

[54] WEFT STORAGE DEVICE

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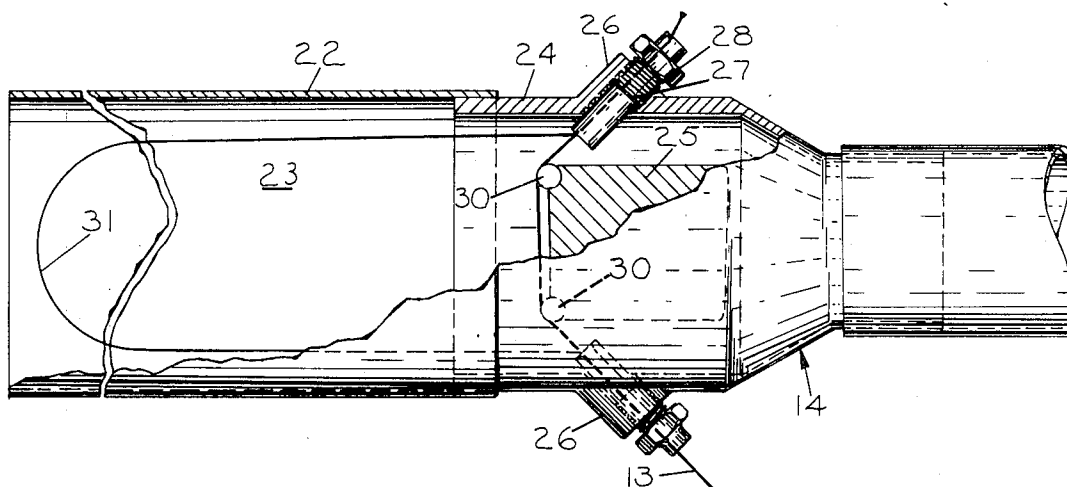
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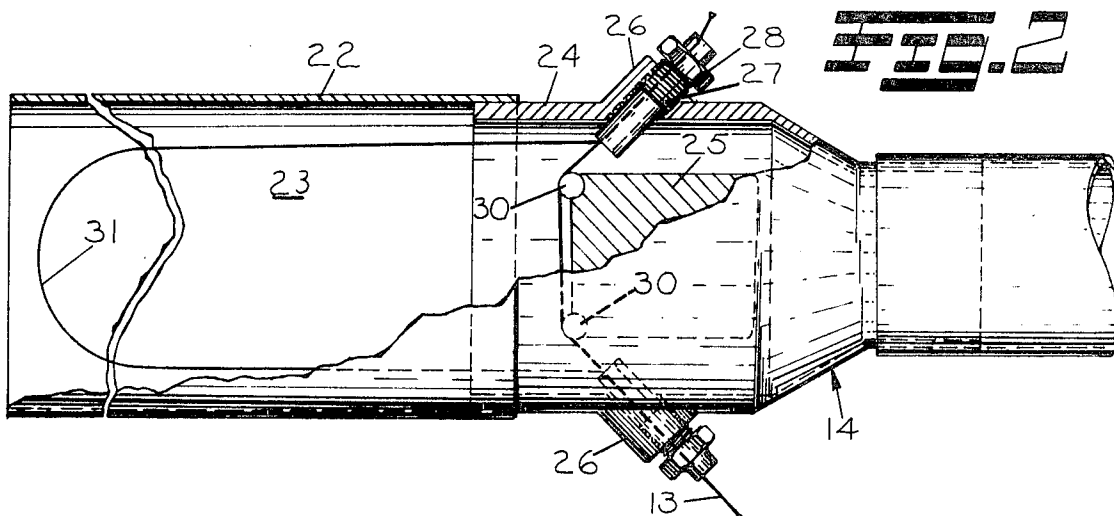
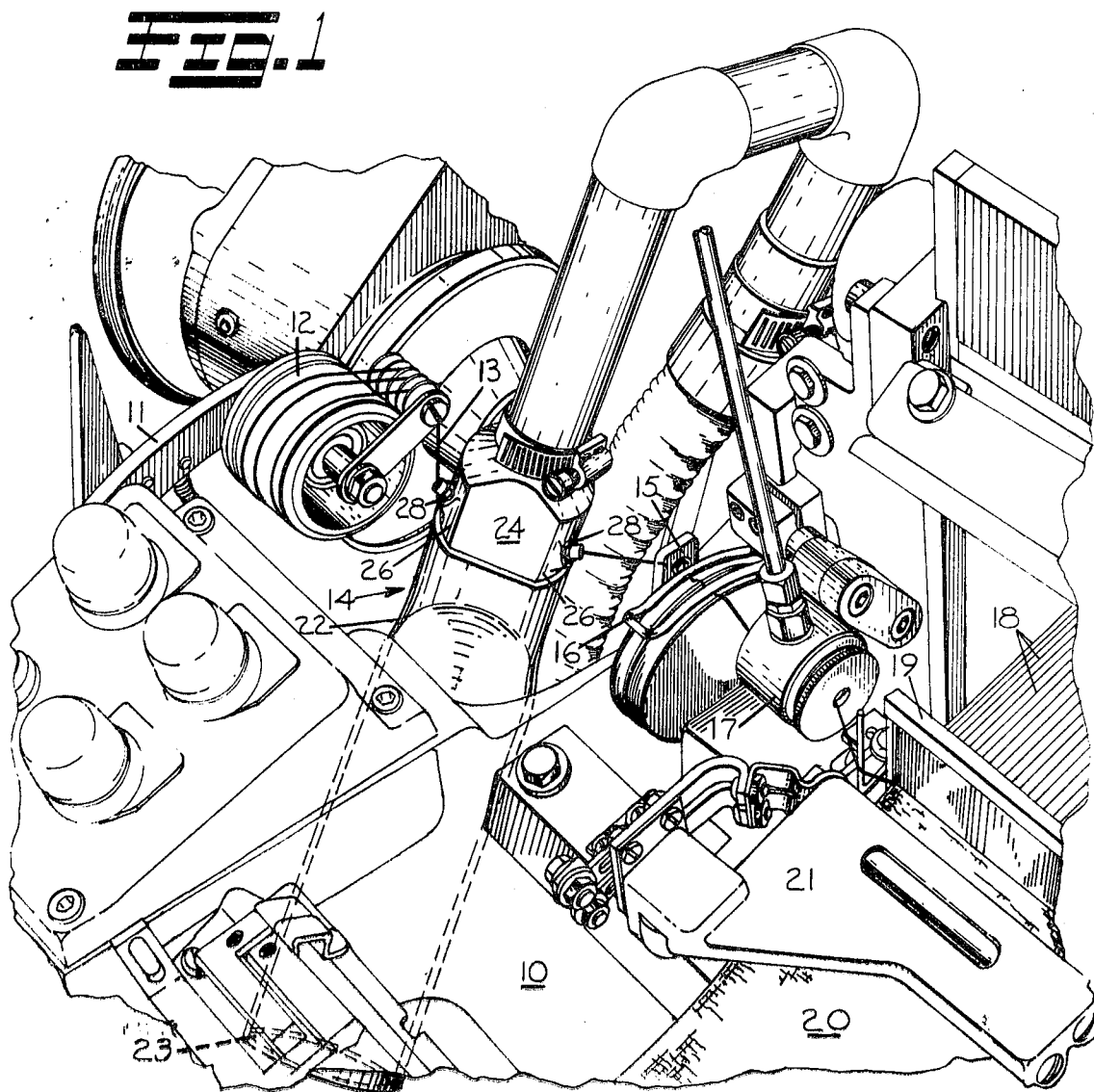
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[57] ABSTRACT

A weft storage device for shuttleless looms having a stationary source of weft supply which includes an elongated air passage device defining a weft chamber through which air is directed to temporarily store a pre-measured length of weft under tension prior to its insertion into a shed of warp threads.

2 Claims, 2 Drawing Figures





WEFT STORAGE DEVICE

BACKGROUND OF THE INVENTION

This invention relates to shuttleless looms wherein weft yarn is drawn from a stationary supply for insertion. More particularly, it pertains to a means for providing a measured uninterrupted supply of weft by sequentially drawing the weft from a measuring device and temporarily storing it in an improved storage device in readiness for presentation to the means for inserting it into a shed formed by warp threads immediately upon completion of the previous pick cycle.

Fluid jet looms to which the present invention is applicable are of two general types and utilize either compressed air or liquid under pressure to insert a premeasured length of weft yarn, drawn from a fixed source, into a shed formed by warp threads.

Such looms include a nozzle device which in timed relation to the weaving cycle releases a jet of air or liquid that engages the free end of a pre-measured length of weft to carry it with the jet through the shed. Additionally it is customary to temporarily and sequentially store a pre-measured length of weft just prior to its insertion into a warp shed as a loop within devices such as a suction tube or the like. To assure a smooth and trouble free withdrawal of the weft from such devices, the loop of weft stored therein must be controlled so as to maintain a separation between the lengths of yarn defining the stored loop.

Known types of weft storage devices which rely on suction of a vacuum source to draw and temporarily store a premeasured length of weft into a tube member or the like do not provide what is considered the desired amount of control on the weft prior to presenting it for insertion into a warp shed.

Spun yarn has a natural tendency, if not held under sufficient tension, to kink and twist upon itself and when an attempt is made to straighten it, the entanglement increases which often results in breakage of the yarn.

With the source of vacuum or suction being spaced from the weft's points of entrance and exit from the tube, the forces at these points are naturally less and are frequently insufficient to prevent kinking and twisting of high twist yarns. Additionally with the known types of storage devices the single suction flow within the storage tube is not, on particular types of high twist yarns, strong enough to maintain a separation in the loop of weft being drawn therein and to prevent its kinking and twisting.

The improved weft storage device according to the present invention has corrected the problem of the weft kinking and twisting upon itself by feeding air into the weft chamber adjacent the weft inlet and exit points and by providing means for maintaining a separation between the loop portion of the weft entering the chamber and that which is being drawn from it.

SUMMARY OF THE INVENTION

The improved weft storage device of the present invention includes a means for defining an elongated air passage having air inlet and exit ends. An air pressure supply line is operatively connected to the device and is provided adjacent this connection with means forming inlet and outlet ports. Each port has a bushing assembled in it for guiding the weft into and from the storage device. Disposed within the elongated air pas-

sage is means creating an individual air passage adjacent in the vicinity of the location where the bushings communicate with the elongated air passage. Each of these individual air passages have a cross-sectional area smaller than that of the elongated air passage. These separate streams of air maintain the loop of weft within the device under the desired amount of tension causing that portion of the loop entering the chamber to be engulfed by one stream and that leaving the chamber to be engulfed by the other stream. By causing the weft to be subjected to separated streams of air directed through the weft chamber, the possibility of said weft becoming kinked or twisted is reduced to a minimum.

It is a general object of the invention to provide an improved weft storage device for fluid jet type shuttleless looms.

A further and more specific object is to provide improved weft storage device having means for maintaining a premeasured loop of weft drawn therein in positive separation and under sufficient tension to prevent kinking and twisting upon itself.

These and other objects of the present invention will become more fully apparent by reference to the appended claims and as the following detailed description proceeds in reference to the figures of drawing wherein:

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective view of a portion of a fluid jet type shuttleless loom showing the weft storage device according to the invention applied thereto; and

FIG. 2 is an elevational view and partially in section of the weft storage device shown in FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. 1 of the drawing wherein only as much of a fluid jet shuttleless loom structure is depicted as is necessary for a complete understanding of the invention, there is shown a portion of the left hand loomside at 10 having a support arm 11 suitably attached thereto on which is carried a weft measuring device in the form of a capstan 12.

The weft yarn is identified by numeral 13 and is drawn from a fixed source of supply through suitable guide elements neither of which are shown and then to the continuously rotating capstan 12 on which several wrappings of said weft 13 are made. From the capstan 12 the weft 13 extends into the weft storage device according to the invention, generally identified by numeral 14 which will be more fully described hereinafter.

When the weft 13 is drawn from the storage device, it passes through a thread guide 15 then beneath an intermittent thread clamping device 16, which is caused to function in timed relation to the weaving cycle. From this clamping device 16 the weft 13 passes through a nozzle 17 by which it is propelled into and through an open shed formed by warp yarns 18.

The usual form of reed 19 serves to beat the inserted weft into the fell to form fabric 20 which is held at its so-called reeded width by temples 21 (one only shown).

Referring now to the weft storage device 14 and particularly to FIG. 2 which shows this device in detail, there is shown a means 22 defining an elongated air passage 23. In the drawings this means 22 is illustrated

as being essentially an elongated tube-like element which, for the greatest proportion of its length, has a generally oval cross-sectional shape but which can obviously utilize other shapes as effectively. At the upper end of tube-like element 22 (as viewed in FIG. 1) is shown a member 24 which is suitably secured to the means 22. This element 24 is mounted at the upper end of means 22 in the configuration shown since the present description concerns the use of positive air pressure to form the yarn loop. Obviously, if negative pressure or vacuum is to be used then the element 24 could as readily be mounted on the opposite end of tube-like element 22.

Member 24 includes an air flow dividing means 25 which is in effect disposed within the elongated air passage 23 due to the fact that member 24 is secured to the end of means 22. On the other hand, it would be possible to construct the yarn storage means as a unitary device so that the means disposed within the elongated air passage would be directly contained within the means 22 rather than as part of a separate member 24. The function of means 25 is to divide the elongated air passage 23 into individual air passages which are of smaller cross-sectional area than is the cross-sectional area of the elongated air passage. By adopting this construction, it is possible to generate air streams of velocities substantially higher than that existing in the main air passage 23 so that yarn entering into passage 23 for storage will be subjected to two individual air streams of comparatively high velocity.

Member 24 includes an integrally formed boss 26 on each side thereof, which bosses have appropriate openings or passages 27 extending therethrough. In this case, the inner surfaces of openings 27 are tapped to provide for threadable engagement with a pair of bushing elements 28. The purpose of bushing elements is to provide a passage extending from the exterior to the interior of the member 24. The inner end of passages 27 are located in the vicinity of the means 25. Passages 27 with the respective bushings 28 form inlet and outlet port means through which the weft yarn 13 can enter and exit from the elongated air passage 23.

As shown in FIG. 2 bushing elements 28 are angularly disposed relative to the direction of the flow of air into the tube-like element 22 and their angular position creates a condition that is effective in drawing air into said element 22 through the bushings which is an obvious advantage in added control of the weft as it enters and leaves the air passage 23.

To assist in a smooth withdrawal of the weft from the tube-like element 22 a pair of weft guide pins 30 (FIG.

2) are provided within member 24 and are disposed so as to be engaged by the weft during its withdrawal.

To summarize the operation, the tube-like element 22 is adapted to successively receive from the capstan 12 predetermined lengths of weft, each of which are suitable for a single pick in the woven material shown at 20. The weft is drawn into the tube-like element 22 in the form of a loop 31 (FIG. 2) and to prevent its kinking and becoming twisted upon itself that portion of said loop extending into said element is caused to remain within one of the air streams formed by the air flow dividing means 25 while that portion extending toward the exit of said element is caused to remain within the other air stream formed by means 25.

The pair of spaced and parallel streams of air caused to flow through the tube-like element are effective in applying the proper amount of tension upon the weft so as to maintain the loop thereof in positive separation while temporarily held within the storage device.

Although the present invention has been described in connection with a preferred embodiment, it is to be understood that modifications and variations may be resorted to without departing from the spirit and scope of the invention as those skilled in the art will readily understand. Such modifications and variations are considered to be within the purview and scope of the invention and the appended claims.

I claim:

1. An improved structure for storing successively predetermined lengths of textile yarn to be inserted into the sheds formed between cooperating warp yarns, said structure comprising:

- a. means defining an elongated air passage having a single source of compressed air directed therein and within which a loop of yarn can be formed and stored for weft insertion into a shed;
- b. means on said elongated air passage defining means forming inlet and outlet ports through which yarn can enter into and exit from said air passage respectively; and
- c. air flow dividing means disposed within said elongated air passage creating a separate air passage in the vicinity of each inlet and outlet port means which is of smaller cross-sectional area than that of said elongated air passage.

2. The improved structure according to claim 1 wherein said inlet and outlet ports are angularly disposed relative to the longitudinal extent of said air passage.

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