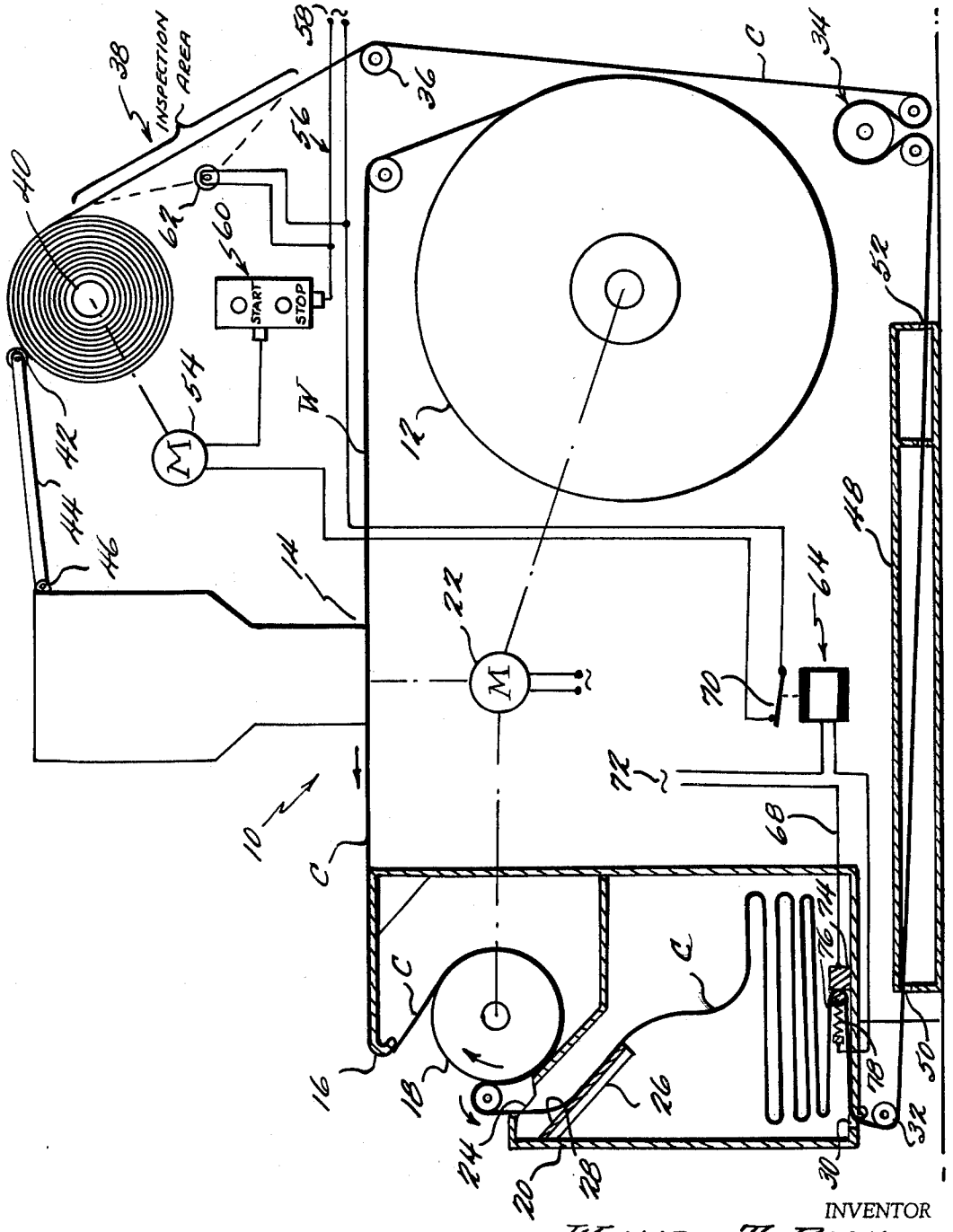
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LOOM WITH INSPECTION STATION AND INDEPENDENTLY OPERABLE TAKE-UP MECHANISM

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INVENTOR

WILLIAM T. BARNETT

BY Cushman, Darby & Cushman

ATTORNEYS

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LOOM WITH INSPECTION STATION AND INDEPENDENTLY OPERABLE TAKE-UP MECHANISM

William T. Barnett, High Point, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C., a corporation of Delaware

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ABSTRACT OF THE DISCLOSURE

A loom with a take-up or cloth roller operable independently of the usual loom operating means. A storage or scray box is provided at the front of the loom for receiving cloth as the cloth is made, the cloth being fed upon demand from the storage box to the take-up or cloth roller upon which it is wound. An inspection station is positioned intermediate of the cloth roller and the storage box and the inspector has control of the cloth roller independent of the normal operation of the loom so that inspection may be made close to the fell of the cloth. Means are provided to insure an ample supply of cloth in the storage box and thereby eliminate any unnecessary tension on the cloth between the fell of the cloth and and the inspection station when the inspector catches up to the output of the loom.

The present invention relates to improvements of looms and, more particularly, to an improvement of the taking up of cloth on the cloth roller whereby inspection of the cloth may be accomplished at the loom close to the fell of the cloth.

Heretofore, fabrics woven on conventional looms that required finishing followed a fairly basic route from weaving to finish. The cloth made on the conventional loom was wound on a take-up or cloth roller in maximum cut lengths ranging from 80 yards on heavy types of fabric to 600 yards on casement types of fabric. When the take-up or cloth roller was filled, it was doffed and taken to a cloth room remote from the loom where it was inspected for the purpose of controlling the quality on the loom. Oftentimes several work shifts would elapse before inspection took place and, consequently, if subsequent inspection of the cloth indicated that a particular loom needed to be adjusted to improve quality, the loom, which may have been running continuously in the interim, would have produced a considerable amount of cloth that had to be discarded or graded as seconds.

An object of the present invention is to provide an improved loom having an inspection station thereon whereby cloth produced by the loom may be inspected close to the fell of the cloth so that if the inspection determines that adjustment should be made to the loom, such adjustment can be immediately accomplished thereby materially reducing the quantity of seconds or waste cloth.

Another object of the present invention is to provide a loom with a take-up or cloth roller operable independently of the operating means for powering the loom, the loom being provided with a storage or scray box which permits intermediate storage of cloth so that there can be a lag-time factor between the fell of the cloth and the winding of the cloth on the cloth roller. This permits inspection of the cloth prior to doffing from the loom.

Ancillary to the immediately preceding object, it is a further object of the present invention to provide a loom with an inspection station, the mechanism for taking up the cloth on the cloth roller being such that the inspector

can control the movement of cloth past the inspection station. Since the inspection time for inspecting cloth is only about 35% of the time involved in the making or weaving of cloth on the loom, the present system enables one inspector to control inspection of several simultaneously operating looms.

A further object of the present invention is to provide a loom with an improved cloth takeoff mechanism operable independently of the conventional operating means for powering the loom, the mechanism having means incorporated therein to insure that too much tension is not placed on the cloth during takeoff and/or inspection.

Still another object of the present invention is to provide an improved loom with an inspection station, the loom reducing the labor involved in the overall weaving and finishing operation and the loom also increasing the quality and quantity of work at the looms.

These and other objects and advantages of the present invention will appear more fully in the following specification and claims.

The sole figure of the accompanying drawing is a diagrammatic side elevation and sectional view of the loom of the present invention.

The loom of the present invention is generally designated at **10** and is a conventional loom for weaving cloth, although it may be of the type of needling a non-woven cloth. In more detail, the loom is provided at its rear end with a warp beam **12** from which warp ends W are fed through the usual harness needles and reed. The filling is shot across the warp in a shuttle and is settled in place by the reed and lay at **14**. A breast beam **16** is provided at the front end of the loom, the breast beam usually being a bar or rail over which the woven cloth C in open width passes before going downward to and about a sand roller **18**. The function of the sand roller **18** on a conventional loom is to smoothly draw the woven cloth forward and deliver it to the take-up or cloth roller. However, in the present invention the take-up or cloth roller usually mounted beneath the sand roller **18** is omitted and replaced by a storage or scray box **20** which will be described later in the specification.

The loom **10** is provided with a loom operating means or motor **22** which through suitable drives operates the warp beam **12**, the harnesses (not shown), the shuttles (not shown), the sand roller **18**, and the like. A further detailed description of the overall operation of the loom **10** to produce cloth C is not believed necessary to an understanding of the invention. It will suffice to say that the various elements of the loom operable by the loom operating means **22** are all operated in timed relationship to one another so that cloth can be continually produced on the loom and fed from the same as it is being produced.

The storage or scray box **20** is positioned generally below the sand roller **18**, the box extending across the entire width of the loom. An inlet opening **24** is provided in the upper portion of the storage box **20** adjacent the front wall of the same. Inlet opening **24** extends completely across the width of the storage box **20** so that the cloth C may be fed into the storage box in open width. A guide member **26** suitably supported adjacent the front wall of the storage box **20** is provided within the storage box immediately below the inlet opening **24**. The guide member **26** has a planar cloth-receiving upper surface **28** which angularly extends in a downward sloping direction toward the rear wall of the storage box so that the cloth C is fed into the box toward the rear wall of the same and when sufficient cloth has been fed in this direction, it will fold back and forth upon itself as shown in the drawings. A discharge opening **30** extends across the bottom of the storage box **20**, the discharge opening having a width at

least as wide as the cloth so that the cloth can be threaded therethrough and discharged in open width.

In order to prevent the cloth passing completely about the sand roller **18** from lapping back on the same, a press roller is provided immediately above the inlet opening **24** of the storage box **20** and the cloth C travels about the press roller downwardly through the opening **24** onto the cloth-receiving surface **28** of the guide member **26**. Immediately below the discharge opening **30** of the storage box **20** there is provided an idler roller **32** about which the cloth is directed, the cloth being directed toward the rear of the loom beneath the loom. A set of draw rolls **34** located under and slightly to the rear of the warp beam **12** receives the cloth C passing under the loom **10** and directs the cloth C upwardly and over an idler roll **36** past an inspection station or area **38**. The cloth is then wound onto a take-up or cloth roller **40**, the cloth roller **40** being independently driven relative to the loom operating means **22**. A press roller **42** carried on the end of an arm **44** pivoted to the frame of the loom at **46** bears on the cloth C and maintains the same smooth as it is being wound on the take-up or cloth roller **40**.

In order to protect the cloth from dirt or grease dropping off of the working parts of the loom, an enclosed pan **48** is positioned under the loom. The pan **48**, which defines a tunnel for the cloth, is provided with an inlet opening **50** for receiving the cloth and an outlet opening **52** for discharging the cloth onto the draw rolls **34**. Draw rolls **34** may be positively driven off of the cloth roller **40** or they may be idler rolls.

An electric motor **54** operatively connected to the cloth roller **40** by a suitable drive rotates the same when energized. In more detail, the electric motor **54** is provided with a control circuit generally designated at **56** and connected to a suitable source of power at **58**. The control circuit has a start-stop switch **60** positioned adjacent the inspection station **38** so that the inspector can control the operation of the cloth roller **40** and, thus, the movement of cloth past the inspection station **38** to suit his demands. The control circuit **56** may also be utilized to provide current for lights **62** at the inspection station **38**, the lights being positioned behind the cloth C if so desired.

Since the inspector can inspect cloth faster than the loom **10** can produce the cloth, means are provided to insure against the motor **54** operating when there is not a sufficient quantity of cloth C stored in the storage box **20**. In other words, means are provided to prevent too much tension being applied to the cloth from the fell of the cloth at **14** through and to the inspection station **38**. In this respect, a relay **64** having a control circuit **68** is provided, the relay actuating a switch **70** in the control circuit **56** to open the same and stop the motor **54**. The control circuit **68** for relay **64** is normally energized from a suitable source of power **72** but it may be de-energized when the tension on the cloth C becomes too great. A fixed contact or copper plate **74** in the circuit **68** is provided within the storage box **20**, the fixed contact normally engaging at least an end of a steel rod **76** about which the cloth C passes just prior to being discharged through the opening **30** of storage box **20**. The rod **76**, which forms a second movable contact, has a width slightly greater than the width of the cloth so that engagement between the rod **76** and contact **74** may be made at least at one of the ends of the rod. The rod **76** is spring urged by a spring **78** toward the contact **74**.

It will now be apparent that when there is sufficient cloth in the storage box **20** and the cloth is threaded behind the rod **76**, the ends of the rod will be in engagement with the copper plate contact **74** and the circuit **68** will close so that the relay **64** is energized to close the switch **70** in circuit **56**. However, when a safe supply of cloth is exhausted from the storage box **20**, the tension of the cloth about the rod **76** will increase causing the rod to move against the spring tension of spring **78** away from the contact **74** thus opening the circuit **68** to the relay **64**, the relay being de-energized to open the switch **70** causing the motor **54** to stop. The inspector at this time will know that he has caught up with the production of the loom and thus he can go to an adjacent loom and inspect cloth on the same. When this condition exists the loom will still be continually operating but cloth will not be discharged from the storage box **20**, the supply being again built up in the storage box **20**. The rod **76** will move back toward the contact **74** as the tension on the cloth decreases until contact is made. When this occurs, the inspector can then restart the motor **54** and continue his inspection at the inspection station **38**.

The loom of the present invention heretofore described and illustrated diagrammatically in the drawing fully and effectively accomplishes the objects and advantages of the present invention. It will be realized, however, that the foregoing specific embodiments have been shown and described for the purpose of illustrating the principles of the invention and are subject to some changes and modifications without departing from such principles or from the spirit of the invention.

Therefore, the terminology used throughout the specification is for the purpose of description and not limitation, the spirit and scope of the invention being defined in the claims.

What is claimed is:

1. In a loom having a warp beam at its rear end, a breast beam and a takeoff roller at its front end, and loom operating means, the improvement comprising: a storage box positioned at the front of the loom generally beneath the breast beam and takeoff roller and having an inlet opening for receiving cloth fed by the takeoff roller, said storage box having a discharge opening for discharging cloth therefrom; a cloth roller upon which cloth passing from said discharge opening of said storage box is wound; an inspection station between said cloth roller and said storage box; and selectively operable drive means to rotate said cloth roller independent of said loom operating means whereby said cloth roller can be stopped to allow the movement of the cloth to be stopped at said inspection stations as said loom operating means continues to operate and cloth is fed into and stored within said storage box.

2. A loom as claimed in claim **1** in which said cloth roller is positioned at the rear end of said loom generally above said warp beam and wherein said inspection station is at the rear end of said loom.

3. A loom as claimed in claim **2** including means about which the cloth is fed from said storage box beneath said loom to said cloth roller.

4. A loom as claimed in claim **3** including means for shielding the cloth when the cloth is passing beneath said loom from said storage box to said cloth roller.

5. A loom as claimed in claim **4** wherein said shielding means includes an enclosed pan positioned beneath said loom and having an inlet at one end for receiving the cloth and an outlet at the other end for discharging the cloth.

6. A loom as claimed in claim **1** including means within said storage box and operable by a predetermined tension on cloth being discharged therefrom for rendering said cloth roller drive means inoperative.

7. A loom as claimed in claim **1** in which said inlet opening for said storage box is positioned adjacent the top thereof and where said discharge opening for said storage box is positioned adjacent the bottom of said storage box, said storage box having a guide member positioned therein adjacent the inlet opening, said guide member having a planar cloth receiving surface extending in a downwardly sloping direction whereby cloth fed into the storage box will form folds therein.

8. In the loom having a warp beam at its rear end, a breast beam and a takeoff roller at its front end, and loom operating means, the improvement comprising: a storage box positioned at the front of the loom generally beneath said breast beam and said takeoff roller and having an inlet

opening for receiving cloth fed by the takeoff roller, said storage box having a discharge opening for discharging cloth therefrom; means for guiding the cloth discharged from said storage box beneath the loom; a cloth roller positioned at the rear of the loom generally above the warp beam and upon which cloth passing beneath the loom for the storage box is wound; and inspection station at the rear end of the loom for inspecting the cloth as it is being wound on said cloth roller; an electric motor for driving said cloth roller independent of said loom operating means; and a control circuit for said motor and including a selectively operable switch means positioned at said inspection station whereby said cloth roller can be stopped to allow the movement of the cloth to be stopped at said inspection station as said loom operating means continues to operate and cloth is fed into and stored within said storage box.

9. A loom as claimed in claim **8** in which said control circuit includes a relay, and means in said storage box operable by a predetermined tension on cloth therein for causing said relay to open said control circuit and stop said motor.

10. An apparatus as claimed in claim **9** in which said means in said storage box includes a first contact, a rod about which cloth in said storage box passes just prior to discharge therefrom, a second contact on said rod, spring means normally urging said rod toward said first contact with said second contact engaging said first contact, and a control circuit for said relay, said control circuit including said first and second contacts.

11. A loom as claimed in claim **10** including an enclosed pan positioned beneath the loom and having an inlet for cloth at one end and an outlet for cloth at the other end, said pan shielding the cloth as it passes beneath the loom from the storage box to the cloth roller.

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JAMES KEE CHI, Primary Examiner

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