engaging surfaces and also, upon retraction of the lay, the opposite movement as induced by spring 21 not only gives rise to corresponding tendency to wear but also results in a very definite impact between the abutting and stopping surfaces which is in the nature of a pounding action. This cycle is repeated in the neighborhood of two hundred or more times a minute in many looms and therefore, relatively rapid wearing of the parts takes place since, as before stated, no lubrication may normally be applied.

In accordance with the invention a combined wearing and shock or impact absorbing pad generally designated by numeral 25 is attached to the stepped surfaces of the abutment 19 of movable cutter blade 16 and this pad is formed in a particular manner so as to be held very rigidly in position, yet may be easily attached or detached incidental to replacement when and if that becomes necessary. The pad itself is notched or cut away so as to span the finger portion 18 of the movable cutter member and, while it is relatively narrow at the stepped abutting surfaces which rock and have impact against the stopping surfaces 24, it is rather wide at the horizontal attaching portion 26 and at the obliquely disposed attaching portion 27 at the lower part of the abutment. Screws or other attaching means, preferably of some threaded nature such as screws 28 and 29, serve to retain the pad in position and, of course, replacement merely involves disconnecting the spring 21 from the pin 23, pulling the movable cutter member outwardly of the support and removing the screws 28 and 29 whereupon a new pad may be attached and the parts reassembled in a matter of a very short period of time. This makes it very easy to maintain these cutter mechanisms in relatively good condition and obviates the difficulties heretofore experienced and the relatively large amount of expense involved in replacing the parts, especially the bar or those parts of the guiding structure which are relatively expensive and in which other parts are operatively retained such, for example, as the pin 22 for the spring, the fixed or ledger blade 15 and an adjusting screw 30 and its lock nut 31 by means of which the cutting adjustment itself is originally set and by means of which it may be maintained, although with the present improvement, the need for adjustment thereof is limited to relatively infrequent periods.

The material from which the pad 25 is made is within limits critical and falls into the general classification of resinous compounds. While it is conceivable that various natural materials such as rubber or rubber compounds and leather and the like may be used, it has been found that they do not serve well enough to be practically adapted to use in this connection. The resinous compounds which have been found to have the desirable properties include various molded plastics such as nylon, and molded, fabric filled plastics wherein the fabric filling need not be of a nature to constitute a laminate, although the fabric is bonded together by the molded resinous or other plastic binder. More preferably, the best materials comprise the various resin bonded laminates one example of such being known as "Panelyte." These materials are characterized by resilience, resistance to wear and are smooth surfaced to present a low coefficient of friction.

Now referring to Fig. 5, a modification of the invention involves a slotted pad 32 being apertured along its central portion so as to span or extend to either side of the finger portion 18' of this modified type of cutter blade 16' in which the abutment 19' extends laterally to either side of the finger. Otherwise the general construction is the same and the function is similar except that the amount of surface available for the rocking, sliding and impact absorption of the parts is virtually double that provided in the form of the invention at Fig. 4. Here the pad 32 is maintained in position by screws 33 and 34 as in the first form of the invention, the main difference being one incidental to the particular shape of the abutment involved in which

the surfaces to which the pad is attached are horizontal in one instance but more or less vertically disposed in the other.

The materials from which the pads **25** or **32** may be formed have been discussed and in some instances these materials are to be molded to shape, while in others they are to be formed by heating the material which is preferably of a thermoplastic type in that instance. Some of the resin bonded laminates are commercially available in strip form and may be cut or punched out after which they are heated and brought to the proper form, that in certain instances being done incidental to the productive of the material itself or perhaps later where the material has originally been formed in strips produced for general usage.

In actual operation the functioning of the cutter blade when the pad herein described is employed is first characterized by rocking movement of the pad surface about the point of the stepped stopping surface **24** of the relatively fixed part of the mechanism whereafter the continued movement to the dot-and-dash line position, Fig. 3, involves a sliding of the more or less horizontal portion of the stepped pad along the corresponding complementary surface of the relatively fixed part of the temple or cutter supporting mechanism forming a part thereof. The return movement of the parts involves both sliding and rocking and also an impact between the more or less vertically disposed portions of the stepped pad and the surface **24** since the spring **21** effects this return movement as the lay moves rearwardly after effecting beat-up of the last pick. In all of these instances the presence of the pad formed of the material as described permits a much easier movement of the parts since this material has a much better tendency to slide over the cooperating metal surfaces involved than have the two cast iron surfaces heretofore employed. The impact of the parts does not give rise to the pounding of the metal thereby abrading the surfaces and the noise heretofore normally accompanying the actuation of the cutter is virtually eliminated.

In the event the pads become worn to an extent or in any other manner unfit for further service, their replacement is a very simple matter and may be effected at a cost which is comparatively negligible.

In the claims following, the terminology with respect to the material from which the wear resistant pads are formed, notably a "resinous compound" is intended to cover all types of resinous bonded laminates, molded plastics, either fabric filled or without a filler as above described and the invention and claims are not to be limited in that respect except as is necessary by the prior art or by express limitations therein.

While one embodiment and a modification of the invention have been disclosed, it is to be understood that the inventive concept may be carried out in a number of ways. The invention is, therefore, not to be limited to the precise details described, but is intended to embrace all variations and modifications thereof falling within the spirit of the invention and the scope of the claims.

I claim:

1. In a temple thread cutter for looms, the combination with a temple including a casing part of which forms a cutter support, a fixed blade and a movable blade which comprises a horizontally disposed finger, a cutter tip at one end thereof

and an abutment from which depends an actuating heel, said support defining a guideway for said movable blade and a complementary stopping surface for said abutment to limit movement of the movable cutter blade in one direction and to form a pivot about which it rotates to cause the tip of the blade to catch a thread to be cut and resilient means biasing the cutter toward open position, of a means to prevent wear on the metallic parts and to dampen the effect of the shock incidental to contact and rocking action between the said abutment and complementary stopping surface which comprises an intermediate impact and wear resistant pad of deformable, resilient, resinous compound so shaped as to span the cutter finger and to cover substantially the entire surface of one of the interengaging surfaces between the movable blade and support therefor, and means for detachably retaining said pad in position.

2. In a temple thread cutter for looms, the combination with a temple including a casing part of which forms a cutter support, a fixed blade and a movable blade which comprises a horizontally disposed finger, a cutter tip at one end thereof and an abutment from which depends an actuating heel, said support defining a guideway for said movable blade and a complementary stopping surface for said abutment to limit movement of the movable cutter blade in one direction and to form a pivot about which it rotates to cause the tip of the blade to catch a thread to be cut and resilient means biasing the cutter toward open position, of a means to prevent wear on the metallic parts and to dampen the effect of the shock incidental to contact and rocking action between the said abutment and complementary stopping surface which comprises an intermediate impact and wear resistant pad of a laminated, resinous, plastic material so shaped as to span the cutter finger and to cover substantially the entire surface of one of the interengaging surfaces between the movable blade and support therefor, and means for detachably retaining said pad in position.

3. In a temple thread cutter for looms, the combination with a temple including a casing part of which forms a cutter support, a fixed blade and a movable blade which comprises a horizontally disposed finger, a cutter tip at one end thereof and an abutment from which depends an actuating heel, said support defining a guideway for said movable blade and a complementary stopping surface for said abutment to limit movement of the movable cutter blade in one direction and to form a pivot about which it rotates to cause the tip of the blade to catch a thread to be cut and resilient means biasing the cutter toward open position, of a means to prevent wear on the metallic parts and to dampen the effect of the shock incidental to contact and rocking action between the said abutment and complementary stopping surface which comprises an intermediate impact and wear resistant pad of a molded, fabric filled, resin bonded plastic material so shaped as to span the cutter finger and to cover substantially the entire surface of one of the interengaging surfaces between the movable blade and support therefor, and means for detachably retaining said pad in position.

4. In a temple thread cutter for looms, the combination with a temple including a casing part of which forms a cutter support, a fixed blade and a movable blade which comprises a horizontally disposed finger, a cutter tip at one

end thereof and an abutment from which depends an actuating heel, said support defining a guideway for said movable blade and a complementary stopping surface for said abutment to limit movement of the movable cutter blade in one direction and to form a pivot about which it rotates to cause the tip of the blade to catch a thread to be cut and resilient means biasing the cutter toward open position, of a means to prevent wear on the metallic parts and to dampen the effect of the shock incidental to contact and rocking action between the said abutment and complementary stopping surface which comprises an intermediate impact and wear resistant pad of a laminated, resinous plastic material so shaped as to span the cutter finger and to cover substantially the entire surface of said abutment, and means for detachably retaining said pad thereon.

5. In a temple thread cutter for looms, the combination wtih a temple including a casing part of which forms a cutter support, a fixed blade and a movable blade which comprises a horizontally disposed finger, a cutter tip at one end thereof and an abutment from which depends an actuating heel, said support defining a guideway for said movable blade and a complementary stopping surface for said abutment to limit movement of the movable cutter blade in one direction and to form a pivot about which it rotates to cause the tip of the blade to catch a thread to be cut and resilient means biasing the cutter toward open position, of a means to prevent wear on the metallic parts and to dampen the effect of the shock incidental to contact and rocking action between the said abutment and complementary stopping surface which comprises an intermediate impact and wear resistant pad of a laminated, resinous, plastic material so shaped as to extend above and below said finger and to cover substantially the entire surface of said abutment, openings adjacent the ends of the pad and threaded means by which it is attached to the movable cutter blade.

6. In a temple thread cutter for looms, the combination with a temple including a casing part of which forms a cutter support, a fixed blade and a movable blade which comprises a horizontally disposed finger, a cutter tip at one end thereof and an abutment from which depends an actuating heel, said support defining a guideway for said movable blade and a complementary stopping surface for said abutment to limit movement of the movable cutter blade in one direction and to form a pivot about which it rotates to cause the tip of the blade to catch a thread to be cut and resilient means biasing the cutter toward open position, of a means to prevent wear on the metallic parts and to dampen the effect of the shock incidental to contact and rocking action between the said abutment and complementary stopping surface which comprises an intermediate impact and wear resistant pad of a laminated, resinous, plastic material slotted to encompass the cutter finger and extending horizontally above and obliquely below said cutter finger, openings adjacent the ends of the pad and threaded means by which it is attached to the movable cutter blade.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
990,505	Stimpson	Apr. 25, 1911
1,049,458	Cunnieff	Jan. 7, 1913
1,233,128	Roy	July 10, 1917
2,061,846	Noyes	Nov. 24, 1936
2,226,279	Bahan	Dec. 24, 1940