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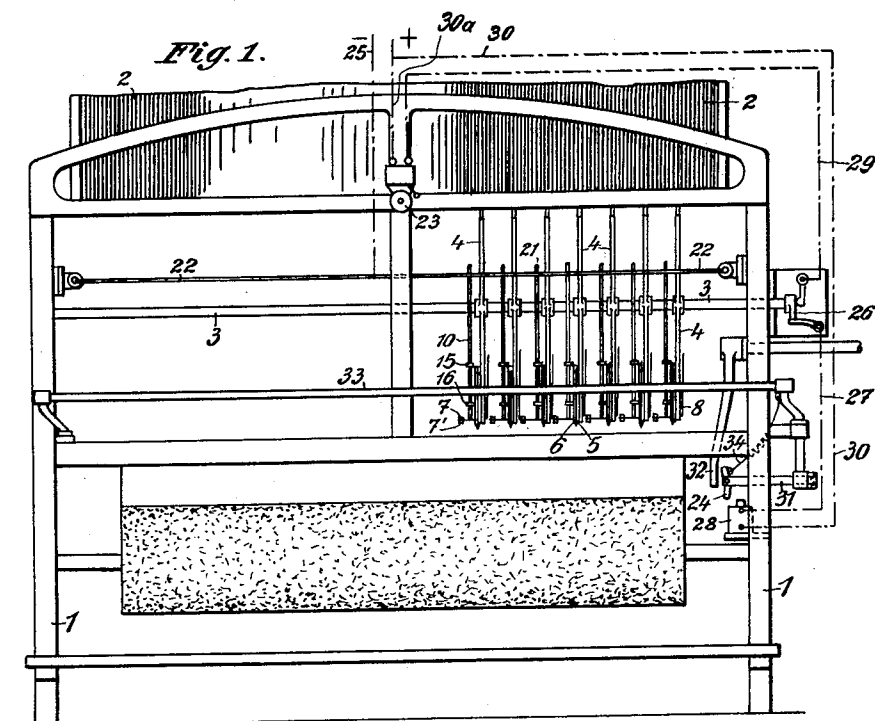
F. BREITSCHÄDEL

1,956,486

STOP MECHANISM FOR LOOMS

Filed Nov. 11, 1929

2 Sheets-Sheet 1



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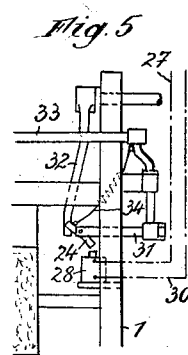
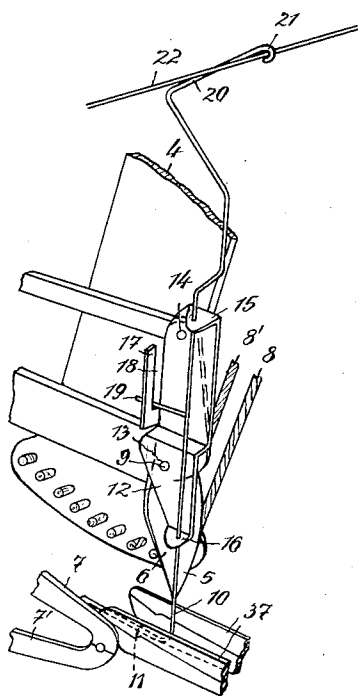
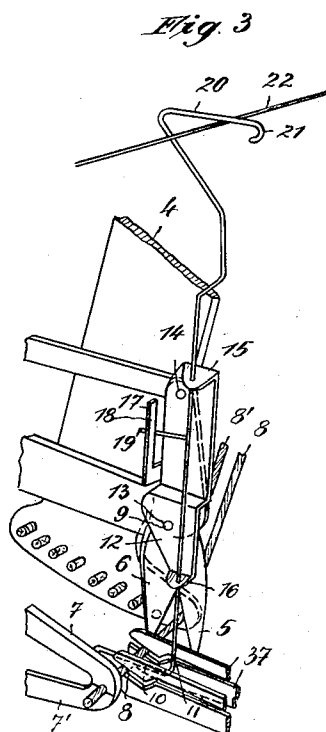
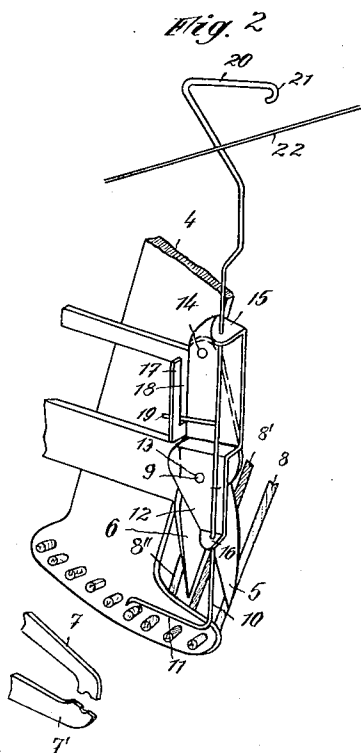
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

1,956,486

STOP MECHANISM FOR LOOMS

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Application November 11, 1929, Serial No. 406,473
In Germany August 19, 1929

9 Claims. (Cl. 139—336)

This invention relates to looms as for weaving and tying carpets and the like, in particular to improvements such as will reduce defects in the work generally caused when by accident a number of tufts, that is, the number of stitches or naps are dropped by the machine.

The well-known Jacquard loom has an array of weaving units or mechanisms, each of which takes care of its carpet zone and includes a thread-holder or so-called color setter to carry a number of differently colored threads or tuft yarns to be drawn out in the direction of weft by certain gripping members for the purpose of forming the pile of the carpet.

Trouble for instance has arisen when due to an enlargement or thickening in the run of the thread, or for any other reason, the thread would not pass through the color setter or would break, so that the members engaged in the further operation of the thread would run idle for a number of tufts in succession, causing more or less large defects in the work. Experience has shown that the number of tufts thus dropped are considerable, that these defects cannot be noticed until the work has been removed from the loom, that even after the removal it requires considerable attention, due to the large area, to discover the damage, and finally that all this in addition to the manual labor required to restore the defects, is apt to appreciably increase the costs, while moreover it is not always possible to remedy the defects by hand in a desirable manner.

The invention reduces the number of dropped tufts to a minimum by means of a guard device or relay mechanism effective to stop the loom automatically whenever a thread fails, and to draw the operator's attention immediately to the source of trouble.

To this end a movable feeler or contact member communicates with the advancing portion of the thread. As soon as this working portion of the thread fails, that is to say, when a tuft or a series of tufts are about to be omitted, the feeler will cause an electric contact to stop the machine, while a preferred alarm or signal may enable the operator to immediately locate the source of trouble.

Features are found in the special arrangement of the novel guard device in combination with a preferred Jacquard loom.

A novel guard device is designed to take care of this function.

The invention is shown in one example of construction for a carpet tying loom in the accompanying drawings wherein:

Fig. 1 shows a diagrammatic illustration of the tying loom in front elevation, the tying members extending over the whole width of the loom being only partly shown.

Fig. 2 shows a perspective view of the guard device in position during the normal operation of the loom, whilst

Fig. 3 shows a perspective view of the guard device in lowered position during normal operation of the loom.

Fig. 4 shows a perspective view of the guard device on the occurrence of a disturbance caused by the omission of the pile thread to be advanced.

Fig. 5 shows the device for disengaging the loom in the disengaging position.

In the drawings 1 indicates the frame of the loom at the top of which there is located in the known manner the jacquard mechanism 2. On the rock shaft 3 there are also mounted in the known manner over the whole width of the loom at regular intervals apart the tying or weaving members which in the example of construction consist substantially of the color setter 4, the cutting tools 5, 6 and the thread drawing clamps 7, 7'. At the bottom of the color setter 4 there is provided a plurality of holes through which the differently colored pile threads 8, 8', 8'' and so forth, from which the tufts are tied, are drawn. In front of each color setter 4 there operate shears 5, 6 which in the known manner carry out an up and down rocking movement and also a cutting movement in that the movable shear 6 is so moved around the shear axis 9 that the shears cut off the pile thread 8 advanced by the thread feeding clamp 7, 7' a few millimeters in front of the color setter 4.

According to the invention there is provided a controlling member which guards the advance of the pile thread 8, the thread guard being preferably located on the movable shear 6. The guard device consists substantially of a movable rod 10 which at its lower end terminates in a transversely disposed foot 11 which, during the normal operation of the loom rests loosely on the corresponding advanced pile thread 8. The rod 10 is held by a bent plate 12, rigidly connected to the movable shear 6 by bolts passing through the holes 13, 14, and guided vertically by bent lugs 15, 16 provided at the upper and lower ends of the plate 12. The guide plate 12 is provided with a cranked arm 17 having a guide slot 18 in which a guide pin 19, rigidly connected to the rods 10 of the guard device, can reciprocate vertically.

As is usual in looms of this type, a pair of gripping jaws 37 are provided which are advanced to grip the thread in front of the shears as soon as it is drawn out. These jaws support the thread after it has been cut and thus prevent the dropping of the movable rod 10 provided a thread has been drawn out, permitting this rod to drop only on the occasion of a failure of the thread.

More particularly, two pairs of these jaws are preferably provided in the manner shown in the patent to Banyai, No. 1,752,140, these jaws serving in the usual manner to carry the thread over to the knotting mechanism.

Above the guide lug 15 the rod 10 is cranked in a suitable manner a number of times, as shown for example in Figs. 2 and 3, so as to terminate in an angular arm 20 of which the front end is formed into an eye 21 open on the inside. The arm 20 together with the upper end of the rod forms an inwardly open angle through which passes a wire 22. The latter is tensioned transversely across the loom frame 1, 1 and electrically insulated from the frame 1.

The position of the transverse wire 22 relative to the angular arm 20 is so selected that the wire 22, during the normal operation of the loom, cannot come into contact with any part of the guard device provided on each of the tying members, as the rod foot 11 rests either on the thread advanced by the thread withdrawing clamps 7, 7' so that the light rod 10, 20, 21 is supported by the pile thread 8 (see Fig. 2) or the arm 20 is prevented from coming into contact with the wire 22 by the upward swinging movement of the shears. If the normal weaving operation is interrupted by the omission of any of the threads 8, 8', 8'' . . . between one of the color setters 4 and one of the clamp pairs 7, 7' then the foot 11 of the corresponding guard does not find any support during its downward movement and falls, as shown in Fig. 3, to such an extent that its arm 20 comes to rest on the transverse wire 22. Now the eye 21 catches the wire 22 during the reciprocating movement of the shear shaft parts 5, 6.

As soon as any of the arms 20, 21 of the guard rod 10 comes into contact with the transverse wire an electric circuit is closed which operates an electric alarm bell 23 and at the same time actuates a lever 24 or a similar device electromagnetically by which the loom is stopped automatically. The current for both purposes is derived from a source of current indicated by — + in Fig. 1, and passes through the conducting wire 25 to a suitable point of the transverse wire 22. As the latter has an insulated suspension the current is interrupted as long as none of the guard 10, 20, 21 comes into contact with the transverse wire 22. If however by reason of the omission of one of the threads 8, 8', 8'' . . . one of the thread guards 10, 20, 21 moves into the position shown in Fig. 3 the circuit is closed as now the entire loom frame becomes current conducting, the current passing through the rods 10, 20, for example through the rock shaft 3 to a switch 26 which is connected by a wire 27 to a magnet 28 and by a wire 29 to the bell 23. Return wires 30, 30a connect the magnet 28 and the bell 23 directly to the source of current.

The magnet 28 actuates by reason of its magnetic force, when the circuit is closed, a small bell crank lever 24 which may be provided at the forward end of the disengaging device 31 located on the loom in the usual manner. When the lower limb of the lever 24 is attracted by the

magnet 28 the upper limb of lever 24 comes in front of the main disengaging device 32 of the loom and thus stops the reciprocation of this device. As soon as the latter stops the whole loom is stopped in the usual manner.

The transverse rod 33 serving to disengage the loom by hand may be used to return the lever 24 into its normal position shown in Fig. 1. For this purpose the transverse rod 33 is connected to the upper limb of the lever 24 by a cord 34.

In place of the locking bell crank lever 24 any other device may be used for automatically stopping the looms through the medium of the guard device, and which is moved by the magnet 28 directly or by means of mechanism connected thereto, into the path of the rocking disengaging lever 32 in order to stop the latter.

It may be mentioned that the method of operation of the switch 26 is only for the purpose of preventing the bell 23 from ringing continuously as a periodically repeated bell signal is more effective. The switch 26 is shown to be mounted on the shaft 3 but it may be provided on any other rocking or rotating shaft of the loom.

The method of operation of the invention will be clear from the foregoing. During normal operation of the tying or weaving members the pile thread guard device reciprocates with the movable shear 6 in such a manner that the guard rod 10, 20, 21 does not come into contact with the transverse wire 22 as the foot 11 of the rod 10 comes to rest on one of the gauze threads 8, 8', 8'' . . . If however for any reason the thread drawing clamps 7, 7' do not engage with one of the threads 8, 8', 8'' . . . the guard rod 10, 20, 21 falls into its lowermost position in which case the bent arm 20 comes into contact with the transverse wire 22. By reason of the oscillatory movement of the shear 6 the eye 21 catches the wire 22 and remains in engagement therewith until released by the operator. By reason of contact of the guard rod 10, 20, 21 with the wire 22 the alarm signal 23 is actuated drawing to the attention of the operator that in a part of the loom one of the pile threads 8, 8', 8'' and so forth has not been engaged by the thread withdrawing clamps 7, 7'. At the same time the loom is stopped by reason of the automatic stopping of the oscillatory movement of the disengaging lever 32.

It is to be noted that the shears are mounted on rocker arms carried by the rock shaft 3. After a thread is cut, the shears are raised back to the position shown in Fig. 2, in which the extension 19 rests in the bottom of the slot 18 and thereby prevents dropping of the rod 10. In this position, the thread previously drawn out is released and the jaws 7 grip and draw out another thread. When this second thread has been drawn out, the shears are lowered to the position shown in Fig. 3. In this position, unless the thread has failed, the rod 10 will be supported by the thread. There is therefore no danger of stopping the loom unless a thread fails.

The technical improvements obtained by the invention reside in the fact that on the occurrence of a defective point due to the omission of tufts this is restricted to a single tuft whereas hitherto numerous tufts were dropped successively. In addition it is also possible for the operator, without any tedious searching to ascertain at which point of the pile thread feed the defect has occurred as the defect must be

at the point at which the transverse wire 22 is engaged by the eye 21 of the guard arm 20. By reason of the invention described there is also obtained a considerable economy in the manufacture of the material.

The invention has been described hereinbefore in connection with a carpet loom. The invention, however, is also applicable to any other types of looms in which the advanced portion of the warp for the purpose of forming the pile is drawn out in the direction of the weft.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. In a loom for the production of carpets and the like, having a threadholder, a threadfeeder to advance the thread step by step from the holder to form the pile of the carpet, and cutting means between said holder and feeder to sever the advanced portion of the thread, that improvement which consists in a feeler normally urged to movement in one direction movably mounted upon said cutting means engaging the thread and held against movement thereby, and means controlled by movement of said feeler, when a thread fails to stop the loom, and to indicate the failure of the thread.

2. In a loom for the production of carpets and the like, having a threadholder, a threadfeeder to advance the thread step by step from the holder to form the pile of the carpet, and cutting means between said holder and feeder to sever the advanced portion of the thread, that improvement which consists in a feeler normally urged to movement in one direction movably mounted upon said cutting means engaging the thread and held against movement thereby, and means controlled by movement of said feeler, when a thread fails to stop the loom.

3. In a loom for the production of carpets and the like, having a threadholder, a threadfeeder to advance the thread step by step from the holder to form the pile of the carpet, and cutting means between said holder and feeder to sever the advanced portion of the thread, that improvement which consists in a feeler normally urged to movement in one direction movably mounted upon said cutting means engaging the thread and held against movement thereby, and means controlled by movement of said feeler, when a thread fails, to indicate the failure of the thread.

4. In a loom for the production of carpets and the like, having a threadholder, a threadfeeder to advance the thread step by step from the holder to form the pile of the carpet, and cutting means between said holder and feeder to sever the advanced portion of the thread, that improvement which consists in a feeler normally urged to movement in one direction movably mounted upon said cutting means engaging the thread and held against movement thereby, the movement of said feeler, which results when a thread fails, being utilized to control the operation of any appropriate mechanism.

5. In a loom for the production of carpets and the like, having a threadholder, a threadfeeder to advance the thread step by step from the holder to form the pile of the carpet, and shears between said holder and feeder, one of said shears being movable to sever the advanced portion of the thread, that improvement which consists in a guard device to indicate failure of a thread including a feeler normally urged to movement mov-

ably mounted upon said movable shear engaging the advancing portion of the thread and held from movement thereby, and electrical means controlled by movement of the feeler, when the thread fails, to operate an indicating element.

6. In a loom for the production of carpets or the like, having a plurality of weaving units, each of said units including means to form a carpet zone by step-by-step feeding of an individual thread to form the pile of the carpet, and sets of shears to sever the advanced thread, one of the shears of each set being movable, that improvement which consists of a guard device to indicate failure of a thread, including individual contact members one in each unit normally urged to movement movably mounted on the movable shears engaging the thread of the corresponding unit and held against movement thereby, a common stationary contact member comprising a wire stretched across the loom in the path of movement of the individual contact members, each of said individual contact members having a curved portion partially surrounding the wire and normally held away from the wire but adapted to engage the same, when a thread breaks, to close an electric circuit.

7. In a loom for the production of carpets or the like, having a plurality of weaving units, each of said units including means to form a carpet zone by step-by-step feeding of an individual thread to form the pile of the carpet, and sets of shears to sever the advanced thread, one of the shears of each set being movable, that improvement which consists of a guard device to indicate failure of a thread, including individual contact members, one in each unit, said contact members being movably mounted on the movable shears and normally urged to movement, each of said contact members engaging the thread of the corresponding unit and being held against movement thereby, a common stationary contact member comprising a wire stretched across the loom in the path of movement of the individual contact members, each of said individual contact members having a curved portion partially surrounding the wire and normally held away from the wire but adapted to engage the same, when a thread breaks, to close an electric circuit, said curved portion terminating in a hook to catch upon the wire to preserve the contact and to limit the dropping movement of the individual contact member.

8. In a loom for the production of carpets or the like, having a plurality of weaving units, each of said units including means to form a carpet zone by step-by-step feeding of an individual thread to form the pile of the carpet, that improvement which consists in a guard device to indicate the failure of the thread, including individual contact members one in each unit, said contact members being movably mounted on the loom and normally urged to movement, each of said contact members engaging the thread of the corresponding unit and being held against movement thereby, a common stationary contact member in the path of movement of said individual contact members and adapted to be engaged thereby, when a thread fails, to close an electric circuit, said common contact member comprising a wire stretched on the loom and insulated therefrom, each of said individual contact members having a curved portion partially surrounding the wire and normally held away from the wire but adapted to engage the same, when a thread breaks, to close an electric circuit, said curved

	portion terminating in a hook to catch upon the wire to preserve the contact and to limit the dropping movement of the individual contact member.	two points between the feeder and the cutting means one adjacent the feeder and one adjacent the cutting means, and a feeler normally urged to movement in one direction movably mounted on said cutting means engaging said thread between said two points and held against movement thereby, the movement of said feeler, which results when a thread fails, being utilized to control the operation of any appropriate mechanism.	80
5	9. In a loom for the production of carpets or the like, a threadholder, a threadfeeder to advance the thread step by step from the holder to form the pile of the carpet, cutting means between the holder and feeder to sever the advanced portion of the thread, means to grip the thread at	FRANZ BREITSCHÄDEL.	85
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