

[54] **TERRY CLOTH TAKE-UP MOTION FOR WEAVING MACHINE**

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[51] **Int. Cl.**..... **D03j 1/00**

[58] **Field of Search**..... **139/291 R, 304-308**

[56] **References Cited**

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### [57] ABSTRACT

The weaving machine is provided with a means between the fell and the cloth draw-off roller for turning down or flattening out the loops in the cloth. By turning down or flattening the loops, lateral creep of the cloth on the draw-off roll is prevented and thus any consequent creasing of the cloth on the beam is avoided.

**9 Claims, 5 Drawing Figures**

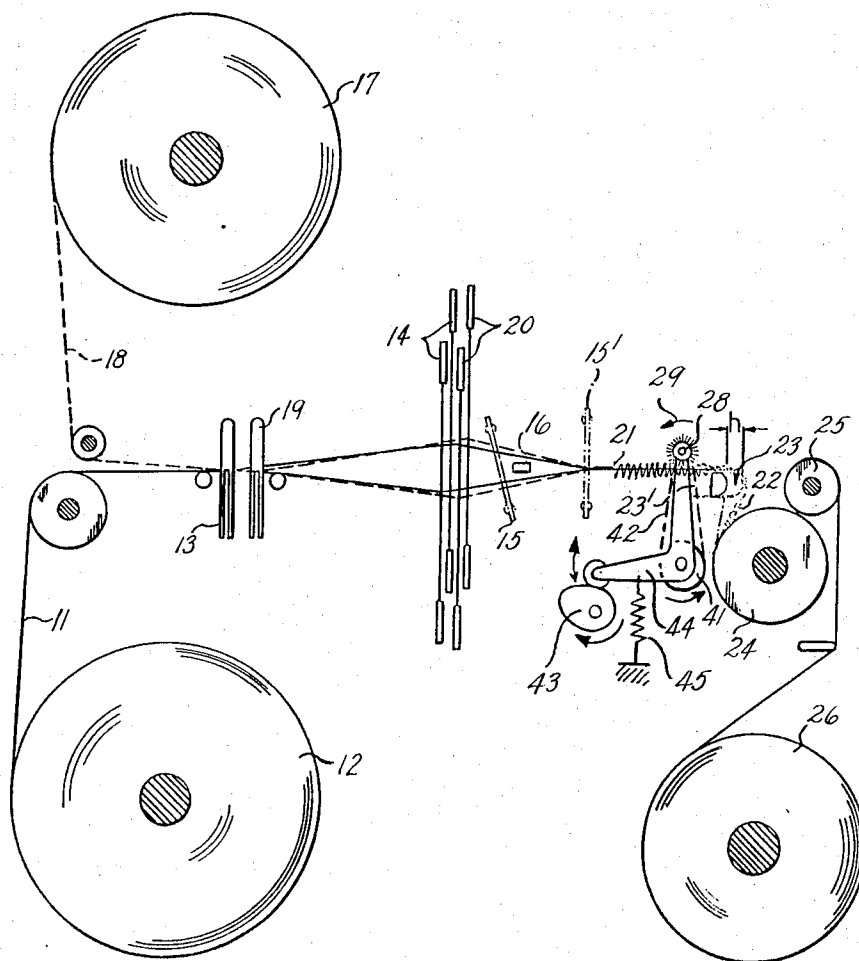


FIG. 1

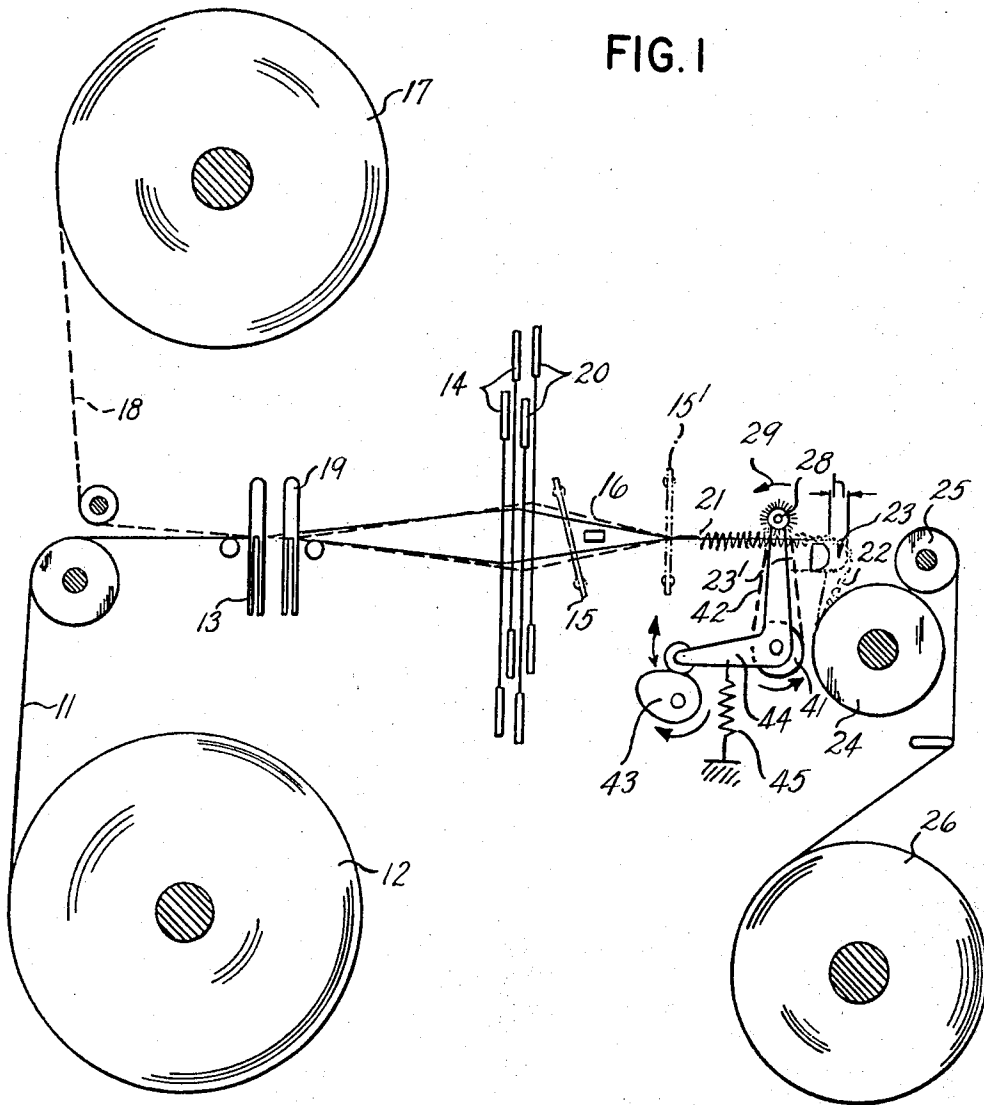


FIG. 2

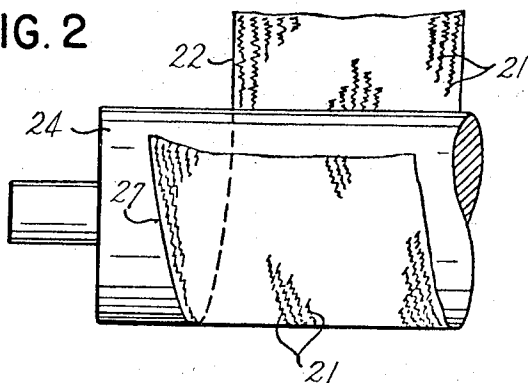


FIG. 3

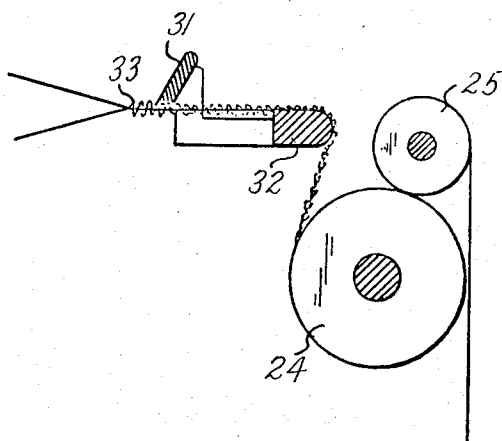


FIG. 4

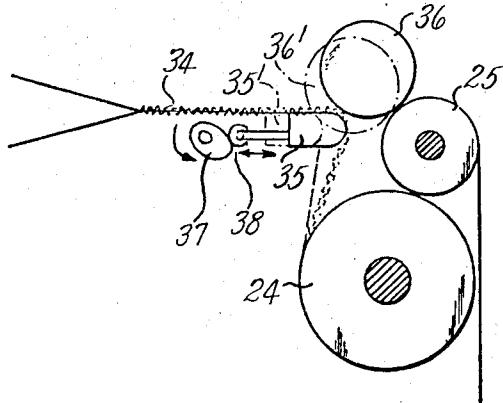
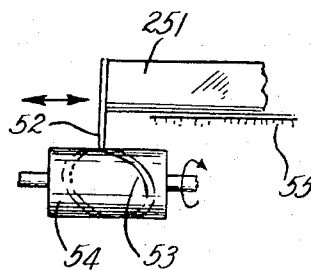


FIG. 5



# TERRY CLOTH TAKE-UP MOTION FOR WEAVING MACHINE

This invention relates to a weaving machine for making terry cloth.

Weaving machines for making terry cloth, that is, cloth having loops formed from a pile warp on one or both sides, have usually formed the loops during weaving by suitably controlling the blow of the reed or by superimposing a reciprocating cloth motion on the normal taking up of the cloth. However, in the case of weaving machines which use corundum-coated draw-off rollers instead of porcupine rollers, it has been found that such machines often suffer from an undesirable phenomenon, particularly if dressed yarn which forms relatively hard loops is used for the pile warp. That is, the cloth formed does not run onto the cloth draw-off roller straight, but creeps to one side or the other while being taken up. This has caused creasing of the cloth and makes it difficult or impossible to wind the cloth satisfactorily on to the cloth beam.

Accordingly, it is an object of the invention to prevent lateral creeping of a formed terry cloth during take-up in a weaving machine.

It is another object of the invention to avoid creasing of a terry cloth during take-up on a cloth beam of a weaving machine.

Briefly, the invention provides a means for turning-down or flattening the loops of a formed terry cloth between the fell area and the cloth draw-off roller, at least on the side of the cloth which faces the cloth draw-off roller, in a direction and to an extent sufficient to prevent lateral creeping on the draw-off roller.

The invention is based on the surprising realization that lateral creep of the cloth web, as the web runs on to the draw-off roller, can be produced intentionally by turning down or flattening the pile loops in a particular direction relative to the direction of the warp. That is, the cloth can be made to creep either to one side or the other, depending on the direction in which the loops are turned down. Once this is realized, it is possible to prevent lateral creeping by suitably turning down or flattening the pile warps in a manner to counteract the lateral creeping forces. This also has the advantage, particularly if the yarn tension is low, of reducing the risk of loops being pulled out or shifted out of position.

In many cases, it is sufficient to run the pile loops back towards the cloth being taken off. It may also be an advantage if the means used to turn-down or flatten the loops is such as to turn the pile loops down in a predetermined direction relative to the warps, i.e. not necessarily parallel to the warps. Advantageously, also, the turning-down or flattening means is provided with a drive which imparts a working movement thereto relative to the cloth web.

In one embodiment, the means for turning-down or flattening the loops is brush-like, more particularly in the form of a rotatable brush. Alternatively, the means may be strip-like, in which case the means may be reciprocated in the direction of the cloth, possibly with an additional motion component transverse to the cloth.

In another convenient and simple embodiment, the turning-down means is in the form of a roller which, in a weaving machine having a breast beam which is reciprocated in order to form the loops, bears on the breast beam and on a pinch roller associated with the

cloth draw-off roller with its axis parallel to the breast beam and pinch roller.

These and other objects and advantages of the invention will become more apparent from the following detailed description and appended claims taken in conjunction with the accompanying drawings in which:

FIG. 1 diagrammatically illustrates a weaving machine for terry cloth utilizing a turning-down means situated between the fell area and the breast beam in accordance with the invention;

FIG. 2 illustrates the manner in which a cloth can creep across a draw-off roller in a weaving machine in the absence of a turning-down means of the invention;

FIG. 3 illustrates a side view of a rail rigidly connected to a breast beam for turning-down or flattening pile loops in accordance with the invention; and

FIG. 4 illustrates a side view of a loop turning-down or flattening means according to the invention in roll form.

FIG. 5 shows a driving device for reciprocating the turning-down means with an additional motion component transverse to the cloth web.

Referring to FIG. 1, the terry cloth weaving machine utilizes a ground warp 11 which runs off a ground warp beam 12 and passes through a row of warp stop motion droppers 13, heald shafts 14 used for shedding, and a reed 15. As viewed, the shed is open. A weft is picked by a shuttle 16. In known manner, pile loops 21 are formed from a pile warp 18, which runs off a pile warp beam 17 and passes through another row of stop motion droppers 19, heald shafts 20 and the reed 15. In the embodiment illustrated, the pile loops 21 are formed by means of a reciprocating motion superimposed on the normal take-up motion of the cloth 22 and produced by means of a periodically reciprocating breast beam 23. To this end, the breast beam 23 or 35 has a drive (as shown in FIG. 4) which can transfer the beam 23 over a distance  $h$  from a limit position as illustrated into a position 23' or 35' respectively as shown by chain lines. The reed 15 is driven to be moved into the position 15' indicating the fell area after every pick. On leaving the breast beam, the cloth 22 runs onto a cloth draw-off roller 24, which is driven in a known manner at a speed corresponding to the formation of the cloth. From the cloth draw-off roller 24, the cloth runs over a pinch roller 25 and is wound onto a cloth beam 26.

Referring to FIG. 2, without any other restraint, the terry cloth 22 with the loops 21 would tend to creep to one side (as shown by the position of the selvage 27) during taking up under the influence of the loops which, as they run onto the cloth draw-off roller 24, would be turned down in a direction such as to promote creep.

Referring again to FIG. 1, in order to prevent creep, a turning-down means in the form of a brush 28 is provided between the fell area, indicated by reed position 15', and the breast beam 23. The brush 28 may be stationary, in which case the loops 21 passing beneath the brush 28 are turned back towards the shed. Alternatively, the brush 28 may be driven, particularly if experience shows that the cloth cannot be prevented from creeping sideways along the draw-off roller unless the loops are turned down in the opposite direction. In this case, the brush 28 is provided with a suitable driving means (as described later) which causes the brush 28 to rotate in the direction of arrow 29.

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The brush 28 extends over the entire width of the cloth 22 with the longitudinal axis thereof transverse to the warps. If it is found that the loops must be turned down in a direction obliquely of the warps to prevent lateral creeping of the cloth along the draw-off roller 27, the brush 28 or other turning-down means may extend over the cloth width obliquely relative to the warps.

Referring to FIG. 3, the turning-down means can be in the form of a strip or rail 31 fixed to the breast beam 32 and mounted over the machine to press against the cloth. Thus, when the cloth passes beneath the strip 31, the pile loops 33 are turned down or flattened towards the shed.

Referring to FIG. 4, in the case where the pile loops 34 of the cloth are formed by means of a mobile breast beam 35 in the same way as in the embodiment shown in FIG. 1, the pile loops 34 can also be turned down or flattened by a roller 36 which bears on the pinch roller 25 and breast beam 35. This roller 36 is shown with its axis parallel to the pinch roller 25 and breast beam 35. When the breast beam 35 moves into the position 35' shown with chain-lines, the roller 36 drops into the position 36' shown with chain-lines. By means of the bearing pressure and the movement illustrated, the roller 36 turns the pile loops 34 down in the opposite direction to the direction of cloth take-off, again ensuring that the cloth runs onto the cloth draw-off roller 24 straight.

The invention is not restricted to the embodiments illustrated. For example, it is not always necessary to turn all the pile loops down in the same direction in order to ensure that the cloth web runs straight. In many cases, moreover, it is enough to flatten the loops rather than to turn them down in one direction only. Also, the invention is not restricted with regards to the manner in which the loops are formed as the invention can also be applied to terry weaving machines in which the loops are formed by means of a specially controlled reed motion.

Lastly, in the case of terry cloth with loops on both sides, it may be an advantage in some cases to use a similar means as above to turn down or flatten the loops on that side of the cloth which is remote from the surface of the draw-off roller when running onto this roller. If a reciprocating oscillating motion of the breast beam or of the means for turning down or flattening the pile loops, relatively to the cloth, and/or a rotation of these means is desired such a motion might be produced by any suitable known kind of a reciprocating device, such as a cam drive, an excenter, a crank, an elliptical groove, a worm gear, a chain drive or a combination of same. FIG. 1, for example, shows a brush roller 28, rotated by means of a sprocket wheel 41 and a chain 42, and supported by a two-arm lever 44 which in turn is oscillated lengthwise, relative to the cloth web, by means of a cam drive 43 and a spring 45. The breast beam 35, in FIG. 4, could be reciprocated in a direction parallel to the warp threads by means of a cam drive 37 and a rod 38. In FIG. 5, the turning down means, which might be a strip or rail 51, bears a prong 52 engaged in an elliptical groove 53 on the surface of

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a rotatable cylindrical roller 54, which imparts to said strip a longitudinal reciprocating motion, i.e. transverse to the cloth web 55.

What is claimed is:

1. In combination with a terry cloth weaving machine for making a terry cloth with pile loops and having a fell, a cloth draw-off roller downstream of said fell and a cloth beam downstream of said draw-off roller; a brush positioned between said fell and said draw-off roller and disposed relative to the cloth to turn down the pile loops in a predetermined direction relative to the warp in the cloth at least on the side of the cloth facing said draw-off roller.

2. The combination as set forth in claim 1 wherein said brush is rotatable.

3. The combination as set forth in claim 1 wherein said means includes a drive means for moving said brush relative to the cloth.

4. In combination with a terry cloth weaving machine for making a terry cloth with pile loops and having a fell, a cloth draw-off roller downstream of said fell and a cloth beam downstream of said draw-off roller; means positioned between said fell and said draw-off roller and disposed relative to the cloth to turn down the pile loops in a predetermined direction relative to the warp in the cloth at least on the side of the cloth facing said draw-off roller, said means including a drive for moving said means relative to the cloth.

5. The combination as set forth in claim 4 wherein said means is a rail extending across the machine and engaging said cloth with a rounded edge.

6. In combination with a terry cloth weaving machine for making a terry cloth with pile loops and having a fell, a cloth draw-off roller downstream of said fell and a cloth beam downstream of said draw-off roller; a rail extending across the machine between said fell and said draw-off roller and disposed relative to the cloth to turn down the pile loops in a predetermined direction relative to the warp in the cloth at least on the side of the cloth facing said draw-off roller and a drive for reciprocating said rod in the direction of cloth advance.

7. The combination as set forth in claim 6 wherein said drive includes means for moving said rail transversely of the direction of cloth advance.

8. The combination as set forth in claim 6 wherein said means extends over the cloth obliquely relative to the warps.

9. In combination with a terry cloth weaving machine for making a terry cloth with pile loops and having a fell, a reciprocally mounted breast beam for forming the loops, a cloth draw-off roller downstream of said breast beam, a pinch roller adjacent to and parallel to said draw-off roller, and a cloth beam downstream of said draw-off roller; a roller bearing on said breast beam and said pinch roller in parallel relation to said pinch roller to turn down the pile loops of the terry cloth in a predetermined direction relative to the warp in the cloth at least on the side of the cloth facing said draw-off roller.

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