NEGATIVE YARN FEEDER WITH WEFT-BRAKING DEVICE

Yarn loops are unwound from a stationary weft-winding drum during a weft insertion. A weft-braking device locks the yarn unwinding from the drum at the end of the insertion, and comprises at least one braking member which is arranged by side of the drum near its delivery end and is movable under control of an actuator between a resting position in which it is spaced from the outer surface of the drum and does not interfere with the unwinding yarn, and an operative position in which it engages the outer surface of the drum and cooperates with it to brake the yarn.
NEGATIVE YARN FEEDER WITH
WEFT-BRAKING DEVICE

[0001] The present invention relates to a negative yarn feeder provided with a weft-braking device for locking the unwinding loops of yarn at the final step of the insertion of the yarn into the loom, which step is particularly critical in the case of projectile looms.

BACKGROUND OF THE INVENTION

[0002] As known, the so-called “negative” yarn feeders comprise a stationary drum on which a motorized flywheel winds a plurality of yarn loops forming a weft reserve. Upon request from the loom, the loops are unwound from the drum, then pass through a device for controlling the tension of the yarn, and finally are led to the loom. The yarn feeders of the above type have the essential aim of maintaining the amount of loops substantially constant on the drum, thereby minimizing the tension of the yarn coming from the drum.

[0003] Mainly in the case of projectile looms, the yarn feeder is generally provided with an “anti-ballon” device, which essentially consists of a funnel having the aim of containing the balloon which forms while the yarn is unwound from the feeder. Devices of this type are disclosed, e.g., in EP 0719354, EP 0104138, and EP 1149793. Particularly, in EP 1149793 the anti-ballon funnel has a frustoconical profile defined by a plurality of equally-spaced rods arranged along the generatrices of a frustum of cone, whereby the deposit of dust and the friction against the inner surface of the funnel are reduced.

[0004] As known, during the final step of the insertion, yarn loops in excess are liable to unwind from the drum by inertia. In order to contrast this drawback, it is known from U.S. Pat. No. 3,834,635 to provide the feeder with stationary brushes which are arranged in contact with the inner surface of the anti-ballon funnel. The unwinding yarn passes between the brushes and the funnel and, at the end of the insertion, when the loom has finished drawing yarn, it is braked by friction and consequently retained from further unwinding.

[0005] A drawback of the above device is that the brushes also brake the yarn during the insertion, when no braking action is required but, on the contrary, the yarn should run as freely as possible. This circumstance affects the smoothness of the yarn-feeding process and leads to a growth of dust generated by friction between the yarn and the brushes, which can be made to deposit within the funnel thereby affecting its operation.

[0006] U.S. Pat. No. 3,834,635 also discloses the use of air streams for braking the yarn. However, this solution is very complicated and expensive, because air-feeding means must pass through the swivelling, yarn-winding flywheel.

SUMMARY OF THE INVENTION

[0007] Therefore, it is a main object of the present invention to provide a yarn feeder having a well-braking device which overcomes the abovereferred drawbacks of the known brush-based devices, but which is simpler and cheaper to manufacture than the pneumatic devices.

[0008] The above object and other advantages, which will better appear below, are achieved by the yarn feeder having the features recited in claim 1, while the dependent claims state other advantageous, though secondary features of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The invention will be now described in more detail with reference to a preferred, non-exclusive embodiment shown by way of non-limiting example in the attached drawings, wherein:

[0010] FIG. 1 is a perspective view of a negative yarn feeder provided with a weft-braking device according to the invention;
[0011] FIG. 2 is a front view of the yarn feeder of FIG. 1;
[0012] FIG. 3 is a partial view in cross-section of FIG. 2 along line
[0013] FIG. 4 is a longitudinal view of a portion of FIG. 1;
[0014] FIG. 5 is a view in cross-section of FIG. 4 along line V-V, showing a detail to an enlarged scale of the weft-braking device of the invention.

DESCRIPTION OF THE PREFERRED
EMBODIMENTS

[0015] With reference to the above Figures, a negative yarn feeder 10 comprises a stationary drum 12 and a swivel flywheel 14 which is coaxially supported at one end of drum 12 and is driven by a motor 15 for winding loops of yarn F on the drum, thereby forming a stock S. Yarn F is unwound from drum 12 upon request from the loom, which in the present invention is preferably a projectile loom (not shown).

[0016] A stationary drum 16 longitudinally projects from the motor housing and supports an anti-ballon funnel 18. Anti-ballon funnel 18 consists of a plurality of equally-spaced rods 20 which are arranged along the generatrices of a frustum of cone and have one end attached to a smaller ring 22 defining the smaller base of the frustum of cone, and the opposite end attached to a larger ring 24 defining the larger base of the frustum of cone. A yarn-guide delivery cyclete 25 is arranged at the delivery end of the anti-ballon funnel.

[0017] Funnel 18 is coaxially arranged in front of drum 12 with its larger base facing the delivery end 12a of the drum. The inner surfaces of both smaller ring 22 and larger ring 24 are bevelled, and the innermost circumference of larger ring 24 advantageously has a diameter D smaller than the yarn-winding diameter D of drum 12 (FIG. 3). Funnel 18 is attached to a slide 26 (FIG. 4) which is slideable along stationary drum 16 under control of a screw mechanism (not shown) operable by a knob 28, whereby the axial gap between anti-ballon funnel 18 and drum 12 may be changed. By adjusting knob 28, the gap L between the larger base of anti-ballon funnel 18 and the delivery end 12a of the drum may be minimized as a function of the yarn count. This possibility of adjustment partly deriving from the above-defined dimensional relation between the diameter of the drum and the diameter of the innermost circumference of larger ring 24, allows the balloon forming upstream of the funnel to be reduced or even eliminated even without providing anti-ballon funnel 18 with a cylindrical portion surrounding an ending portion of drum 12.

[0018] An annular support 30 surrounding drum 12 near its delivery end 12a is attached to stationary drum 16 and holds a pair of movable braking members at diametrically opposite positions (FIG. 5). Each braking member consists of an angular sector of a bristle brush (below, brush 34) which is
What is claimed is:
1. A negative yarn feeder, comprising a stationary weft-winding drum from which yarn loops are unwound during a weft insertion, and a weft-braking device for locking the yarn unwinding from the drum at the end of said insertion, wherein said weft-braking device comprises at least one braking member which is arranged by side of the drum near its delivery end and is movable under control of actuator means between a resting position, in which it is spaced from the outer surface of the drum and does not interfere with the unwinding yarn, and an operative position, in which it engages the outer surface of the drum and cooperates with it to brake the yarn.
2. The negative yarn feeder of claim 1, wherein said actuator means consist of a linear actuator provided with an operating rod, to which said braking member is anchored, which is movable in a radial direction with respect to the drum between said resting position and said operative position.
3. The negative yarn feeder of claim 1, wherein said at least one braking member is mounted to a support integral with the feeder and, in said resting position, is received in a respective seat of said support.
4. The negative yarn feeder of claim 3, wherein said support is shaped as a ring surrounding the drum and supports at least two of said braking members spaced at equal angles.
5. The negative yarn feeder of claim 1, wherein said braking member is a bristle brush.
6. The negative yarn feeder of claim 5, wherein said bristle brush is shaped as an angular sector.
7. The negative yarn feeder of claim 1, also comprising a substantially frustoconical anti-balloon funnel, which is coaxially arranged in front of the drum with its larger base facing the delivery end of the drum, and in that the innermost edge of the larger base of the funnel is smaller in diameter than the winding diameter of the drum.
8. The negative yarn feeder of claim 7, wherein said anti-balloon funnel is supported at an axially adjustable position in relation to the drum.
9. The negative yarn feeder of claim 7, wherein said anti-balloon funnel consists of a plurality of equally-spaced rods arranged along the generatrices of a trunk of cone and having one end attached to a smaller ring defining the smaller base of the trunk of cone, and the opposite end attached to the larger ring defining said larger base of the frustum of cone.
10. A weft-braking device installable on a negative yarn feeder provided with a weft-winding drum for locking the yarn unwinding from the drum at the end of an insertion, comprising at least one braking member connectable to the feeder by side of the drum and movable under control of actuator means between a resting position in which it is spaced from the drum and does not interfere with the unwinding yarn, and an operative position in which it engages the outer surface of the drum near its delivery end and cooperates with it to brake the unwinding yarn.

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