

[54] CLOTH FOLDING MACHINE
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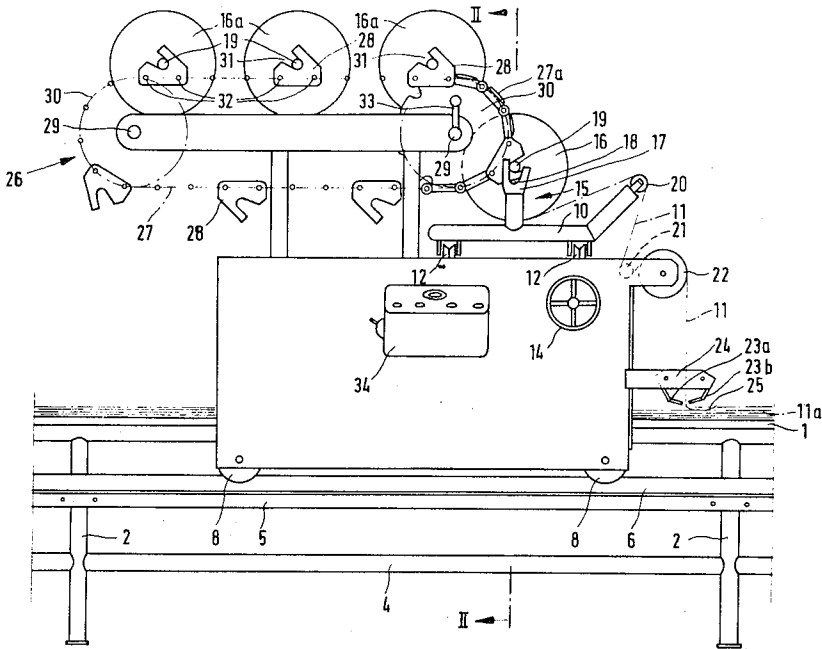
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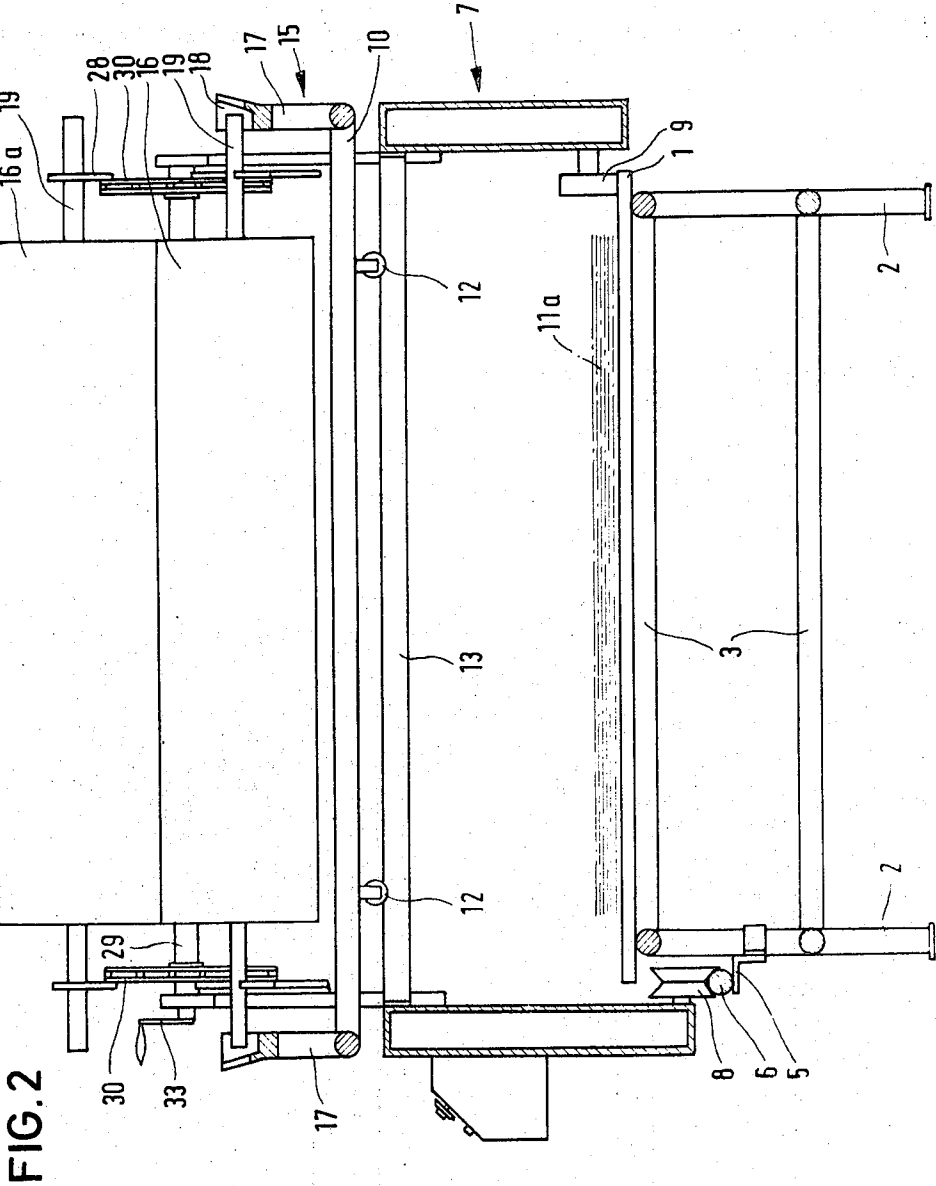
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[57] ABSTRACT
A folding machine, which is displaceable on a table to lay out cloth from a roll to form a stack of folded layers, carries a plurality of further rolls to replace the unwound rolls when they are exhausted. The further rolls are supported in receivers connected to a conveyor, and to transport the further rolls to a carrier device for the roll to be unwound, the conveyor is driven.

9 Claims, 2 Drawing Figures





CLOTH FOLDING MACHINE

BRIEF SUMMARY OF THE INVENTION

The invention relates to a cloth folding machine which is displaceable along the top of a folding table and has a carrier device for a roll of cloth to be unwound.

In course of developments which have taken place recently, it has been desirable to lay out as rapidly as possible considerable cloth plait lengths or a plurality of plait "packages" one after the other on a table. For this purpose, there have been used cloth rolls having a relatively large diameter, and a large initial weight.

In many cases, there are limitations in the machines and the weaving operations which prevent the production of rolls of cloth of large diameter despite the afore-said requirement to lay large plait length or a plurality of plait packages one after the other on a table. In such cases, at the present time, after winding-off a standard cloth roll, i.e. a cloth roll having a relatively small diameter, the folding process must be interrupted and it may become necessary to displace the machine over a distance of many meters to the end of the table in order that a fresh roll of cloth may be inserted. Thus, when large plait lengths are required, the folding process for the production of one or more plait packages must be interrupted several times for very considerable lengths of time.

An object of the invention is to provide a cloth folding machine of the above-mentioned type to lay out large cloth plait lengths or a plurality of plait packages one after the other on a folding table without using cloth rolls of relatively large diameter and without substantial interruption of the folding operation.

To achieve this objective, the invention contemplates a cloth folding machine of the type mentioned at the outset, wherein there is arranged on the folding machine a cloth roll magazine receiving a plurality of supply cloth rolls and a conveyor means for displacing the supply cloth rolls to the carrier device.

Consequently, it becomes possible to provide the cloth roll magazine with a considerable number of supply cloth rolls having conventional diameters of approximately 20 to 30 cm and which, therefore, are relatively light as compared with cloth rolls of large diameter. Then, after the roll of cloth disposed on the carrier device has been wound-off, the conveyor means of the cloth roll magazine is activated in simple manner in such a way that the next supply cloth roll is transferred from the conveyor to the carrier device. This transfer procedure requires only a few seconds and very few manipulations, so that the folding process can be resumed at the interrupted point after an extremely short time. The feeding of the cloth roll magazine with a plurality of cloth rolls requires only an insignificant increase in time as compared with the hitherto known cloth folding machine having only one carrier device for a cloth roll.

A practical embodiment of the invention is characterized in that the conveyor is endless and passes on rotatable wheels and is provided with receiving locations for the supply cloth rolls.

Thus, a further saving of time is achieved, since the conveyor may simply be allowed to rotate until the desired next supply cloth roll has been displaced to the location for transfer to the carrier device.

it is especially expedient if, according to a further feature of the invention, the conveyor consists of two chain or cable strands, or the like, arranged with a spacing somewhat exceeding the width of a roll of cloth and rotating over pairs of wheels having horizontal axes. Each of the strands has oppositely positioned receiving locations for the supply cloth rolls, one of the pairs of wheels being arranged with its axis parallel to the axis of a roll of cloth disposed on the carrier device and closely adjacent the carrier device for transfer of a supply cloth roll thereto.

An especially considerable saving of time can be achieved if, according to a further feature of the invention, the receiving locations for mounting the ends of a rod supporting a cloth roll are constructed as substantially U-shaped plates so secured to the conveyor that their apertures face upwardly, at least during the transfer of a supply cloth roll to the carrier device, the carrier device having grooves which are upwardly open for the mounting of the ends of the cloth holding rod.

A simple construction is achieved if, according to a further feature of the invention, the plates are secured to the pivot pins of the chain strands.

In order that the lower run of the conveyor may be fed with supply cloth rolls, without the latter falling out of the plates, according to a further feature, the plates are so suspended in articulated fashion from the conveyor that their apertures always faces upwardly. In this embodiment, the plates always depend from the chain, so that their apertures are always in a vertical position and open upwardly.

In most cases, it suffices if the conveyor is manually driven to bring the next supply cloth roll to the carrier device, for example by means of a crank.

However, it is also advantageous that the conveyor may be displaceable by means of a power drive. Such drive could, for example, be obtained by the drive motor of the folding machine.

Furthermore, according to the invention, the cloth folding machine is suitable both for manually operated folding machines and also for semi-automatic or automatic folding machines. In the first case, the aforementioned manual drive for displacement of the conveyor is expedient.

It should also be mentioned that, with the aid of the proposed folding machine, not only textile materials but also leather, plastic and the like may be laid or plaited.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a side elevational view of a folding machine on which a cloth roll magazine has been fitted, and FIG. 2 is a section taken along line II—II in FIG. 1.

DETAILED DESCRIPTION

In the drawings, reference numeral 1 designates the table top of a folding table and numeral 2 the supports carrying the table top. Reference numeral 3 designates transverse beams and numeral 4 designates longitudinal beams.

Secured to the supports 2, at a longitudinal side of the table, via an angle member 5, are rails 6 which are round in cross-section and on which the folding machine 7 reciprocally travels by means of wheels 8. The wheels 8 are grooved to correspond to the cross-section of the round travel rails 6.

On the other longitudinal side of the folding table, the folding machine 7 carries non-profiled travel wheels 9 which travel on the table top 1 in a zone near the longitudinal edge of the table top.

The folding machine 7 has a carriage 10 which, in order to permit edge-control of the web of cloth 11 to be laid-out, is displaceable transversely with respect to the direction of travel of the folding machine 7. For this purpose, the carriage 10 is provided with travel rollers or casters 12 mounted on rails 13 on the folding machine 7. The travel rails 13 also have a round profile and the travel rollers 12 are correspondingly profiled. In order to make edge-control possible, a corresponding control and drive device of known type controlled by photocells may be provided on the folding machine 7. The edge-control may, however, also be effected by operation of a hand wheel 14 engaging the carriage 10 or, directly, by manual displacement of the carriage 10.

Mounted on the carriage 10 is a carrier device 15 for a roll of cloth 16 to be wound-off. The carrier device 15 consists of a fork-like bearing 17 arranged at both ends of the carriage and having grooves 18 which are upwardly open to receive the ends of a cloth holding rod 19 pushed through the cloth roll 16 to be unwound.

The cloth web 11 to be wound-off from the roll of cloth 16 first passes on a guide roll 20 on the carriage 10, then on a further guide roll 21 of the folding machine 7 and, finally, on a cloth feed roll 22 which is also attached on the folding machine 7, the guide roll 21 advantageously enlarging the wrapping angle of the cloth web 11 on the cloth feed roll 22. The cloth feed roll 22 may be driven, in known manner, in synchronism with the speed of the folding machine 7.

Secured underneath the cloth feed roll 22, on the folding machine 7, is a folding head 24 extending along the width of the table and consisting of two folding blades 23a and 23b. The two lower, aligned, longitudinal edges of the folding blades 23a, 23b define between them an elongate slot 25 for passage of the cloth web 11 dropping vertically downwardly from the cloth feed roll 22. The "package" of plaited cloth already laid out, for example in zig-zag configuration, on the table top 1 has been designated 11a.

For the vertical travel of the folding head 24 to accommodate the increasing height of the plaited package 11a, the folding head is vertically guided in suitable and known manner (not shown) and is suspended from a chain or the like on the folding machine 7. Vertical travel may be effected manually or automatically.

It should also be mentioned that the folding head 24, in known manner, may include a cutting device (not shown) which is displaceable in its longitudinal direction and by mean of which the plaited cloth webs may be severed from the roll. In this case, the plaiting or laying-out of the plait package is effected in such manner that each plait or layer is disposed one on the other in the direction of travel.

Mounted on the folding machine 7 is a cloth roll magazine 26 receiving a plurality of supply cloth rolls 16a. For feeding the carrier device 15 with cloth rolls, the cloth roll magazine 26 has a conveyor 27 for displacing the supply cloth rolls 16a to the carrier device 15.

The conveyor 27 is adapted for being driven and is provided with receiving means 28 for the cloth rolls 16a.

The conveyor 27 comprises two chain strands 27a and the chain strands 27a are mounted, with a trans-

verse spacing somewhat exceeding the width of a cloth roll 16 or 16a, on wheels 30 arranged in pairs, each on a shaft 29. The chain strands 27a each have oppositely located receiving means 28 for the cloth rolls 16a. As is apparent from FIG. 1, the shafts 29 of the pairs of wheels 30 are parallel to the axis passing through cloth holding rod 19 of the roll of cloth 16 and the rightmost shaft 29 in FIG. 1 is arranged closely adjacent the carrier device 15 for transfer of a supply cloth roll 16a to bearing 17.

For engaging the ends of a cloth holding rod 19 pushed through the supply cloth rolls 16a, the receiving means 28 are designed as substantially U-shaped plates secured to the conveyor 27 at the pivot pins 32 of the chain strands 27a. The U-shaped plates have apertures or notches 31 which open outwardly and the plates are positioned on the conveyor 27 to engage the rods 19 on the upper flight of the conveyor and transport the rods and the cloth rolls 16a thereon around the rightmost wheels 30 along a curved path to deposit a supply cloth roll 16a into the carrier device 15 such that as the conveyor 27 continues to move the ends of rod 19 of the supply cloth roll 16a are automatically and simultaneously mounted in bearings 17 and released from receiving means 28.

For displacing the conveyor 27, a hand crank 33 is mounted on the shaft 29 of the wheels 30 at the right-hand side of FIG. 1.

A switching unit for the drive of the folding machine 7 is diagrammatically illustrated at 34.

After a cloth roll 16 disposed in the carrier device 15 is completely wound-off, the empty cloth holding rod may be manually extracted in simple manner. However, it is also conceivable to effect removal of the empty cloth holding rod by suitable means arranged on the conveyor 27.

The cloth folding machine according to the invention is also suitable for rapid roll replacement (if such should be desired) when, for example, it is required to continue the laying-out of a roll having a predetermined color with a cloth of another color.

What is claimed is:

1. A cloth folding apparatus comprising a folding table, a folding machine supported on said table for longitudinal displacement thereon and including a carrier device for holding a first roll of cloth to be wound-off by the machine in an operative position in the course of travel thereof, said carrier device including bearings having upwardly open grooves for receiving the cloth roll, a cloth roll magazine secured to said machine for movement therewith and including support means for receiving at least one further roll of cloth whereby said further roll travels with the folding machine along said table, said magazine including endless conveyor means on which said support means is mounted, and means for moving the conveyor means to transport the support means therewith, said conveyor means being positioned on said machine relative to said carrier device to transport said support means along a curved path proximate said bearings of the carrier device to deposit said further roll into the grooves in said carrier device after removal of the first said roll of cloth therefrom.

2. A machine as claimed in claim 1 wherein said conveyor means comprises a longitudinally displaceable conveyor.

3. A machine as claimed in claim 2 wherein the cloth rolls have equal widths, said conveyor comprising two

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strands which are transversely spaced over a distance somewhat exceeding the width of a cloth roll, and two pairs of rotatable conveyor wheels supporting said strands and driving the same, said support means being mounted in opposition on the respective chains.

4. A machine as claimed in claim 3 wherein said support means are secured to said strands and are provided with open notches which are oriented to engage the further cloth roll and transport the same over one of the pairs of conveyor wheels for deposit into the grooves in said carrier device.

5. A machine as claimed in claim 4 wherein said one pair of conveyor wheels has an axis parallel to said further cloth roll and arranged closely adjacent the carrier device, said strands traveling along said cruved path as

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they pass on said one pair of conveyor wheels.

6. A machine as claimed in claim 4 wherein said support means comprises U-shaped plates secured to the conveyor, said plates defining said notches.

7. A machine as claimed in claim 6 wherein said strands of the conveyor include links and connecting pivot pins, each of said plates being connected to two adjacent pivot pins.

8. A machine as claimed in claim 6 wherein each strand carries a plurality of said plates so that the conveyor can support and transport a corresponding plurality of said further rolls of cloth.

9. A machine as claimed in claim 1 comprising manual drive means for driving said conveyor means.

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