

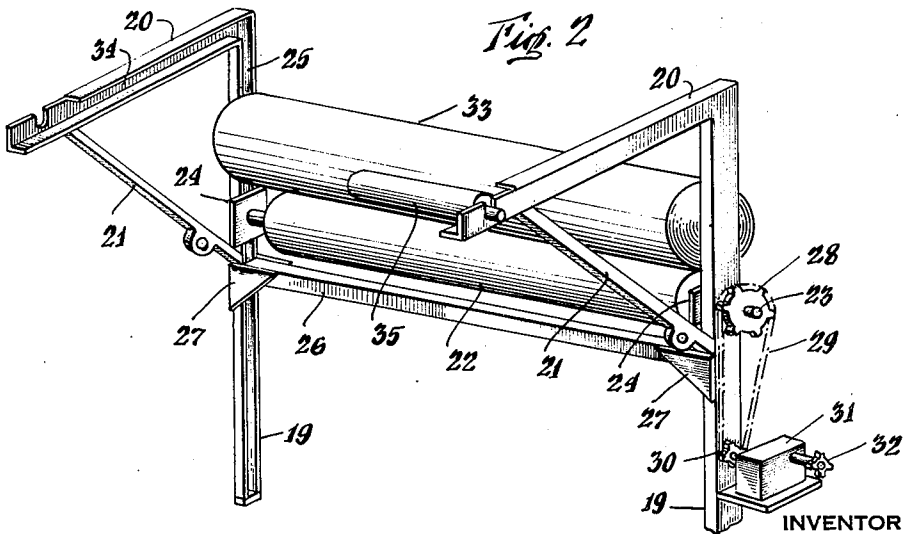
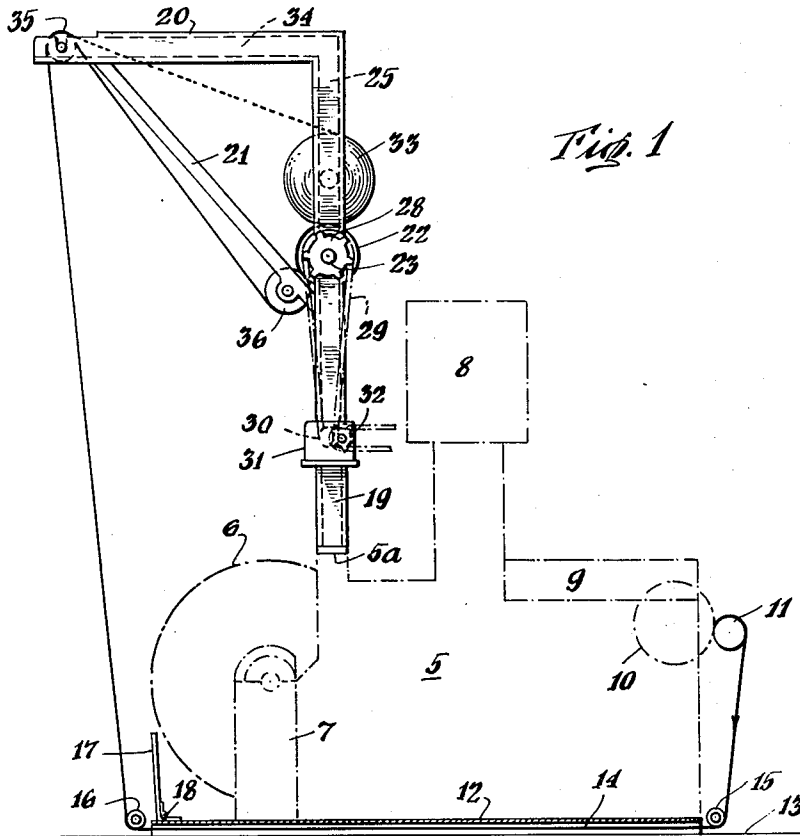
Oct. 29, 1957

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2,811,176

LARGE CLOTH TAKE-UP ROLL FOR LOOMS

Filed Dec. 1. 1955



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1

2

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LARGE CLOTH TAKE-UP ROLL FOR LOOMS

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Application December 1, 1955, Serial No. 550,262

10 Claims. (Cl. 139—308)

This invention relates to improvements in looms for weaving cloth and to other machines used in the manufacture of fabrics other than woven cloth; as, for example, warp knit goods or tricot knit materials.

More particularly, the invention is concerned with providing means in a loom, knitting machine or other apparatus used for the manufacture of cloth or the like, for increasing the amount of cloth that may be rolled up on the so-called cloth roll before it becomes necessary to doff the rolled-up cloth from the loom or other cloth fabricating apparatus.

In conventional looms today the arrangement of essential parts, broadly speaking, starts at the entrance end of the loom with a loaded warp beam from which a multitude of individual warp threads are fed into the loom proper. After coming off the warp beam or beams, as the case may be, the several warp threads pass through harnesses and into a lay where filling threads running transversely are interlaced with the warp threads to form the weave of the cloth being manufactured. After the interlacing of the filling threads with the warp, the woven cloth emerges from the delivery end or back end of the loom and normally, at that point, is passed over a so-called sand roll and through a nip formed by the working surfaces of the sand roll and an adjacent rubber covered guide roll. After passing through this nip, as described, the woven cloth is then wound up on a receiving roll, which is also sometimes referred to in the industry as a package or cloth roll. It is on this receiving or cloth roll that the woven fabric is wound either temporarily or for shipping purposes. The cloth roll ordinarily is driven by frictional engagement with the sand roll. This arrangement is diagrammatically illustrated on page 438 of the American Cotton Handbook, second revised edition, published by Textile Book Publishers, Inc., New York, N. Y., 1949.

As a general rule, then, in conventional loom structures the warp beam is the point at which the weaving operation begins, and the warp beam is situated at the entrance or front end of the loom. At the other end, only a short distance from the fell, is the delivery end of the loom on which are mounted the coating sand roll and receiving roll or cloth roll, which marks the end of the weaving operation.

In the present invention, however, both the warp beam and the cloth roll are at the front of the loom, or its entrance end, not at the back. One reason for this unconventional arrangement is that by putting the cloth roll at the same end of the loom as that on which the warp beam is mounted, a greater amount of cloth may be wound up on the receiving roll before doffing, than is possible with the conventional roll arrangement which, as stated, puts the receiving roll at the delivery end of the loom or other cloth fabricating apparatus.

One purpose and object, therefore, of the present invention is to provide means for increasing the size of the cloth roll, thereby reducing the frequency or number of times that the rolled up woven cloth must be removed

from the weaving apparatus, and increasing the time interval between doffings of the same roll.

Another purpose and object of the present invention is to provide for the weaver a longer period of time within which to inspect the woven cloth as it emerges from the loom prior to being wound up on the receiving roll.

Other purposes and objects will appear hereinafter.

It has heretofore been attempted, as in U. S. Patents Nos. 2,442,127 and 2,644,490, not only to increase the size of the cloth roll before doffing becomes necessary, but also to provide greater opportunity for inspections on the part of weave room operators as the cloth is traveling from the delivery end of the loom, or other cloth fabricating machine, to the receiving roll.

In both of the patents mentioned, indeed, provision is made for a larger receiving roll and a longer traverse of the cloth from the delivery end of the loom to the receiving roll, but these purposes and objects are accomplished in each instance by setting up two separate and distinct assembly units, on two different floors of the weaving mill. More particularly, the receiving roll in both of these references is mounted in an assembly that is located on the floor below the weaving room, and as the cloth passes from the loom it is fed down through a slit or hole in the floor to the receiving apparatus supported on the floor below. Therefore, to inspect the cloth adequately, as these patentees intend, it is necessary to have either the weaver, or supervisor, or other weaving personnel attend the machines on both floors. It may well be that the cloth in both such cases is well inspected, but these prior art arrangements also require additional people to do the inspecting.

In contrast to the questionable value of an improvement which requires the employment of more personnel to do a proper job of inspecting the cloth, according to the present invention substantially the same or even a better result is achieved without extra help and with more convenience. This is achieved by mounting the receiving roll above the warp beam, adjacent and in full view of the weaver's customary position at the entrance end or head of the loom. Thus the present invention accomplishes its purposes and objects by means of an assembly wherein there is no spacing or physical separation between the cloth receiving assembly and the cloth weaving apparatus.

With the above and other objects in view, as will be apparent, this invention consists in the construction, combination, and arrangement of parts, all as hereinafter more fully described, claimed, and illustrated in the accompanying drawings, wherein:

Fig. 1 is a side view of one embodiment of the present invention shown in full lines, with a schematic representation in dot and dash lines of only so much of a conventional loom as is required for a proper understanding of the mounting position and relation between the present receiving roll assembly and the other portions of the loom, the latter being entirely conventional and well-known to the industry;

Fig. 2 is a partial perspective end view of the same embodiment of the invention as that shown in Fig. 1, without illustration of the conventional parts of the loom, but with a representation of appropriate means for rotating or driving the cloth receiving roller.

As previously indicated herein, the present invention finds specific application and embodiment in the handling of cloth which is being woven on a conventional loom, for example, the so-called Draper XD loom, but the same invention may also be employed for winding up a long web of knit goods, such as that made on a warp knitting machine or tricot knitting machine. Generally speaking, the invention contemplates moving the cloth roll from its ordinary position at the delivery end of the loom to a

mounting place above the warp beam at the entrance end of the loom, and, of course, not under the floor of the weaving room, as in both of the patents mentioned above.

To these and other ends, the present invention proposes a loom 5 of conventional size, shape and construction, and comprising a warp beam 6, means 7 for mounting the warp beam 6 at the entrance end of the loom 5, arch means 8 for supporting the usual harnesses, means 9 for interlacing the transverse filling threads with threads of the warp beam 6 to form a woven fabric, and roller means 10, 11 for removing the woven cloth from the delivery end of the loom before it is wound up on the cloth receiving roll.

So much of the loom and its assembly of parts as has been described in the preceding paragraph is, of course, entirely conventional, and, therefore, requires no further description. After the cloth emerges from the lay 9, it passes in the woven state around the friction or sand roller 10 and through the nip formed by the relatively small pressure roll 11 in contact with the working surface of the sander 10. Instead of proceeding from thence to a cloth receiving roll, as in the conventional procedure previously described, according to this invention the cloth is passed down under the loom and under the warp beam, and is then trained over an elevated cloth receiving assembly mounted above the warp beam and just a little bit forward thereof at the entrance portion of the loom. To that end there is provided a tunnel or passageway beneath the loom which may comprise a pair of spaced upper and lower metal plates 12—13, through which the woven cloth 14 is passed on its way from the exit end of the loom back to and under the warp beam in close proximity to the floor of the weaving room. The floor itself may serve as the lower plate but preferably the bottom or under plate 13 rests upon and is supported by the floor (not shown) of the weaving room, while the upper plate 12 of the tunnel for passage of the moving cloth 14 may be fixed by any suitable means, as for example by bolts, to the girts (not shown) of the loom. Idler rollers or other guide means 15 and 16 also may be provided at either or both ends of the tunnel 12—13 for easy passage of the woven cloth 14 therethrough, thus preventing any cutting or abrading action that might weaken the cloth as it travels underneath the loom and warp beam.

As seen in Fig. 1, an access platform 17 hinged at 18 may be thus mounted at the end of the corridor 12—13 through which the woven cloth 14 passes, thereby permitting access whenever necessary to the entrance end of the loom by the weaver or other weaving personnel. It will be understood, of course, that while the weaving operation is going on and the woven cloth 14 is passing through the passage 12—13, there is no necessity for the weaver to have access to the entrance end of the loom 5. During this period, accordingly, the gate or access platform 17 will be in the up position, as shown in Fig. 1, whereby the cloth 14 may pass without interference on its upward travel from a point underneath the loom and the warp beam to a point above both—more specifically to the cloth receiving assembly hereinafter described. On the other hand, when it is desired or becomes necessary for any reason to interrupt the regular passage of the cloth—for examination purposes, for example—then the access platform 17 may be lowered by pivoting the same at its hinge 18 so that the platform 17 then forms a 180° or larger angle with the upper plate 12 of the tunnel 12—13, and in fact, may also rest against the floor (not shown) of the room.

It will be understood also that the means for unwinding the warp threads from the warp beam 6, for weaving the cloth, and passing it through the roller assembly 10—11 are also conventional and well-known, whereby they are not here shown.

The cloth receiving assembly contemplated by the present invention, as seen in both Fig. 1 and Fig. 2, is con-

veniently mounted adjacent and above the loaded warp beam 6. This cloth receiving assembly may comprise a pair of spaced uprights 19 bolted or otherwise secured to the loom 5 as at the brackets 5a which are mountings conventionally provided in a Draper XD loom for use with a second warp beam.

The uprights 19 are or may be made integral with a pair of spaced horizontal top bars 20 which are braced by the diagonal members 21, each upright or vertical member 19 forming an L shape or right angle with its complementary horizontal piece 20, thus defining a skeleton superstructure assembly for supporting the cloth receiving apparatus proper.

To accommodate the cloth receiving members, the uprights 19 and horizontals 20 may be made of channel iron frame, that is with channels or grooves running interiorly of the framework 19—20. Approximately midway of the spaced uprights 19 a driven take-up drum 22 which may be rubber-covered and of a substantial outside diameter may be mounted as by means of its central longitudinal shaft 23 extending from both ends of the take-up drum 22, the ends of the shaft 23 being passed through aligned holes in the channels of the uprights 19. Square mounting blocks 24 fixed to the inside rails 25 of the uprights 19 serve to prevent vertical movement or displacement of the shafts 23 in the channels 25 and vertical movement of the take-up drum 22.

To give added strength to the framework superstructure 19—21, a transverse bracer 26 spanning the distance between the uprights 19 and welded thereto at the corners 27 may be provided.

Means for driving or rotating the driven take-up drum 22 may comprise a sprocket 28 and chain 29 connection to the sprocket 30 of a gear reducer, such, for example, as a Boston 100—1 Gear Reducer 31, including an input 32 for the gear reducer which is taken from a conventional pattern motion on the head of the loom (not shown). Alternative means for driving the take-up drum 22 may be that shown in Figs. 1 and 2 of the previously mentioned Patent No. 2,442,127 comprising the train of gears 29 driven by the motor 30 in said Fig. 2.

The receiving roll or cloth roll 33 of the present invention may be surface driven by frictional engagement of the working surface thereof with the operating surface of the driven take-up drum 22. The opposed ends of the receiving roller 33 may be of such a diameter as to fit slidably within the channels or rails 25 of the uprights 19, whereby, in effect, the cloth roll 33 is made a floating roll, which is to say, as the woven cloth builds up thereon the roller 33 is free to ascend or to move up the vertical channels 25 of both of the uprights 19.

In somewhat similar fashion means are provided for doffing or removing the loaded cloth roll 33 from the receiving assembly 19—25 after it has reached the maximum or desired length. Such means may include the interior channels or cut-away portions 34 of the cross pieces or horizontals 20. A removable guide roll 35 for the moving cloth is also provided to facilitate cloth passage from underneath the warp beam at or near the access platform 17 to a point at the top of the cloth receiving assembly. Of course, it will be understood that before the removal or doffing of the loaded cloth roll 33, it will be necessary first to remove this idler roll 35 from the interior channels 34 of the horizontals 20.

In operation then, after the woven cloth 14 passes horizontally through the tunnel 12—13 beneath the loom 5 and underneath the warp beam 6 mounted in brackets 7, its direction of travel may be made vertical as by passing it over the idler roll 16 and up to the top of the cloth receiving assembly where it is passed over the guide roll 35. Incidentally, if desired, the upper guide roll 35 as well as guide rolls 15, 16 and 36 may be formed in such a way as to facilitate the spreading of the cloth and eliminate wrinkles therein as by giving half or a portion of the rotating surface of the guide rolls 35, 15, 16 and 36

5

a left-hand spiral, and giving a right-hand spiral to the other half or another portion of the guide rolls 35, 15, 16, and 36.

After going around the guide roll 35 the woven cloth 14 may be passed over the upper surface of the cloth receiving roll 33, as seen in broken lines in Fig. 1, and since the working surface of the cloth roll 33 is in frictional contact with the rotating surface of the driven drum 22, the two rollers 22—33 will rotate in unison. As the amount of cloth received on the cloth receiving roll 33 increases and builds up on the tube 33, this increase of woven cloth 14 may be accommodated by reason of the interior channels or free ways 25 of the uprights 19 which afford means for vertical elevation of the core of the tube 33 as the amount of cloth progressively increases thereon. In practice it has been found that with an arrangement such as that described as much as 3500 linear yards of woven cloth may be wound up on the cloth take-up roll 33 before it becomes necessary to doff the roll 33 or remove it from the receiving roll assembly or superstructure 19—25. This is much greater than the yardage obtainable with conventional cloth take-up rolls situated at the delivery end of the loom near the fell and distant from the warp beam.

It will also be recognized as another advantage that according to this invention the distance the cloth travels in full view of the weaving room personnel in back of the loom from the time it emerges from the tunnel 12—13 at or near the floor of the room until it gets to the very top of the cloth receiving roll superstructure 19—20 is so great that the weaving room operators have a much better opportunity and longer time to inspect and examine the woven cloth than they ordinarily have to perform these operations with conventional looms with the cloth receiving roll fixed at the exit end thereof.

Alternate means for winding up the woven cloth 14 on the floating receiving roll 33 are made available by passing the cloth 14 under a second guide roll 36 (which may be spiraled and driven from reducer 31) as shown in full lines in Fig. 1, and from thence through the nip formed by the rolls 22—36, and finally to the cloth receiving roll 33. Whether to pass the woven cloth 14 under the second guide roll 36 before passing it up to and under the cloth roll 33, or whether to pass it directly on to and over the cloth roll 33 without the interposition of its passage through an additional guide roller is a matter of choice, and will, of course, depend upon how easily the goods are creased, the function of the second guide roller 36 being to help to remove any creases that may have been formed in the fabric before it gets to its final take-up on the receiving roll 33.

Thus, according to the invention as described above, there is provided superstructure means at the entrance end of the loom, and mounted above the warp beam, for receiving the woven cloth after it has passed through the exit end of the loom, the construction and arrangement of the cloth receiving assembly being such as to permit much larger rolls to be processed before doffing. At the same time, because of the relatively great distance the woven cloth travels in open width form from underneath the loom to the top of the cloth receiving superstructure, there is afforded thereby an improved opportunity for cloth examination and inspection without the addition of any extra mill hands or weaving personnel.

It will also be understood that although the invention as described herein is suggested for incorporation in a Draper XD loom, it can be utilized with comparable effect by being embodied in looms of other types. By the same token, the invention may be practised in a cloth receiving superstructure adapted for use in combination with cloth fabricating means of other types, as for example, in a tricot knitting machine or a warp knitting machine.

What is claimed is:

1. The combination in a web forming apparatus having an entrance and an exit, of a cloth take-up device mounted

6

above the entrance of the apparatus, comprising a frame superstructure secured to the sides of the apparatus including fixed side rails connected to a transverse bar spanning the apparatus above its entrance, a driven wind-up roll rotatably journaled and fixed against vertical movement at the side rails of the superstructure for moving the cloth from the exit of the apparatus to the cloth take-up device, a tunnel mounted underneath the apparatus between the entrance and exit thereof for protecting the cloth as it moves toward the take-up device, and a floating cloth receiving roll supported and driven by frictional engagement with the wind-up roll, the opposed ends of the cloth receiving roll slidably contacting the side rails of the superstructure to permit increasing build-up of the cloth on the cloth receiving roll while maintaining engagement between the wind-up roll and the receiving roll.

2. The combination in a web forming apparatus having an entrance and an exit, of a cloth take-up device mounted above the entrance of the apparatus, comprising a frame superstructure secured to the sides of the apparatus including fixed side rails, a driven wind-up roll rotatably journaled and fixed against vertical movement at the side rails of the superstructure for moving the cloth from the exit of the apparatus to the cloth take-up device, a tunnel mounted underneath the apparatus between the entrance and exit thereof for protecting the cloth as it moves toward the take-up device, and a floating cloth receiving roll driven by frictional engagement with the wind-up roll, the opposed ends of the cloth receiving roll slidably contacting the side rails of the superstructure to permit increasing build-up of the cloth on the cloth receiving roll while maintaining engagement between the wind-up roll and the receiving roll.

3. The combination in a web forming apparatus having an entrance and an exit, of a cloth take-up device mounted above the entrance of the apparatus, comprising a frame superstructure secured to the sides of the apparatus including fixed side rails connected to a transverse bar spanning the apparatus above its entrance, a take-up drum at the side rails of the superstructure for moving the cloth from the exit of the apparatus to the cloth take-up device, a tunnel mounted underneath the apparatus between the entrance and exit thereof for protecting the cloth as it moves toward the take-up device, and a floating cloth receiving roll driven by frictional engagement with the wind-up roll, the opposed ends of the cloth receiving roll slidably contacting the side rails of the superstructure to permit increasing build-up of the cloth on the cloth receiving roll while maintaining engagement between the wind-up roll and the receiving roll.

4. The combination in a web forming apparatus having an entrance and an exit, of a cloth take-up device mounted above the entrance of the apparatus, comprising a frame superstructure secured to the sides of the apparatus including fixed side rails connected to a transverse bar spanning the apparatus above its entrance, a driven wind-up roll rotatably journaled and fixed against vertical movement at the side rails of the superstructure for moving the cloth from the exit of the apparatus to the cloth take-up device, a passageway mounted underneath the apparatus between the entrance and exit thereof for protecting the cloth as it moves toward the take-up device, and a floating cloth receiving roll driven by frictional engagement with the wind-up roll, the opposed ends of the cloth receiving roll slidably contacting the side rails of the superstructure to permit increasing build-up of the cloth on the cloth receiving roll while maintaining engagement between the wind-up roll and the receiving roll.

5. The combination in a web forming apparatus having an entrance and an exit, of a cloth take-up device mounted above the entrance of the apparatus, comprising a frame superstructure secured to the sides of the apparatus including fixed side rails connected to a transverse bar spanning the apparatus above its entrance, a driven wind-up roll rotatably journaled and fixed against vertical move-

7

ment at the side rails of the superstructure for moving the cloth from the exit of the apparatus to the cloth take-up device, a covered passageway mounted underneath the apparatus between the entrance and exit thereof for protecting the cloth as it moves toward the take-up device, and a floating cloth receiving roll driven by frictional engagement with the wind-up roll, the opposed ends of the cloth receiving roll slidably contacting the side rails of the superstructure to permit increasing build-up of the cloth on the cloth receiving roll while maintaining engagement between the wind-up roll and the receiving roll.

6. The combination in a web forming apparatus having an entrance and an exit, of a cloth take-up device comprising a frame superstructure carried by the apparatus and spanning its entrance, said superstructure including a pair of spaced uprights fixed to the apparatus at either side thereof, a stationary support bar extending transversely of the frame superstructure, a take-up drum rotatably fixed against vertical displacement to the uprights, and a floating cloth receiving roll having opposed ends slidably engaging the uprights constructed and arranged to be supported and driven by the rotatable take-up drum.

7. The combination in a web forming apparatus having an entrance and an exit, of a cloth take-up device comprising a frame superstructure carried by the apparatus and spanning its entrance, said superstructure including a pair of spaced uprights fixed to the apparatus at either side thereof, a stationary support bar extending transversely of the frame superstructure, a take-up drum rotatably fixed against vertical displacement to the uprights, a floating cloth receiving roll having opposed ends slidably engaging the uprights constructed and arranged to be supported and driven by the rotatable take-up drum, and a tunnel mounted underneath the apparatus between the entrance and exit thereof for protecting the cloth as it moves toward the take-up device.

8

8. The combination in a web forming apparatus, of a web receiving superstructure comprising a pair of spaced uprights fixed to the sides of the apparatus at its forward end, a web receiving roll carried by the uprights above the plane of the web forming apparatus, exit means for the formed web at the rear end of the apparatus, and tunnel means underneath the web forming apparatus for conducting the formed web from the exit means at the rear end of the apparatus to the web receiving superstructure at the forward end of the apparatus.

9. The combination in a web forming apparatus, of a web receiving superstructure comprising a pair of spaced uprights fixed to the sides of the apparatus at its forward end, a floating web receiving roll carried by the uprights above the plane of the web forming apparatus, and tunnel means underneath the web forming apparatus for conducting the formed web from the exit means at the rear end of the apparatus to the web receiving superstructure at the forward end of the apparatus.

10. The combination in a web forming apparatus, of a web receiving superstructure mounted above the forward end of the apparatus, a floating web receiving roll carried by the web receiving superstructure above the plane of the web forming apparatus, and tunnel means underneath the web forming apparatus for conducting the formed web from the exit means at the rear of the apparatus to the web receiving superstructure at the forward end of the apparatus.

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