

[54] **AUTOMATIC MACHINE FOR FORMING ROLLS OF PIECE-FABRICS HAVING A PRE-ESTABLISHED LENGTH AND DISCARDING OF DEFECTIVE FABRIC**

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[51] **Int. Cl.**..... **B65h 19/26**

[58] **Field of Search**..... **242/56 R, 56.6, 58.1, 242/58.4, 59; 26/70; 83/210, 371**

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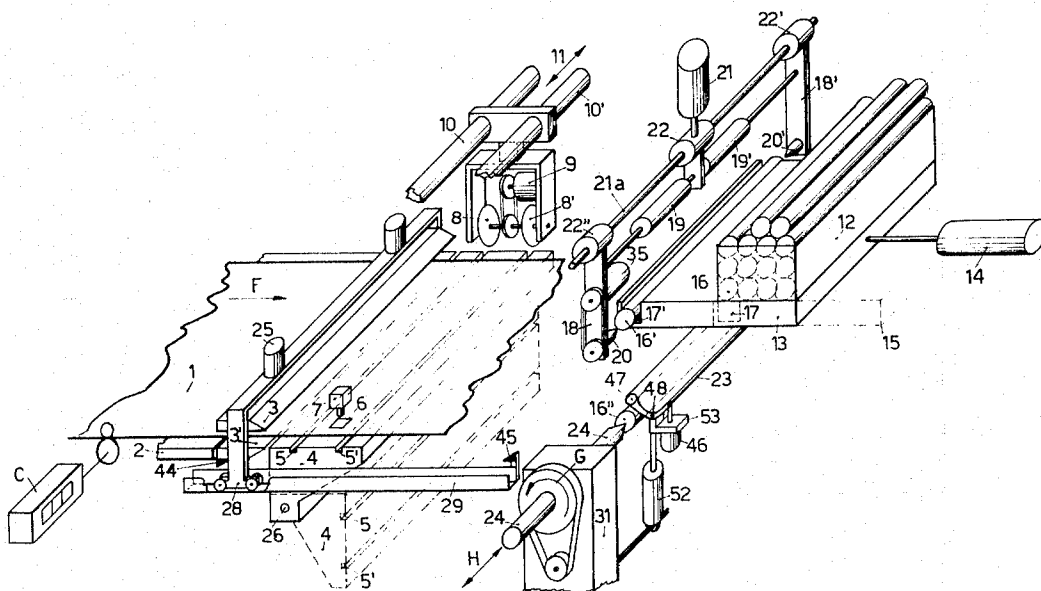
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[57] **ABSTRACT**

A machine for the automatic formation of rolls of piece-fabrics having a pre-established length is provided with a winding up device, a plane on which the fabric is fed, a cutting device actuated by sensor means responsive to signals applied to the fabric or to a counting device, gripper means adapted to seize therebetween the fabric after the cutting operation and carry it to the winding up device, a feeder of cardboard tubes which are the core of the rolls, said feeder comprising means adapted to unwind a sheet of paper from each tube and means for positioning thereafter the tube on the winding up device so that the end of fabric drawn by said gripper means, held between the tube and the unwound sheet of paper, is the origin of a new roll of fabric. An automatic device for discarding the defective fabric is also provided, when the beginning and the end of each defective length of fabric is indicated by previously applied signals. The above mentioned cutting device carries out two cutting operations and the two fabric edges are then joined together by overlapping and the winding up of the roll continued. A device for counting the length of defective fabric is also preferably provided.

18 Claims, 8 Drawing Figures



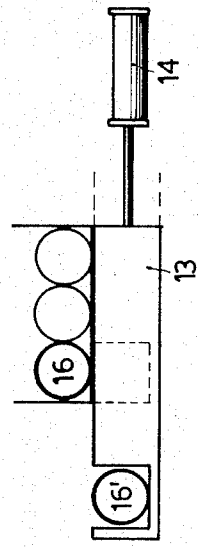


Fig. 3

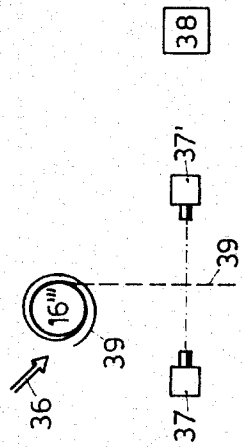
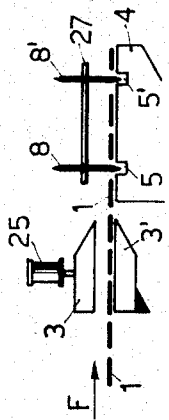
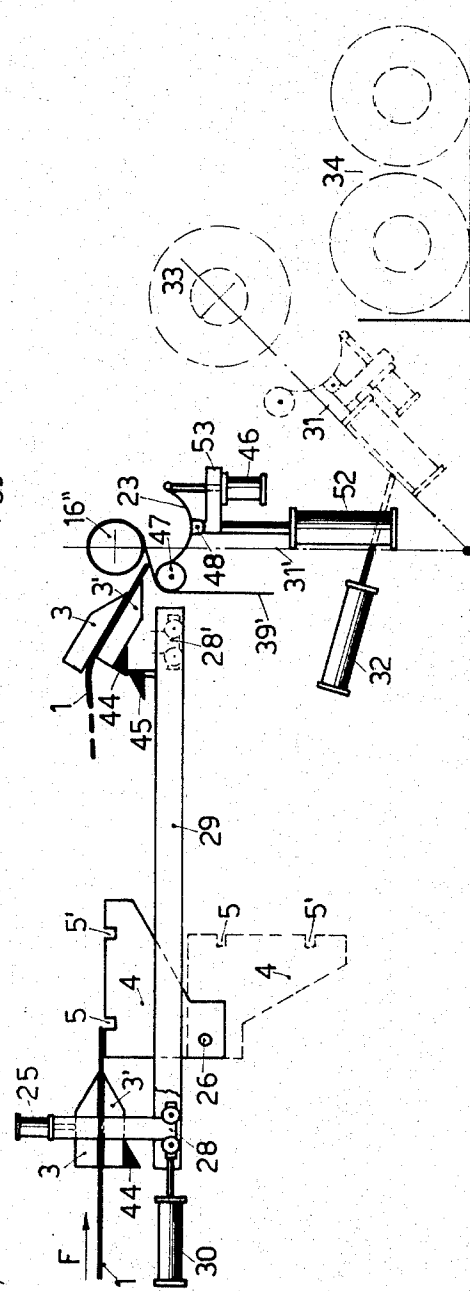


Fig. 4



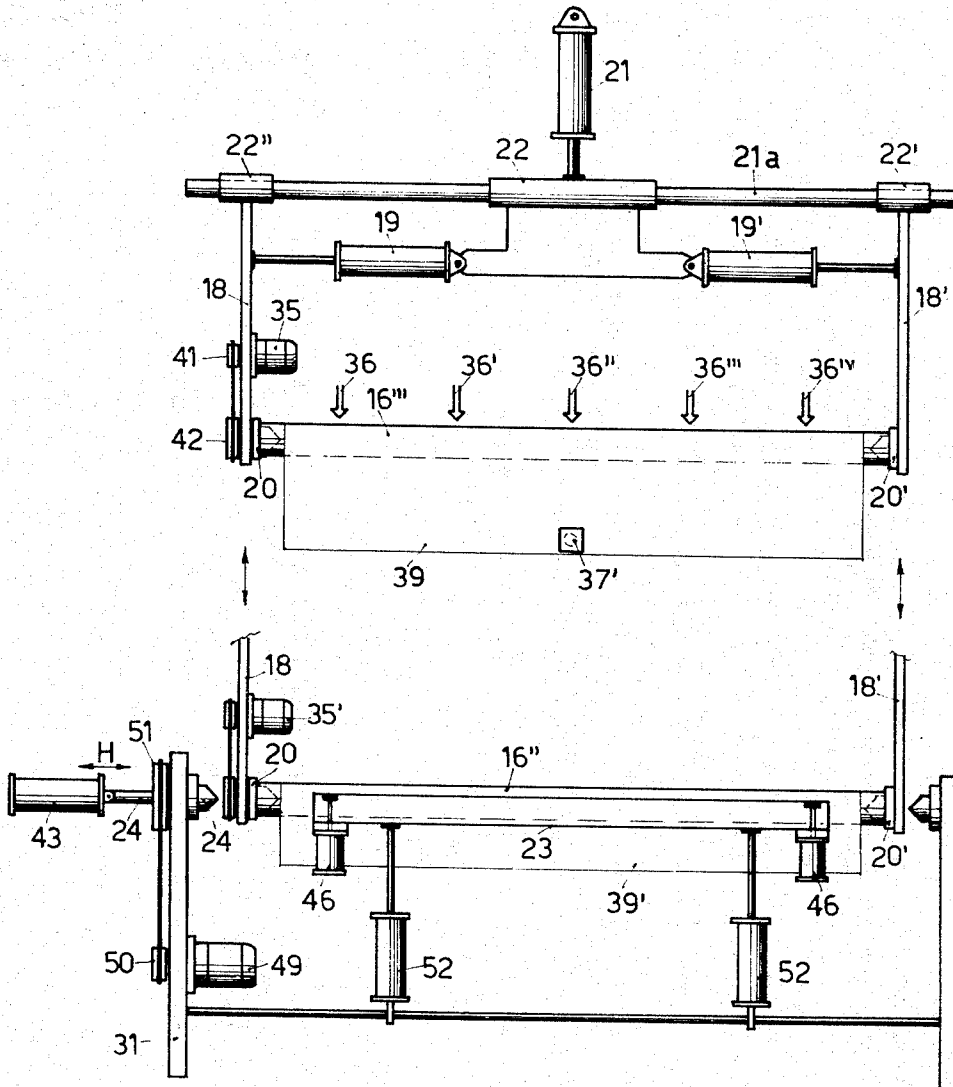


Fig. 5

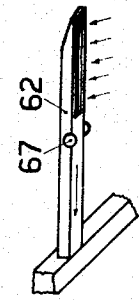


Fig. 8

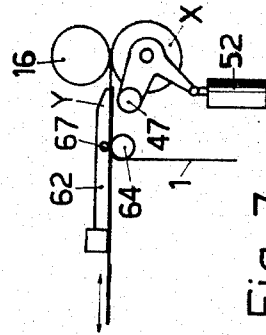


Fig. 7

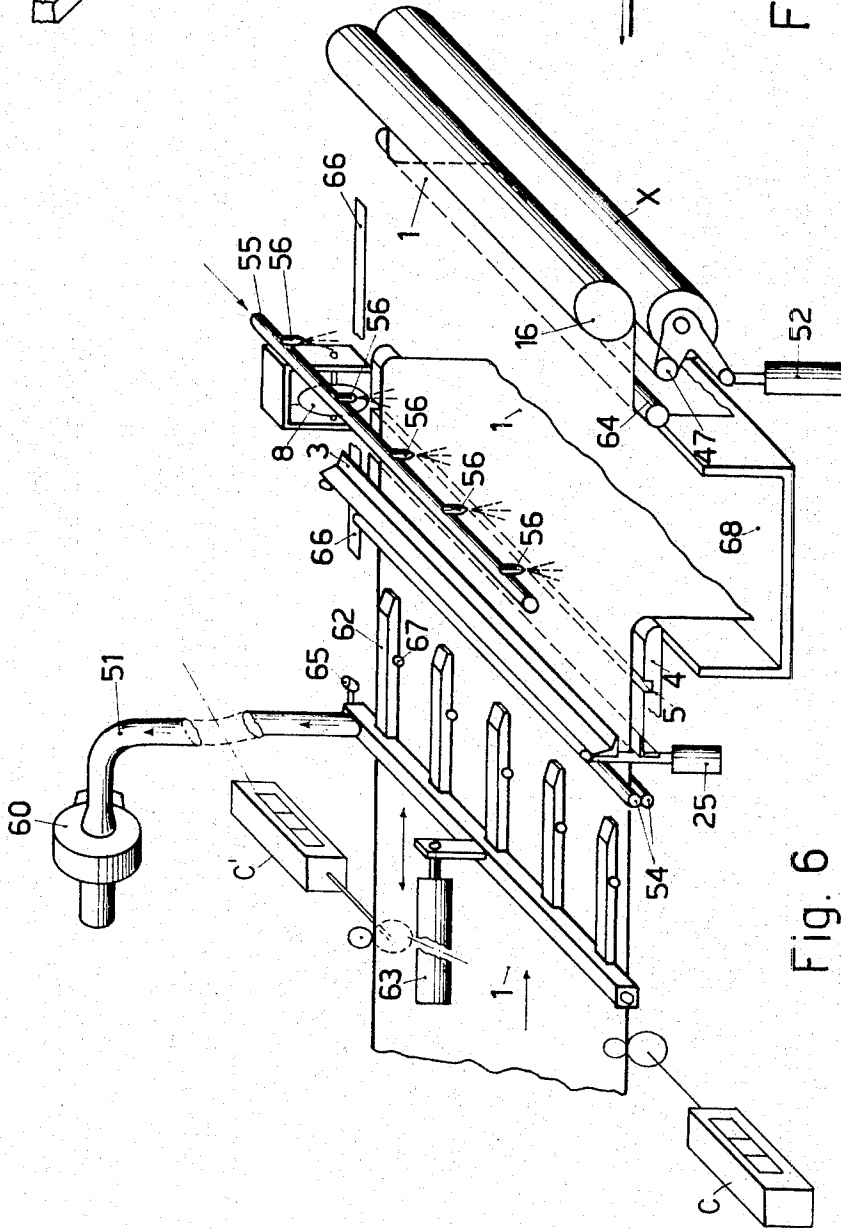


Fig. 6

**AUTOMATIC MACHINE FOR FORMING ROLLS
OF PIECE-FABRICS HAVING A
PRE-ESTABLISHED LENGTH AND DISCARDING
OF DEFECTIVE FABRIC**

BACKGROUND OF THE INVENTION

This invention relates to an automatic machine for forming rolls of piece-fabrics having a pre-established length. Further this invention relates to an improvement of said machine, providing for the automatic discarding of defective pieces of fabrics.

It is known that at present fabrics manufacturers usually carry out the finishing operation on large diameter-rolls permitting a very fast production due to the reduction in standstill times for loading and unloading. Said big rolls often consists of a plurality of pieces coming from the manufacture and may contain e.g., 2,000 m fabrics formed by pieces of 500 m each. Usually however the fabrics are forwarded to the tradesmen in pieces having a much shorter length, e.g. 50 m, so that the big rolls of fabrics coming from the finishing operations must be divided into such shorter pieces to make the 50 m pieces. It will be necessary therefore to feed a winding up machine and to stop it every 50 m, to cut the fabric, to remove the small roll formed and to start the formation of a new one.

Said operation is carried out manually, i.e., a worker, after having established in any known manner that the length is the desired one, causes the machine to stop, cuts the fabric, removes the small roll formed, puts into the machine a new cardboard tube which constitutes the core of the roll whereonto he causes to be wound up another 50 m long piece ready for sale. This sequence of operations obviously involves a considerable waste of time and labour, so that the advantages obtained by effecting the finishing operations on very long pieces of fabrics are considerably reduced.

It is also known that in a roll of fabric there may exist defects due to processing imperfections. These defects are sometimes simply indicated in different ways by signals applied at the beginning and at the end of the defective portion in order to advise the users of the presence of the defect and also to be able to deduct the unutilizable part from the measurement. Often however, in high quality productions, it is preferred to discard the defective part during the winding up stage, after the finishing operation.

SUMMARY OF THE INVENTION

It is an object of this invention, to provide a machine which affords the full automation of the above said working cycle, so that the operation of dividing the big rolls into ready for sale pieces occurs without any manual intervention.

It is another object of this invention to provide this automatic winding up machine with an automatic discarding device of the defective fabric.

The machine according to this invention essentially comprises a pair of grippers which are adapted to stop the fabric in the points where the piece has to be cut and, subsequently, to feed the fabric again; a cutting device for cutting the fabric in order to separate one piece from the other; a feeder of tubes on which the roll has to be formed; an automatic winding up device; and means for discarding the defective fabric.

It is clear that the winding up machine according to this invention no longer involves the standstills due to

discontinued operation for replacing the central tube of the roll to be formed and that the constant presence of an operator carrying out said replacement manually is no longer required.

BRIEF DESCRIPTION OF THE DRAWINGS

Some embodiments of the machine according to the present invention will be reported now by way of non-limiting examples, with reference to the accompanying drawings, wherein:

FIG. 1 shows a schematic perspective view of a first embodiment of the machine according to this invention;

FIG. 2 shows a second embodiment of the machine according to this invention;

FIG. 3 shows a detail of FIG. 1 or FIG. 2;

FIG. 4 shows a schematic side-view of the machine according to FIG. 1 without the tube feeder and illustrating in particular the automatic winding up group;

FIG. 5 shows an end-view taken from the righthand side of FIG. 4;

FIG. 6 represents a perspective view of the same machine in particular with reference to the automatic discarding device of the defective fabric;

FIG. 7 represents a schematic side-view of a detail of FIG. 6 during a given operating moment; and

FIG. 8 represents an enlarged perspective view of a detail of the machine as represented in FIG. 6.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to the drawings there can be seen the fabric 1 coming from the finishing machine and moving forward from the left-hand to the right-hand side along the direction of the arrow F. As said previously, the fabric in question consists of a plurality of big pieces joined together to expedite the finishing operation. Precedingly there had been applied onto the end of each big piece special signaling means 6, which are normally self-sticking phosphorescent pieces of paper existing in trade and capable of exciting a photoelectric cell 7. Of course, said signaling means 6 might also be different, such as e.g. magnetized or in general metal signals, i.e., elements which can be sensed by an electric, electronic or pneumatic sensing element 7. In particular, there might be simply provided holes or pleats on the fabric where one piece is sewn to the other and has, owing to said sewing, a different thickness so that it can be sensed by a photoelectric cell or another electric or mechanical element. However when the signal reaches the relevant sensor 7, the latter sends an impulse to the feeding device of fabric 1, causing it to stop and blocking the fabric in this position for the cutting operation. The length of the piece is measured by already known methods, it is printed onto the fabric and the sensing operation is devised so that after a certain number of meters the machine stops to effect a new cutting, even if there will not be again a signal 6 to actuate the element 7.

With reference to the numerical example reported precedingly, in this case the signaling plates 6 or the equivalent elements are placed every 500 m, i.e. at the point where the big pieces are joined together. Consequently, if only this signal should exist, the winding up machine would stop only every 500 m. Since on the contrary a cutting has to be performed every 50 m, another already known measuring apparatus, e.g., a

counting device by advancement of fabric 1, will be provided to stop the fabric every 50 m, so that, independently from the arrival of the signal 6, the machine will stop at intermediate distances of 50 m, under the control of this second measurer. Actually, while it is easy to arrange a signal every 500 m, in the joining point between the big piece and the other, it would be rather difficult to put a signal 6 every 50 m. It has therefore been preferred to adopt this solution, i.e., only one signal every 500 m, giving them intermediate impulses every 50 m by means of the counting device.

It should be said that what has been explained so far has been reported for the sake of clearness without constituting the object of this invention, since it is already known in prior art. The following description on the contrary will illustrate the new and characteristic parts of the machine according to this invention.

With reference to FIG. 1, when advancing from the left-hand side to the right-hand side in the sense of arrow F, the fabric 1 passes through a pair of open grippers 3 and 3', then over a plane 4 provided with two parallel slots 5 and 5' perpendicular to the advancement sense of the fabric, above which the sensing device 7 is arranged. The cutting disks 8 and 8' can run in these slots, as they are caused to rotate by the motor 9 and driven along the width of the fabric on the supports 10 and 10' by a pneumatic or electric driving means, not shown in the figure. This constitutes the fabric cutting device.

The feeder of empty cardboard tubes, constituting the core of the rolls to be formed includes a magazine of empty tubes 12 with an underlying feeding carriage 13 actuated by a pneumatic piston 14 and provided with a feeding slot 17. When the piston 14 has led the carriage 13 into the position 15, represented in dashed lines in FIG. 1, a tube 16 coming from the container 12 falls into the slot 17. Subsequently, the piston 14, moving towards the lefthand side, brings the carriage to the position represented by a full line in FIG. 1, i.e., with the tube 14 in the position 16' inside the slot situated in 17'.

Above and at the side of the container 12, there is provided a device for picking up the tubes consisting of a pneumatic piston 21 which bears centrally through a support 22 a bar 21a, along which two lever arms 18 and 18' can slide through two supports 22' and 22'' under the action of two pistons 19 and 19'. The lower end of each lever arms 18, 18' bears a conical mandrel 20 and 20' respectively. To pick up the tube 16', the two pistons 19 and 19' cause the two lever arms 18 and 18' to close, so that the conical mandrels 20 and 20' are introduced into the two ends of the tube, while catching it strongly. At that moment, the piston 21 slightly lifts the tube 16' through the supports 22, 22' and 22'' so that the tube feeder 13 can return to its right-hand position 15 under the action of piston 14 without encumbering any more the following operations and while recharging at the same time a new tube 16.

Once the feeder 13 is back in its position 15, the piston 21 will come down, thus bringing the tube 16' into the position 16''. At this moment, the pistons 19 and 19' will cause the two arms 18 and 18' to be removed, thus causing the mandrels to be disengaged from the ends of the tube which will fall into the tray 23 to be then seized again by the conical mandrel 24 of the winding up device. Thereafter, the tray 23 will come

down in order not to interfere with the winding operation. The mandrel indeed, not only has a translatory movement in the longitudinal sense of the tube, as indicated by the arrow H, but also has a rotatory movement in the sense of the arrow G imparted e.g. by a pulley connected to a motor, since besides having to hold the tube, it will also have to effect the winding operation in order to form the desired roll.

FIG. 3 better shows the grippers 3 and 3' opened, while the fabric 1 indicated by a dashed line passes between them. There can be seen also the cutting disks 8 and 8' which, keyed on the shaft 27, enter the slots 5 and 5' respectively, and rotating whirlingly cut the fabric. These cutting disks, as indicated in FIG. 1, after having entered the working plane 4 to cut the fabric come out completely therefrom and are positioned outside of the path of the fabric. FIG. 4 on the contrary shows the grippers 3 and 3' closed which have pressed between them the fabric 1 as a result of the action of piston 25 which has pushed downwards the gripper 3. The control impulse to piston 25 is given by the sensing device 7 or by the above-said means for measuring the length of the roll to be formed.

Once the cutting is effected along the two slots 5 and 5', the part of plane 4 bearing such slots and which is pivotally mounted on the fulcrum 26 rotates, under the action of a not represented pneumatic piston, in order not to hamper the following operations, and is positioned as indicated by the dashed line in FIG. 4. At that moment, the pneumatic piston 30 operates the supporting carriage 28 of the pair of grippers 3 and 3' and by causing it to slide along the guiding rail 29, brings it into the position indicated by 28' drawing with it the grippers 3 and 3' which still press between them the fabric 1. The piece of fabric pressed by the grippers 3 and 3' will have to constitute the beginning of a new roll, the preceding roll being completed and separated by the cutting of the fabric. Once formed, the roll will have to be removed from the winding device, to permit the mandrel 24 to clasp a new tube 16'' onto which the piece of fabric carried by the pair of grippers will have to be wound up.

For this purpose, contemporarily to the forward movement of said grippers, the arm 31 which already occupied the position 33 under the action of the piston 32 causes the finished piece to drop into the carriage 34. This releasing operation occurs since the mandrel 24, actuated by a piston, not represented in the drawings, has moved backward and has left free the roll which falls down owing to its weight. When the lever 31 is in this position, the operation of feeding the new cardboard tube for forming a new roll begins.

The feeding carriage, which is driven by the piston 14 conveys the tube 16 into the position 16', then, the conical mandrels 20 and 20' close under the action of the pistons 19 and 19', they clasp the tube and lift it while the carriage 13 returns to its backward position whereafter they lower it to the position 16'', as explained before.

However, before reaching the position 16'' the downward travel of the tube is stopped in the position 16''' as it is better shown in FIGS. 4 and 5. In said position, a motor 35, through the pulleys 41 and 42, causes the mandrels 20 and 20', and consequently the cardboard tube held by them, to rotate in the opposite sense with respect to the normal winding up sense. Contemporarily, a plurality of nozzles 36, 36', 36'' etc. direct

a blow of compressed air tangentially onto the tube 16'''. Since on these tubes, already known in trade, there is commonly wound up a certain quantity of paper, the combined action with a contrary effect of the rotation imparted by the motor 35 and the air jets of the nozzles 36, causes the paper to be unwound. The piece of paper which is unwound from the tube 16''' falls down until it is sensed by the photoelectric cells 37 and 37' which send to the motor 35 an impulse causing it to stop. There is provided a timer 38 which starts to count the time upon the entering into action of the motor 35. If, after a certain pre-established time length, the photoelectric cells 37 and 37' have not sensed the presence of the lower edge of the paper 39, this means that there is some defect which has prevented the paper from being unwound, so that the timer 38 causes the stopping of the machine on which the intervention of an operator is required, the operator being called, if so devised, by an auxiliary acoustic or luminous alarm signal. This type of safety device is very important in the operation of the machine of this invention.

When the motor 35 stops, controlled by the photoelectric cells 37 and 37', the piston 21 continues its downwards stroke causing the roll with the unwound paper to get down from position 16''' to the position 16''. Contemporarily, the lever 31, pushed back by the piston 32, after having discharged the preceding roll returns to the position 31' and the conical mandrels 20 and 20' of the arms 18 and 18' which stopped the roll in the position 16'' move away under the action of the pistons 19 and 19' allowing the free roll to fall into the underlying tray 23. The purpose of this tray is to retain the cardboard roll and to keep it in the right position before being subsequently anchored.

After the mandrels 20 and 20' have moved away, the piston 21 immediately drives again upwards the bar 21a with the supports 22, 22' and 22'' and thus also the arms 18 and 18' which are lifted leaving clear room for the following operations. As soon as these elements have got upwards, the mandrel 24 actuated by the piston 43 (FIG. 5) moves from the left-hand to the right-hand side and holds the cardboard roll 16'' which in the meantime rested free on the tray 23. The tray 23 will preferably have a concave, in particular semicylindrical shape, to avoid that the tube 16'' can roll away.

Reverting now to FIG. 4, the grippers 3 and 3', pushed by the piston 30, had arrived into the position 28' of their supporting carriage, still keeping tightly between them the piece of fabric with which a new roll will have to begin. The lower gripper 3' is provided with a cam in the form of a sloping plane 44 contrasting in the position 28' a fixed projection 45 having an opposite slope which causes the pair of grippers to stop and rotate. In this position, the fabric 1 is in contact with the roll 16'' while the paper 39' unwound from the roll passes over the cylinder 47 which is integral with the tray 23. At this point, the piston 46 causes the lowering of the edge of the tray situated in front of that on which the cylinder 47 is mounted and, since the tray 23 has its fulcrum in the central point 48, the cylinder 47 is lifted and presses the cardboard roll 16'', so that the fabric 1 is compressed between the cardboard roll and the paper 39'.

At this moment, the grippers 3 and 3' open themselves and return to their initial position. Contemporarily, the motor 49 (FIG. 5) through the pulleys 50 and 51 causes the mandrel 24 to rotate, so that the card-

board tube 16'' starts to rotate driving with it the fabric and the piece of paper and starts to form a new roll. Still at the same time, the piston 52 causes the lowering of the support 53 of the tray 23 to avoid that the roll which is being formed would collide against the latter owing to its growing diameter.

Immediately thereafter, the plane 4 again rotates of 90° upwards and takes again its initial position in front of the grippers 3 and 3' to make possible a further cutting operation of the fabric.

With reference to FIG. 2 a second embodiment of the machine is represented as in FIG. 1, wherein the grippers 3 for carrying the initial piece of fabric of each new roll are caused to move by a lever 28'' instead of the carriage 28 thus simplifying the rotation of the pair of grippers at the end of their travel towards the winding up device. Also the actual winding up device is slightly modified since 24 does not indicate a mandrel provided also with a translatory movement and adapted to hold the cardboard roll for the winding up operation, but simply is the shaft of a roll X on which there rests frictionally driven, the cardboard tube supported by the mandrel 20. There is also provided another roll 64, the function of which shall be better explained later on.

With reference now to FIG. 6 the automatic winding up machine has been represented taking particularly into account the device for discarding automatically the pieces of defective fabric. On the fabric 1, there have been previously applied signals indicating the beginning and the end of each defective piece. Said signals can be sensed by appropriate sensing elements and are e.g., either phosphorescent papers capable of exciting a photoelectric cell situated in a fixed position or magnetic, metallic, etc., elements, which can be detected by any known means, so that, when the defective fabric arrives on or a little before the slot 5 of the advancement plane along which the fabric is cut, the signal detecting element (not shown in the figure) sends an impulse to the fabric feeding device, causing it to stop and blocking the fabric 1 in this position for the cutting operation. The blade 8 of the cutting device, rolling over the slot 5 cuts the fabric, of which the portion pertaining to the piece being wound up falls down by gravity onto a roll 64 parallel to the cylinders X and 47 of the winding up device and situated in an intermediate position between these and the cutting device.

Above the fabric 1, there is provided a series of suction members 62 connected through a flexible pipe 61 to a vacuum source 60. Said members 62 can slide over the fabric 1 through pairs of small rollers 67, under the action of a double-effect cylinder 63. Moreover, there is provided a pair of rollers 54 positioned transversely and on opposite parts with respect to the fabric so as to press it while effecting, if operated, a conveying action on the fabric.

Once the cutting operation is effected at the beginning of the piece of defective material, a specific friction device (not shown in the figure) blocks the winding up device, causing the stopping of the shaft 24 of the roll X, and consequently of the fabric already wound up on the tube 16, the cut-off portion of which, retained by the roll 64, falls vertically along a certain length. Immediately after the cutting, the rollers 54 are operated and cause the defective fabric comprised between them to move forward, feeding it to the underlying container 68 (from the lefthand to the right-hand side in the drawing). To facilitate the forwarding of the

fabric to be discarded, there is provided means suited to push the fabric downwards, into the container 68. This means can consist e.g., of jets of compressed air emitted by a number of nozzles 56 arranged along a conveying pipe 55, but could be made in any other known manner.

The end of defective piece will be detected by the presence of a signal of the fabric passing in front of an element which is sensing to said signal. A new impulse will therefore be given for stopping the fabric 1 and for operating the cutting device. The blade 8 rolls along the slot 5, cuts off the defective fabric which, still pushed by the jets of air coming out from the nozzles 56, is caused to fall completely into the container 68.

At the same time, the cylinder 63 will actuate the advancing of the suction members 62, which, once they are in the position 5, will cause the fabric 1 to move forward, drawing it with them owing to the suction force applied. In their movement, the suction members 62, after having overcome the zone corresponding to the container 68, will bring the fabric into the position indicated in FIG. 7, i.e. with the end Y beyond the roll 64 on which the pairs of small rollers 67 are resting at the end of the travel of the series of suction numbers 62. Contemporarily, the suction in the members 62 stops, since they are disconnected from vacuum source 60. Said connection may e.g., be assured by a normally closed valve having a push-button 65 for controlling the opening thereof, as indicated in FIG. 2, is operated only over a certain portion of the advancement travel of the suction group, e.g., by a contrast element 66 having a pre-established length.

In the position represented in FIG. 7, the end of non-defective fabric brought by the suction members 62 is overlapped along a certain length onto the piece of fabric preceding the cutting of the defective portion. This overlapped portion is comprised between the roll 64 pressed by the small rollers 67 and the point Y corresponding about to the pressure cylinder 47. Once the junction of the two pieces of fabric separated, as said precedingly, by the cutting of the defective portion has been obtained, the friction, which has caused the roll X and consequently the cardboard tube 16 to stop, is released, thus causing the winding up operation to continue and restoring the continuity of the piece wound up onto the cardboard cylinder 16. The two ends of fabric are kept together by the reciprocal friction action effected during the winding up of the total length of the overlapping portion, corresponding to the distance between the roll 64 and the point Y to which it is to be added the length of the extreme piece which hangs vertically by gravity into the container 68. It should be noticed moreover that the position Y wherein the front end of the fabric is left, drawn by the suction members 62, is rather close to the roll already wound up onto the cylinder 16, so that the winding up tension on the piece is soon added to the above said friction strength between the two layers of fabric.

Immediately thereafter, the piston 63 controls the return of the members 62 (without suction) in the starting position represented in FIG. 6. An appropriate measuring device, e.g., a counting device C' driven by advancement of fabric 1 and rendered operative upon sensing of the signal detecting element, had meanwhile measured the length of the discarded piece of defective fabric, which measurement is in any known manner memorized and will be taken into account by counting

device C for recording the length of the fabric and for determining the cutting of the piece at each pre-established length.

It is to be understood that additions and/or modifications to the above described and illustrated embodiments of the machine according to this invention are possible without exceeding the scope thereof as defined by the appended claims. In particular, the details of construction and solutions adopted for the auxiliary devices may be changed. For example, a different method may be used to bring the piece of fabric next to the winding roll without the rotation of the pressing grippers but for example by lowering first the pressure which is integral with the supporting tray of the roll and lifting it thereafter as said precedingly. The controlling cylinders may not only pneumatic, but also hydraulic or oleodynamic or, if so desired, replaced by electromagnetic controlling devices. There will be provided moreover all connections, relays, limit switches, electrovalves for controlling the cylinder position systems, timers, etc., required to ensure coordination and synchronization of the various operating stages.

What I claim is:

1. An automatic machine for forming rolls of piece-fabrics having a pre-established length around tubes provided with sheets of paper wound thereon, which comprises means for pressing the fabric therebetween along the width thereof and for feeding it to a winding up device; means for cutting the fabric transversely; means for feeding the tubes, which are the cores of the rolls to be formed, and adapted to bring each tube first in an intermediate position and subsequently in a winding up position; means for causing each tube to rotate in said intermediate position in a sense opposite to the winding up sense and cooperating with pneumatic means sending tangential jets of compressed air onto said tube in order to partially unwind therefrom the sheet of paper wound up precedingly; and means for winding up the fabric onto said tube and for discharging the complete roll; actuating means being provided for controlling said pressing means and said cutting means, which are responsive to signals applied on the fabric and to a counting device for measuring the length of the fabric.

2. A machine according to claim 1, wherein said means for pressing and feeding the fabric consists of a pair of gripper elements extending over the entire width of the fabric and adapted to be brought close to each other while pressing the fabric between them, and to move forward to the winding up position, while drawing the grasped piece of fabric.

3. A machine according to claim 2, wherein one of said gripper elements is integral with a carriage sliding in a guide parallel to the path of the fabric, under the action of a reciprocating cylinder and the other gripper element is movable with respect to said first gripper element under the action of a cylinder-piston system.

4. A machine according to claim 3, wherein said gripper element which is integral with said carriage has a cam adapted to contact a corresponding fixed projection close to the winding up position, which stops the travel of said pair of grippers and causes the pair of grippers to rotate until their front part is introduced between the tube in the winding up position and an auxiliary tightening means provided on said winding up means.

5. A machine according to claim 2, wherein one of said gripper elements is integral with a lever sliding parallel to the path of the fabric and rotatably mounted around an axis which is parallel to the length of said gripper elements and perpendicular to said path and the other gripper element is slidably mounted on said lever for a reciprocating movement to and from said one gripper element, said gripper element which is integral with said lever having a cam adapted to contact a corresponding fixed projection close to the winding up position, whereby said pair of grippers are rotated in a position close to the winding up position, until their front part is introduced between the tube in the winding up position and an auxiliary tightening means provided on said winding up means.

6. A machine according to claim 2, wherein said cutting means consists at least of one rotating blade mounted onto a carriage provided with a reciprocating transversal movement with respect to the fabric and adapted to move within corresponding pairs of grooves provided on a tiltable cutting plane which is co-planar with the surface determined by said two gripper elements in their pressing position.

7. A machine according to claim 6, wherein said cutting plane is tiltable around a pivot which is external with respect to the above said pair of grippers, whereby when said plane is rotated after the cutting of the fabric and before the forward movement of the grippers, towards the winding up position, clear room is given for the subsequent operations.

8. A machine according to claim 1, wherein said means for feeding the tubes comprises a magazine for the storage of empty tubes, an underlying charging carriage actuated by a cylinder for feeding one tube at each actuation of said carriage to a position where the tube is grasped by hooking elements for being brought into said intermediate position.

9. A machine according to claim 8, wherein said hooking elements comprise two parallel arms having at one end a conical mandrel, said arms being slidably mounted at the other end for movement along a bar under the action of two driving cylinders, said bar being connected to a third cylinder for movement perpendicular with respect to that of the above two arms on the bar.

10. A machine according to claim 9, wherein said means in said intermediate position causes the rotation of the mandrels of said hooking means and comprises a device adapted to sense that said sheet of paper unwound from the tube and fallen by gravity has reached a certain position, causing contemporarily the rotation of the tube to stop and the lowering of said means for hooking the tube to continue.

11. A machine according to claim 1, wherein said winding up means comprises a pair of lever arms provided with conical mandrels one of which at least has a longitudinal translatory movement for introducing itself into the tube in the winding up position and a rotatory movement given by a motor mounted on one of said arms for winding up the fabric, between said pair of arms there being mounted means adapted to support the tube before it is grasped by said pair of mandrels and after it has been left by said hooking means, said pair of arms being inclinable under the action of a driving cylinder until they stand over a container of complete rolls.

12. A machine according to claim 11, wherein said supporting means of the tube comprises an elongated element having a concave supporting surface adapted to receive said tube when it is released by the above said hooking means and provided with a vertical translatory movement under the action of two cylinders integral with said pair of lever arms, which cause said supporting element to be lowered when the tube is grasped by said pair of mandrels of the above said winding up means, and an auxiliary tightening means integral with said elongated element.

13. A machine according to claim 1, wherein said winding up means comprises a pair of lever arms having mounted therebetween a roll, and actuating means for the rotation of said roll which is capable of frictionally driving said tube to be wound up.

14. A machine for forming rolls of piece-fabrics around tubes provided with sheets of paper wound thereon, comprising: means for pressing the fabric therebetween along the width thereof and for feeding it to a winding up device; means for cutting the fabric transversely; means for feeding the tubes, which are the cores of the rolls to be formed, and adapted to bring each tube first in an intermediate position and subsequently in a winding up position; means for causing each tube to rotate in said intermediate position in a sense opposite to the winding up sense and cooperating with pneumatic means sending tangential jets of compressed air onto said tube in order to partially unwind therefrom the sheet of paper wound up precedingly; and means for winding up the fabric onto said tube and for discharging the complete roll; actuating means being provided for controlling said pressing means and said cutting means, which are responsive to signals applied on the fabric and to a counting device for measuring the length of the fabric; means responsive to signals provided on the fabric at the beginning and at the end of each portion of defective fabric, for controlling the stopping of said winding up means and the operation of said cutting means; means for driving the fabric after the first cutting operation at the beginning of the defective portion up to the signal indicating the end of the defective portion and for actuating the second cutting operation; means adapted to co-operate with said driving means for pushing the defective fabric into an underlying container before and during said second cutting operation; suction means sliding longitudinally along the fabric for carrying, after the second cutting operation, the piece of fabric following the defective portion in overlapping relationship with the free end of the fabric already wound up before the first cutting operation; and means for re-starting the winding up operation, once said overlapping is completed.

15. A machine according to claim 14 further comprising a roll element parallel to the shaft of the winding up roll and situated preceding the latter in the fabric feeding forward sense and at the level of the advancement plane of the fabric, said roll element being adapted to retain around it, during the falling into said container, the end of the already wound up fabric after said first cutting operation.

16. A machine according to claim 15 wherein said suction means comprises a plurality of parallel apertured members provided each with a pair of lateral rollers for rolling over the fabric and connected through a valve, controlled by external operating means, to a suction source, means being provided for moving said

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plurality of suction members to a position where said pairs of rollers are caused to correspond with said roll element thus overlapping therebetween the two portions of fabric separated by the two cutting operations, and for bringing said suction members back to the initial position.

17. A machine according to claim 16, wherein said external operating means of the connecting valve with said suction source are responsive to the position of said plurality of suction members during the above said movement, causing the opening of said valve at a position of the suction members close to the front portion of the fabric after said second cutting operation and the

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closing of the valve when said rollers of the suction members are on said roll element, pressing between them and the latter the two pieces of fabric before the backward stroke of the suction members.

18. A machine according to claim 14, further including means for measuring the piece of discarded fabric, comprised between the first and second cutting operation, means adapted to memorize said measurement and to feed this information into said counting means for measuring the length of the wound up piece-fabric, for cutting the fabric at each pre-established length.

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