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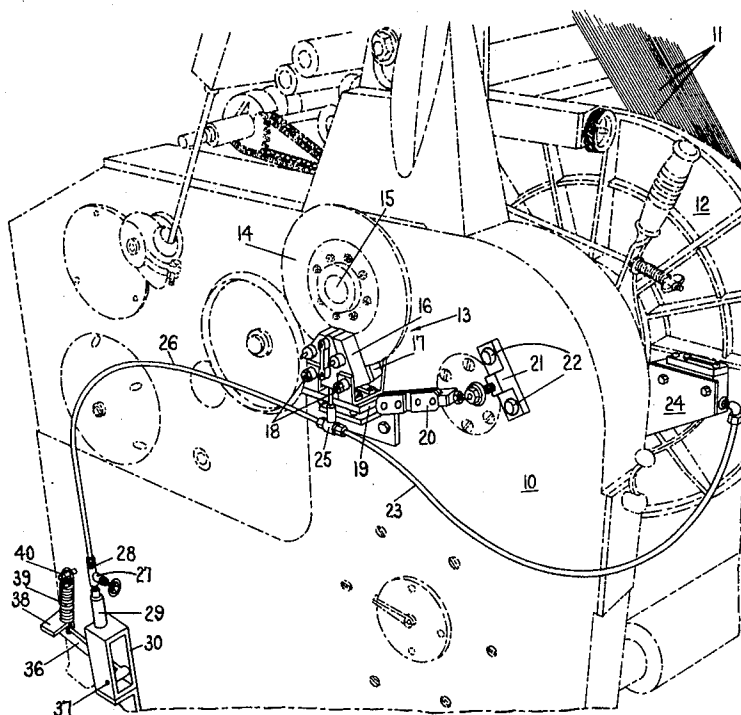
[54] **LETOFF RELEASE MECHANISM**
4 Claims, 3 Drawing Figs.

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ABSTRACT: A selective release mechanism for the braking device of a loom letoff for relieving the restraining forces normally applied to the yarn beam while drawing the warp yarns therefrom.



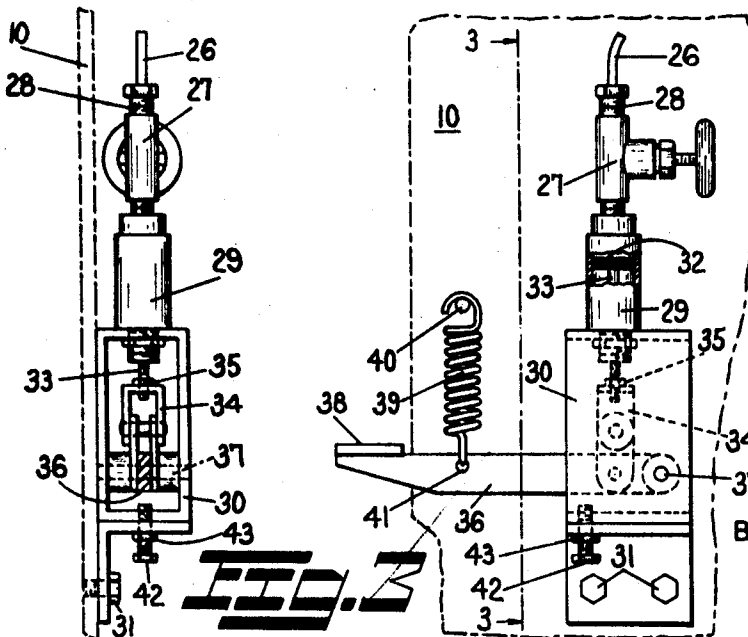
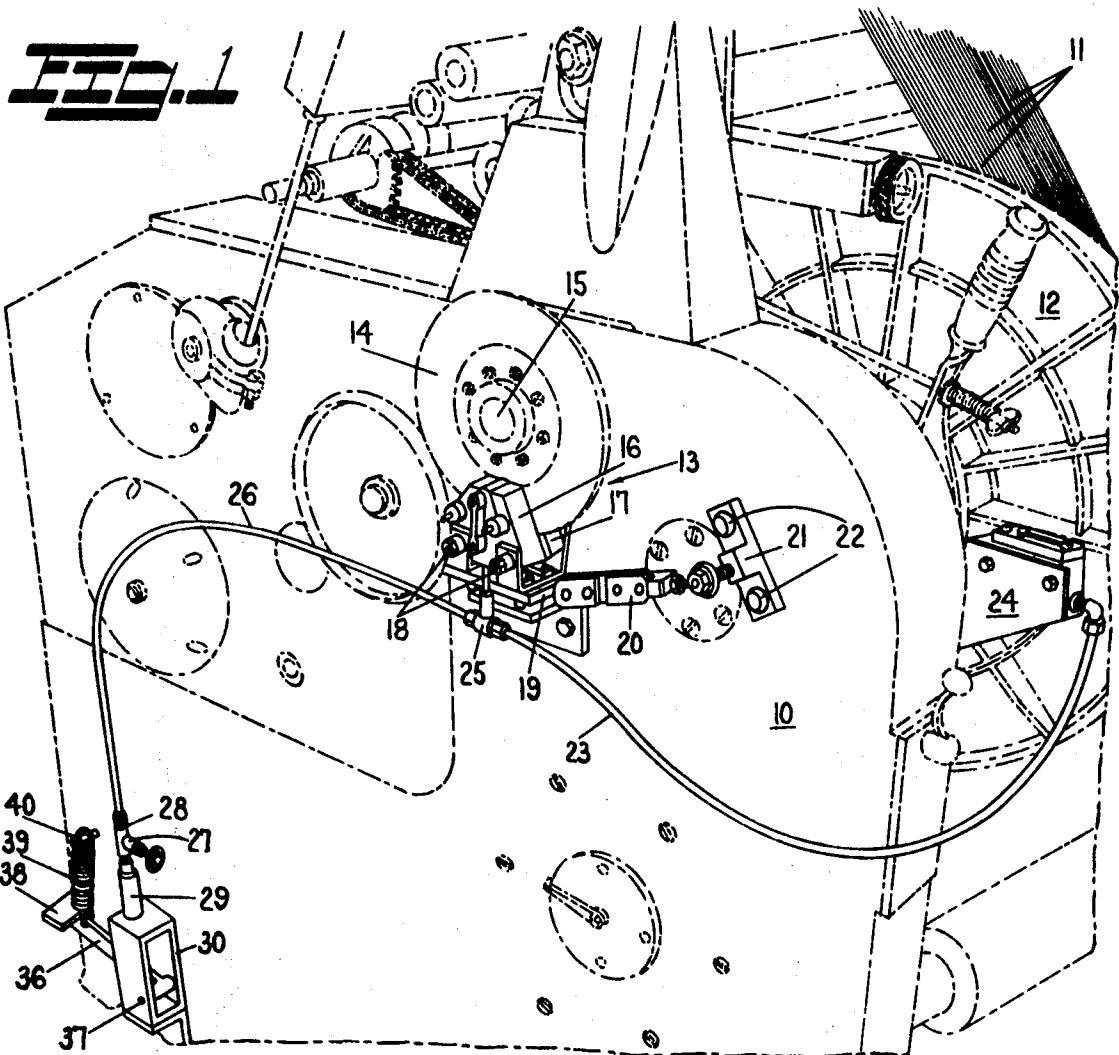


FIG. 2

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LETOFF RELEASE MECHANISM

BACKGROUND OF THE DISCLOSURE

The invention relates to the braking apparatus for a loom letoff mechanism in which restraining forces are applied to the yarn beam so as to draw the warp yarns from said warp beam under a desired amount of tension. More particularly, the invention pertains to a letoff release mechanism which removes these restraining forces on the yarn beam and permits it to be turned freely for any number of known reasons, such as drawing off a nearly empty beam, advancing the warp, taking up slack, adjusting tension, etc.

As is well known to those conversant with the weaving art various types of braking devices are utilized to apply restraining forces to a yarn beam so that the warp yarn as it is withdrawn therefrom is maintained under a desired amount of tension. Such devices have included the use of weights, friction discs, adjustable brake bands as well as caliper-type braking arrangement to which the instant invention is applicable.

The known means for releasing the restraining forces upon a yarn beam required the removal of weights, loosening of the brake bands or, in the case of the friction discs, declutching the driving media from said discs.

The caliper-type brake with which the letoff release mechanism of the present invention is adapted to cooperate is hydraulically controlled and, by simply depressing a lever, the volume within the hydraulic system is increased to the extent of completely removing the restraining forces to which the yarn beam is subjected.

SUMMARY OF THE INVENTION

The letoff release mechanism of the present invention forms a part of a hydraulically controlled caliper-type braking system the function of which is to apply restraining forces to a disc that is fixed to rotate with the yarn beam.

These forces do not permit the yarn beam to rotate freely and the warp yarn as it is withdrawn is held under a desired amount of tension.

The mechanism includes a hydraulic cylinder carried by a bracket attached to the loom and a spring-biased pivotable lever for actuating the piston within said cylinder. By simply depressing the lever downwardly the volume within the hydraulic system is increased so as to displace the fluid therein to the extent of completely removing the restraining forces to which the disc is subjected. A shutoff valve can be manually set to maintain the disc in a state relieved of the restraining forces and when turned on the motion of the spring biased pivotable lever returning to its initial position will move the piston to force the fluid into its initial area thereby reapplying the restraining forces to the disc.

It is a general object of the invention to provide a letoff release mechanism which is selectively controllable for removing the restraining forces normally applied to the yarn beam while drawing the warp yarns therefrom.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective view of a portion of the right-hand side of a loom showing the mechanism according to the invention applied thereto,

FIG. 2 is a view in side elevation of the hydraulic cylinder and spring-biased lever for its actuation, and

FIG. 3 is an end view of the mechanism shown in FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawing wherein only as much of conventional loom structure is depicted as is necessary to a complete understanding of the invention, there is shown in FIG. 1 a portion of the right-hand loomside at 10.

The yarn beam from which warp threads 11 are drawn is also partially shown and identified by numeral 12. This yarn beam is supported in a conventional manner to traverse the

distance between the loomsides and the ends thereof (not shown) are journaled in suitable bearings (also not shown) that are attached to the inner walls of the loomsides.

A friction-type letoff device is shown generally at 13 and is of the caliper-type brake design which is a known means for applying restraining forces to a yarn beam to enable the warp threads to be withdrawn therefrom under tension. The letoff device includes a disc 14 which is fixed on and adapted to rotate with a shaft 15 that is driven by any suitable means which in the instant case is gearing (not shown). This gearing is in driving relation with the yarn beam gear (also not shown) and any frictional restraint or release applied to the disc 14 will be transmitted to and affect the yarn beam in a similar manner.

The letoff device further includes opposed housings 16 and 17 (FIG. 1) which are attached one to the other by means of bolts 18 and with a space therebetween through which the disc 14 is adapted to rotate. Each of the housings include a so-called brake puck (not shown) disposed in opposed relation with at least one of said pucks being movable by hydraulic pressure toward the other to frictionally engage the sides of disc 14.

Housings 16 and 17 are mounted on a bracket 19 which in turn is supported by an arm 20 that forms a part of an adjustable mounting bracket 21 that is attached to the loomside 10 as at 22.

Controlled hydraulic pressure is furnished to one or the other or both of the housings 16 and 17 through a line or tube 23 from a first hydraulic means comprising a master cylinder 24. Tube 23 is attached to a T-fitting 25 that depends from housing 16.

A second hydraulic line or tube 26 is attached to the T-fitting 25 and extending therefrom, the opposite end attaches to the upper end of a shutoff valve 27 as at 28. The lower end of the shutoff valve 27 assembles in the top of a hydraulic dump cylinder 29 which is fixed to the top of a boxlike support bracket 30. Dump cylinder 29 serves as a second hydraulic means and acts as a release for the frictional forces on rotating disc 14. This support bracket is assembled to the lower forward side of the loomside 10 by means of capscrews 31 (FIGS. 2 and 3).

A portion of the cylinder 29 in FIG. 2 is broken away to show a vertically slidable piston 32 therein which includes a centrally disposed and downwardly extending stem 33. The lower portion of the stem 33 is threaded and protrudes through the lower end of the cylinder 29 and into the boxlike structure of the support bracket 30. A U-shaped lever bracket 34 assembles on the lower end of the stem 33 and is maintained thereon by the assistance of a stop nut 35.

One end of a foot lever 36 is pivotably supported within the support bracket 30 by means of a horizontally disposed pin 37 the ends of which assemble in aligned apertures in the sidewalls of said bracket. Extending in a generally forward direction the foot lever 36 terminates in a horizontally disposed pad 38 and provides a surface for pivoting said lever downwardly simply by pressing on it with one's foot. The foot lever 36 is biased in an upwardly direction by means of a coil spring 39 having the upper end thereof attached to a pin 40 which extends from the loomside 10 and the lower end assembled in an aperture 41 provided in and intermediate the ends of said lever.

A stop screw 42 and check nut 43 assemble in the lower horizontal surface of the support bracket 30 and extending upwardly into the boxlike structure thereof said screw provides an adjustable stop for limiting the pivoting movement of the foot lever 36.

In operation disc 14 is continually rotating with shaft 15 and as heretofore described this motion is transmitted through gearing (not shown) to effect rotation of the yarn beam 12. Hydraulic pressure is applied to housings 16 and 17 and the so-called braking pucks carried therein are adapted to impart a restraining force on the sides of the disc which in effect is transmitted to the yarn beam causing the warp yarns as they

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are drawn from the latter to be maintained under a desired amount of tension.

To release the tension on the warp yarns 11 and to permit the yarn beam 12 to be rotated freely the foot lever 36 is pivoted downwardly by pressing on pad 38. This motion draws the piston 32 within the cylinder 29 downwardly thereby increasing the volume area for the hydraulic fluid and by displacing it the restraining forces applied by the braking pucks is removed. These restraining forces are maintained in a relieved state by simply closing the shutoff valve 27. When tension is again required so as to resume weaving, the shutoff valve is opened and the biasing force acting upon the foot lever 36 moves it upwardly to its initial position. This motion moves the piston 32 within cylinder 29 upwardly and the volume within the hydraulic system is decreased to automatically restore the restraining forces on the disc 14.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. For a loom including a warp beam from which warp threads are drawn and advanced to the fabric forming area of said loom, a disc fixed for rotation with said warp beam and a caliper-type brake device for applying frictional restraining forces upon opposite sides of said disc, the improvement comprising a letoff release mechanism which includes

a. first hydraulic means for supplying pressure to the caliper-type brake disc,

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b. second hydraulic means for releasing the frictional restraining forces applied to said disc, and

c. a further means for selectively maintaining said disc in a state relieved of said frictional restraining forces.

2. The letoff release mechanism according to claim 1 wherein said second hydraulic means for releasing the frictional straining forces applied to said disc includes

a. a support bracket fixed to said loom

b. a hydraulic cylinder carried by said bracket and interconnected with said brake device by a line containing hydraulic fluid, and

c. a lever member pivotable to actuate said hydraulic cylinder whereby the volume therein is increased and forces applied to said disc relieved.

3. The letoff release mechanism according to claim 2 wherein said lever member is spring biased in a direction to provide a minimum of volume within said cylinder whereby the restraining forces are maintained until actuation of said lever.

4. The letoff release mechanism according to claim 1 wherein said further means includes a shutoff valve connected to said cylinder and line and operable to selectively prevent the return of said lever to its initial position after actuation thereof.

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