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(54) **Apparatus and method for winding fabric rolls with or without automatic elimination of fabric scraps and splicing of the pieces forming the roll**

(57) An apparatus and method for winding a fabric web (6) into fabric rolls (A) either with or without an automatic rejection of the defective fabric (6C) and joining of the fabric pieces forming the roll (A), in which, in the fabric (6) feeding path under the winding station (5) are provided a substantially horizontal cutting portion (7) comprising a swinging belt (11), and a following substantially vertical guide portion (8), comprising a vertical belt (17). Under the winding station (5) a swinging arm (21) is moreover provided. The fabric (6) for forming the fabric roll (A) is performed with the fabric (6) in a stretched condition, whereas the cutting for separating the defective portion (6C) pre-wound on the fabric roll (A), after having unwound it from the fabric roll (A), is

carried with the fabric (6) locked between said swinging belt (11) and said swinging arm (21) in a position thereof raised for supporting the tail portion (6B) of the fabric roll (A) during the cutting for separating the tail portion (6B) of the fabric roller and the defective fabric portion. The front edge (6A) of the fabric (6) is guided to the winding station (5) along the vertical guide portion (8) in a sandwich form between said vertical belt (17) and tail portion (6B) of the fabric during its winding on the fabric roll (A). With the winding station (5) a receiving station (10) for temporarily receiving the finished fabric roll (A) is associated. By associating with the winding station (5) a second analogous winding station (36) it is possible to also form retree fabric rolls (B).

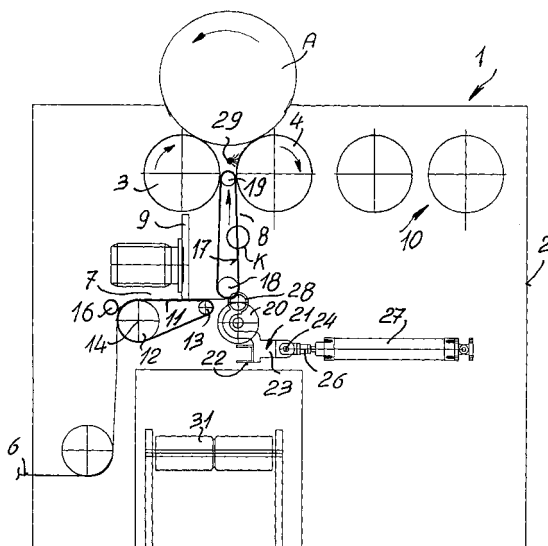


Fig. 1

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Description

Description of the invention

Technical Field

[0001] The present invention relates to an apparatus and method for winding fabrics into rolls either with or without an automatic rejection of the defective fabric and joining of the roll forming pieces according to the preambles of claims 1 and 7.

Background of the invention

[0002] From the Italian patent No. 1,295,752 to the same Applicant, methods and apparatus are already known for winding fabrics into rolls with different possibilities of processing the fabric material, for example for automatically rejecting the defective fabric in lap form, or for recovering the defective fabric on a roll, either with or without an automatic recovering of the roll winding with non defective fabric, with an automatic recovering on overlapping fabric portions, as well as with a packaging of the fabric roll by a synthetic material film, said winding apparatus having a modular construction. The apparatus embodiments disclosed therein have a common characteristic of including a winding station followed by the operating modules for carrying out the required operating steps. In the winding apparatus shown in figure 1, a packaging station is provided downstream of the winding station, in which packaging station, the finished fabric roll is conveyed to be packaged by a packaging film material. The fabric material for separating a finished fabric roll from the fabric being supplied is performed as the finished fabric roll is arranged in the packaging station, said fabric being stretched between the winding station and the packaging station. The packaging film material is also cut in a stretched condition between a pair of film feeding rollers and the film material already wound on the fabric roll. Both the fabric and film material are cut by a cutter which is transversely displaced above the fabric roll transfer plane from the winding station to the packaging station.

[0003] A portion of the path from the winding station to the packaging station is constituted by an endless cross belt which is entrained between an entrainment or driving roller and a transmission roller and adapted to swing between a top position for forming the fabric unwinding path and a downward swung position for allowing the cutter to freely pass therethrough for cutting either the fabric material or the packaging film. The fabric material and packaging film can be cut through by using a single cutter.

[0004] According to a modified embodiment of the winding apparatus shown in figure 2 of the above mentioned Italian patent No. 1,295,752, in order to carry out an automatic rejection of the lap-form defective fabric, a bottom swinging arm having a cut guide for the cutter

blade cooperates with the cross belt. Thus, by this arrangement it is possible, after having unwound and caused the defective fabric to fall by gravity, to perform at first a locking of the defective fabric between said swinging arm at a (substantially) raised position thereof in the plane connecting the winding and packaging stations, and the underlying swinging cross belt raised from the bottom so as to "pinch" or lock the fabric to be cut between said swinging cross belt and said guide arm of said cutter. Thus, the fabric is properly cut in a stretched condition thereof. Also with such an arrangement, the winding apparatus requires a single cutter instead of two, as in prior like apparatus, and allows to make fabric rolls without defective fabric portions.

[0005] In actual practice, the winding apparatus disclosed in the above mentioned Italian patent 1,295,752 efficiently solve their jobs with a safe and reliable operation.

[0006] However, it would be desirable in this connection to solve the same jobs or aims with winding apparatus of simpler construction, less expensive and having a larger yield.

[0007] Actually, the inventor has found that in prior winding apparatus:

a) The time necessary for displacing the fabric rolls from the winding station to the cutting station for carrying out the fabric material, packaging film or for rejecting the defective fabric practically constitutes a "dead time" which, if reduced or eliminated, would correspondingly increase the apparatus yield.

b) The made fabric rolls have an uneven hardness, and in the fabric rolls in which the fabric material is joined by an overlapping joining method, aligning defects between a fabric piece and a following fabric piece can occur because of an unguided roll displacement. This would involve offsets of following fabric pieces, with a consequent difficulty in processing the fabric pieces in cloth making industries, for which waste of fabric even small would be objectable, for example of the order of 1 cm, since such a fabric waste would involve great economic losses, in particular for high cost and quality fabric materials.

c) The requirement of displacing the fabric roll from the winding station to the cutting station also involves a comparatively high requirement in driving and adjusting apparatus, and an offset, even of small value, would involve high displacements of the fabric roll in the cross direction.

d) The provision of a winding station and at least a cutting station, with the related driving and adjusting devices, requires a comparatively large size.

e) The carrying out, by an operator, of retree fabric rolls, i.e. including defective fends having a length of non defective fabric, for example of about 3 m, and which accordingly can be sold at a reduced cost, involves different dead times and an excessive

winding of non defective material.

[0008] Accordingly, the aim of the present invention is to provide an apparatus and method for winding fabrics into rolls either with or without an automatic rejection of the defective fabric and joining of the roll forming pieces adapted to

- overcome the drawbacks of the prior art,
- allow fabric rolls of even hardness and an accurate aligning of the fabric piece to be formed,
- increase the apparatus yield,
- simplify the construction of said apparatus,
- reduce the number of the components and making cost, and
- drastically reduce the apparatus size.

[0009] The aim of the invention also encompasses to make the inventive apparatus in a modular form for also providing retree fabric rolls.

Summary of the invention

[0010] According to the present invention, the above mentioned aim is achieved by an apparatus and method for winding fabrics into rolls having respectively the characteristics of claims 1 and 7.

[0011] An apparatus allowing to form retree fabric rolls has the characteristics defined in claim 10.

[0012] Further advantageous development are shown in the dependent claims.

[0013] The method and apparatus for winding fabrics into rolls according to the invention provide a lot of important advantages.

[0014] At first, the apparatus yield is greatly increased, since are practically eliminated the dead times for displacing the fabric rolls from the winding station to an adjoining station, since all the operations to be performed on the fabric roll to form it are carried out in the same winding station. Thus, by using the winding station for also performing other fabric processing operations, the above mentioned alignment defects of the different fabric pieces wound on a same fabric roll are eliminated. The fabric rolls made in a same station also have an even hardness, thereby facilitating the processing of fabric pieces in confectioning industries, while eliminating prior material waste due to a formation of folds, alignment defects between following fabric pieces on the same fabric roll and so on.

[0015] The number of guide and drive device, as well as of fabric and roll adjusting devices is practically reduced to a half and moreover are also reduced the making costs. Furthermore, the apparatus size is practically reduced to a half and, moreover, the apparatus can be easily coupled to further processing machines, for example packaging, weighing and so on machines.

[0016] Since the winding apparatus operation is greatly simplified, the software required for performing

the fabric processing steps is correspondingly simplified.

[0017] By providing a modular construction of the apparatus according to the invention, by including adjoining to the winding station a second like winding station, it is possible to wind in this second winding station retree fabric rolls, said two winding stations being preferably made with a modular construction, or in a like manner. Thus, also the retree fabric rolls will have the required hardness evenness, like that of the good fabric rolls.

Brief description of the drawings

[0018] The above mentioned and further advantages, details and characteristics of the method and apparatus for winding fabrics into rolls either with or without an automatic rejection of the defective fabric and joining of the roll, and with an optional making of retree fabric rolls, will become more apparent hereinafter from the following disclosure of a winding apparatus according to the invention, which is illustrated in the accompanying drawings, with reference to the parts thereof necessary for understanding the invention.

[0019] In particular, in said drawings, which are respectively schematic middle longitudinal cross sectional views:

Figure 1 shows the winding apparatus according to the present invention in an operating step of winding the fabric to form a fabric roll;

Figures 2 and 3 respectively show the winding apparatus during a fabric cutting step and after having performed the fabric cutting step;

Figures 4 and 5 respectively show the operating step for raising the swinging belt to cause the feeding fabric to advance and an upward entraining step for entraining said fabric and forming a new fabric roll;

Figure 6 shows the winding apparatus performing an unwinding step for unwinding a portion of defective fabric in a method for winding fabric rolls without defective fabric portions;

Figure 7 shows a view of the winding apparatus during an operating step thereof for cutting and removing a defective fabric portion;

Figure 8 shows the winding apparatus in the fabric roll joining step for providing a fabric roll without defective portions, where:

Figures 1A - 8A show, on an enlarged scale, the respective details K of figures 1 - 8, and Figures 9 and 10 show two operating steps for sandwich inserting an end portion of the fabric to be wound into a pending tail portion of the fabric roll being formed,

Figures 11 - 16 respectively show a middle longitudinal cross-section view of an apparatus for automatically winding retree fabric rolls respec-

tively in operating steps thereof for performing a normal winding in figure 11, winding cylinder rejection in figure 12, winding cylinder recovery in figure 13, sleeve rejection in figure 14, central cylinder recovery or second winding station recovery in figure 15 for retree fabric rolls, central cylinder winding in figure 16.

Detailed description of the preferred embodiments

[0020] In the drawing figures, like parts are indicated by like reference numbers, the rotary or movement directions of the movable parts of the winding apparatus being indicated by arrows and the formed fabric rolls being indicated by the letter A.

[0021] Of the winding apparatus according to the invention, only the portions necessary for understanding the invention have been shown.

[0022] From the drawings have been omitted several driving, adjusting and measuring components, since they are of a per se known type and can be freely chosen by one skilled in the art.

[0023] The winding apparatus according to the invention has been generally indicated by the reference number 1 and comprises, in a per se known manner, a supporting framework 2 in which is housed a pair of winding rollers 3 and 4 forming a winding station 5, the roller 3 being idly supported and the roller 4 being driven by a driving motor, not shown, and can be driven in both rotary directions. The feeding fabric 6, formed by seamed fabric pieces, supplied or fed one after the other, is fed from the bottom to the winding station 5 along a feeding path which, according to the invention, comprises a preferably substantially horizontal cutting portion 7, and a following preferably substantially vertical upward directed transport portion, indicated by the reference number 8 and leading to a region between a pair of winding rollers 3 and 4, adjoining the driven roller 4.

[0024] According to the invention the fabric web 6 is cut through under the winding rollers 3, 4 by a cutter 9 which is supported so as to be displaced crosswise the fabric 6 above the mentioned cutting portion 7.

[0025] According to the invention, in the cutting portion 7, the fabric 6 is supported by a swinging endless belt 11, entrained between a driven roller 12 and an idle roller 13, said belt 11 substantially extending through the overall width of the apparatus and can be swingably driven about the axis 14 of the driven roller 12, between a top position (figure 1) in which the fabric 6 is fed, and a lowered position (figures 2 and 3). The endless belt 11 is preferably constituted in the form of sectors, as taught in the Italian patent 1,295,752 the contents of which are herein included by reference. Preferably, a locating rollers 16 for locating the fabric 11 on the driven roller 12 is moreover provided.

[0026] The guided transport portion 8 comprises, in the shown exemplary embodiment, an endless belt 17 entrained between two rollers 18, 19, said roller 18 being

driven by a motor and said roller 19 being arranged between the pair of winding rollers 3, 4. The reference number 20 shows a further roller cooperating with the roller 18 for properly directing the fabric material 6 about the roller 18.

[0027] As is shown in figures 1 to 5, the roller 12 of the swinging belt 11 and the roller 18 of the guided transport portion 8 form in the same time transmission rollers defining the fabric cutting portion 7.

[0028] In order to use the winding station 5, to also perform the fabric roll winding operations both without and with an automatic rejection of the defective fabric, according to the invention, with said swinging belt 11 cooperates a cutting guide swinging arm 21, having a guide section member 22. In the shown embodiment, the swinging arm 21 is a contoured arm and is pivoted at one end 24 thereof on a piston stem 26 of a cylinder/piston unit 27 and, at the other end portion 28 thereof it is pivoted to the apparatus framework. Accordingly, as the cylinder/piston 27 unit is driven, the guide section member 22 is displaced from a rest bottom position (figure 1) to an active top position (figure 7), in which the cutting operation for rejecting the defective fabric can be carried out, after having preliminarily lowered the swinging belt 11 and after having successively raised it while pinching or locking the fabric, as shown in figure 7 and as it will be disclosed hereinafter with respect to the disclosure of the winding process performed by the subject winding apparatus.

[0029] According to the invention, the swinging belt 11 and the cutting guide swinging arm 21 form pinching or locking means for pinching or locking the fabric.

[0030] In figure 1, the reference number 29 shows a pneumatic means for pneumatically adjoining the fabric 6 to the driver roller 4, for example a plurality of nozzles arranged on a tube parallel to the winding roller 4 for ejecting a plurality of air jets adapted to urge the fabric 6 against the winding roller 4 during set fabric processing steps, as it will be shown hereinafter.

[0031] As shown in figures 9 and 10, said means or tube 29 for pneumatically adjoining the fabric 6 to the driven roller 4 is advantageously housed in a hollow construction 40, which has a concave top side 41.

[0032] The reference number 31 finally shows a conveyor for receiving and removing the defective fabric portions 6C cut from the fabric material.

[0033] The winding starting step for winding the roll on a core 30 (figure 5) has not been shown, since this operation can be carried out by any prior method, or it can be chosen at will.

[0034] The winding method for forming fabric rolls without an automatic rejection of the defective fabric according to the invention is carried out as follows:

[0035] During the winding step of the fabric roll A (figure 1), the fed fabric 6 is driven through the feeding path shown in figure 1, i.e. comprising the cutting portion 8 and the vertical transport portion 7 outside the endless belt 17.

[0036] As the desired fabric roll A length has been achieved, the feeding of the fabric 6 is stopped and the swinging belt 11 is swingably displaced to the bottom position, figure 2, thereby the fabric 6 can be cut by the cutter 9, the fabric 6 being in a stretched condition. After having cut the fabric, are thereby formed a front edge 6A of the fed fabric 6 and a tail portion 6B of the fabric roll A, the edge 6A and tail portion 6B, shown by a thicker line, hanging by gravity, figures 3 and 4.

[0037] The fabric roll A, as separated by the continuous fabric web 6, can be driven, in a per se known manner, to the adjoining middle rest station 10 (for example for performing a manual finishing of the fabric roll A or for packaging it) which station 10 can also be arranged in a discrete or separated apparatus, not specifically shown, or, depending on requirements, it can also be built-in in the winding apparatus 1 according to the invention, as shown in the figures.

[0038] As the fabric roll A is driven to the station 10, the winding station 5 will be immediately ready for winding a novel fabric roll A and, more precisely, in the following automatic manner, starting from the condition shown in figure 3. The belt 11 is at first raised, figure 4, and then the fabric 6 is fed so as to cause its front edge 6A to be introduced into the gap 15 formed between the hanging tail 6B and the raising portion of the vertical belt 17. The fabric roll A in the station 10 is thus counter-clockwise driven for winding the tail 6B onto the roll. This will involve an upward forced entrainment, like a sandwich, of the edge 6A along the portion 8, as shown by the detail K in figure 5A.

[0039] At the outlet from the vertical guide portion 17, the tail portion 6B will be further wound on the fabric roll A in the station 10, whereas the front edge 6A of the fabric 6 will be available for winding on a core 30 from immediately forming a novel roll A in the winding station 5.

[0040] In the method for forming fabric rolls A with rejection of the defective fabric portions 6C, the provided operating steps, which are partially equal to the above disclosed operating steps will be as follows.

[0041] If, during the winding of the fabric roll A in the winding station 5 is detected, in a per se known manner, the presence of a defective fabric portion 6C, then said defective fabric portion 6C will be at first wound on the fabric roll A (figure 1) and then the fabric 6 will be cut through, as above disclosed with respect to the winding method for winding without waste the defective fabric. After having performed the cutting operation, the fabric roll A is turned in a turning direction opposite to the winding direction, thereby causing an unwinding and gravity falling of the defective fabric portion 6C, in addition to a tail portion 6B, as it is schematically shown in figure 6, on the web 31 being unloaded. Then, the fabric roll A is stopped, and the cylinder/piston 27 is driven thereby causing the piston stem 26 to be ejected and causing said swinging arm 21 for guiding and pinching the fabric to be upward arranged, as shown in figure 7. After hav-

ing raised the swinging arm 21, is likewise upward swingably driven the swinging belt 11, thereby pressing the defective fabric 6C against the swinging arm 21, to pinch or lock the fabric material to allow to perform a separating cut between the defective fabric portion 6C and the fabric tail 6B with the fabric material in a stretched condition. After having cut the fabric, the swinging belt 11 and then the swinging arm 21 are swingably lowered, thereby clearing the defective fabric portion 6C which will fall onto the removing or discharging belt 31.

[0042] If the fabric roll A after having removed the defective fabric portion 6C has achieved the desired meter amount, then the fabric roll is unloaded as it has been above disclosed. If, on the contrary, the fabric roll has not achieved the desired meter amount, then, a so-called joining operation for joining the novel fabric 6 to the fabric roll A will be performed, by overlapping the fabric edge 6A and the tail portion 6B of the fabric roll A being formed, and this operation will be carried out automatically, as it will be shown hereinafter, starting from a condition analogous to that shown in figure 3, but, however, with the fabric roll A always arranged in the winding station 5.

[0043] Then, the swinging belt 11 is raised and the fabric edge 6A is displaced into the gap 15, where said front fabric edge 6A will be driven in a sandwich form in the guide portion 17 and, at the outlet of said guide portion 17, said fabric edge 6A will be driven with an accurate overlapping onto the tail portion 6B of the fabric roll A. In this connection it should be pointed out that the tail portion 6B will be so selected as to provide a safe introduction of the tail 6B and fabric edge 6A into the roll A being formed.

[0044] As the fabric roll A achieves the set fabric length, it will be driven to the station 10 and the fabric 6 will be cut as above disclosed in the winding method for winding without waste defective fabric portions.

[0045] According to the invention, the winding station 5, and its functional associated components, forms a winding module M for winding good fabric rolls which can be arranged near a like module M for making retree fabric rolls B, said retree fabric rolls B being wound by the same winding method which has been disclosed for the good rolls A, and as it would be apparent from the operating winding steps shown in figures 11 to 16.

[0046] As shown in said figures 11 to 16, to allow the formed rolls A to be sent toward the finishing or packaging downstream station, the retree fabric roll B cores are supported on a supporting construction 37 which can be raised and lowered as schematically indicated by the double arrow 38. The reference number 39 shows the necessary cutters which can be cross-displaced for cutting through the fabric material after having formed the good and retree rolls A and B respectively. In figures 11-16 the reference number 40 shows moreover a packaging station for packaging said rollers A and B.

[0047] From the above functional and constructional

disclosure of the winding methods according to the invention, it should be apparent that the inventive winding apparatus and method allow to efficiently solve the indicated aim and achieve the mentioned advantages. In particular, the invention provides a greatly construction-wise simplified apparatus, which is much more simple than prior like apparatus requiring two or more operating stations, with an advantageous size reduction.

[0048] In this connection it should be moreover pointed out that the term "fabric" used according to the invention is provided for indicating any desired type of fabric material, as well as synthetic material fins, wax processed cloth material and so on.

[0049] The inventive apparatus allows moreover to form the fabric roll with any desired fabric roll starting procedure, i.e. either with a manual arrangement or an automatic arrangement of the cores.

[0050] A specific advantage of the inventive apparatus is its very high operation flexibility, for example as a single apparatus to be associated to other apparatus, for example for supplying or feeding the fabric core, or for performing other processing operations on the rolls, for example weighing, winding and the like apparatus. The necessary modifications would be very simple and susceptible to be easily performed by one skilled in the art.

[0051] In practicing the invention, those skilled in the art can perform modifications and variations and replacements of individual parts with other technically and/or operatively equivalent components, without departing from the scope of the invention.

[0052] Since different method steps can also be performed in a mutually overlapping relationship and/or with mutually offset operating times, it should be apparent that said operating steps, performed with said overlapping and/or time offset relationships, would also come within the scope of the invention.

Claims

1. An apparatus for winding fabrics into rolls either with or without an automatic rejection of the defective fabric and joining of the roll forming pieces, comprising, on supporting framework,

- a winding station formed by an idle roller and a driven roller which can be driven in two rotary directions,
- a fabric feeding path for feeding a fabric from a bottom of the winding station,
- a cutter movably supported crosswise of said fabric,
- a pair of pinching or locking means affecting said fabric,
- and driving and adjusting means cooperating with the movable elements of said apparatus,

characterized in that in the feeding path of

the fabric to be wound are provided a substantially horizontal first cutting portion, and a following substantially vertical fabric guide portion, said cutting portion including an endless belt substantially extending through the width of said apparatus and being entrained between a driving roller and an idle roller, and being adapted to swing between a top fabric feeding position and a bottom fabric disengagement position,

that said substantially vertical fabric guide portion is formed by an endless belt substantially extending through the width of said apparatus and being entrained between a bottom driving roller (18) and an idle top roller (19) arranged between the winding roller,

that, above said cutting portion and under said winding station, is supported said cutter movable crosswise said apparatus, and

that, under said cutting portion is provided a swinging arm having a cutting guide contour, which swinging arm is movable between a bottom rest position and a top active position at said cutting portion,

wherein said swinging belt and said swinging arm form pinching or locking means adapted to lock, during a rejecting operation for rejecting a defective fabric portion, a fabric tail portion of said fabric roll after having wound said defective fabric portion to be rejected, since the free end portion of said swinging belt presses said fabric against said swinging arm rotated to its top position.

2. An apparatus according to claim 1, **characterized in that** said cutting portion is entrained between said swinging belt driven roller and said bottom driven roller of said guide path.

3. An apparatus according to claims 1 and 2, **characterized in that** said cutting portion and said cutter are arranged under said idle winding roller.

4. An apparatus according to one or more of claims 1 to 4, **characterized in that** said swinging belt, in said cutting portion, can swing about a rotary axis of the driven transmission roller of said swinging belt.

5. An apparatus according to one or more of claims 1 to 4, **characterized in that** said swinging arm is a contoured swinging arm and comprises its guide contour pivoted at one end portion of a piston rod of a cylinder/piston unit and, at the other end portion thereof, at a swinging point rigid with the apparatus framework arranged substantially at a crossing region of said cutting portion and guided transport portion.

6. An apparatus according to one or more of claims 1

to 5, **characterized in that** said swinging belt, in said cutting portion and/or said endless belt, in said sandwich transport portion, are formed by sectors.

7. A method for winding fabrics into rolls either with or without an automatic rejection of the defective fabric and joining of the fabric roll pieces to a desired length, comprising a fabric supply for feeding the fabric along a feeding path extending from a bottom to a winding station, as provided in a winding apparatus according to one or more of claims 1 to 6, **characterized in that**

1) in forming fabric rolls without rejecting defective fabric portions said method comprises the following steps of:

- a) feeding said fabric on a substantially horizontal feeding path or swinging and driven belt, said path being accessible by a cutter arranged at a bottom of the winding station, and then along a substantially vertical fabric feeding path or motorized driven belt, leading to a position between said winding rollers, and forming a set length fabric roll,
- b) stopping the fabric web and driving the finished fabric roll to an adjoining finishing fabric roll receiving station,
- c) removing the swinging belt and cutting the fabric in a stretched condition, thereby forming a hanging front edge of said fabric and a hanging tail portion of the finished roll,
- d) relocating the swinging belt and feeding the fabric edge above said tail portion in a gap formed between said tail portion and a starting of said vertical path or guide belt with a consequent entraining, in a sandwich configuration, of the front edge of said fabric between said vertical belt and said finished fabric roll tail portion, so as to cause the fabric edge to exit the winding rollers for starting a novel fabric roller, whereas

2) in the winding method for forming fabric rolls with a rejection of the defective fabric portions, are provided the following method steps, partially including some of the above disclosed steps:

- A) a winding step a) in which on the fabric roller being formed in said winding step is also wound a portion of a detected defective fabric,
- B) a fabric cutting step b), however without any transfers of the fabric roll,

C) a step c),

D) an unwinding step for unwinding from said fabric roll the defective fabric portion by causing said defective fabric portion to fall by gravity from said fabric roll, for example on a conveyor belt,

E) a raising step for raising a cutting guide arm for arranging the tail fabric portion, on the fabric roll side, in the cutting portion,

F) an upward swinging step for upward swinging said swinging belt and locking by pushing said tail fabric portion against said cutting guide arm,

G) a separating cut step for cut separating said tail portion from said fabric roll,

H) a downward swinging step for downward swinging both said swinging belt and, successively, said swinging arm,

I) a step d) in which a front edge of said feeding fabric is directly incorporated into said overlapping fabric roller being formed, where a seaming operation is repeated for each detected defective fabric portion and, as a set length of said fabric roller is achieved,

J) a further cutting step for separating said fabric roller from said fabric web according the method 1).

8. A method according to claim 7, **characterized in that** on a circumference portion of said winding roller receiving said fabric to be wound in the winding method with rejection of the defective fabric portions, i.e. with an overlapping joining of the fabric front edge and roll tail portion, is provided an adjoining by pressure of said fabric front edge against said winding cylinder or roller, for example by a blowing action.

9. A method according to claims 7 and 8, **characterized in that** some of said method steps can be carried out in a mutual overlapping relationship and/or with mutually offset operating times.

10. An apparatus according to one or more of claims 1 to 7, **characterized in that** said winding station (5) and related functional components and assemblies (9, 11, 17, 21) form a module (M) and that in said apparatus are provided two analogous modules (M), of which a first module (M) comprises the winding station (5) for winding good fabric rolls (A) and the second module (M) comprises a winding station (5) for winding retree fabric rolls (B).

11. An apparatus according to one or more of claims 1 to 7 and 10, **characterized in that** the tubular device (29) for automatically adjoining the fabric (6) to the driven roller (4) of the associated winding station

(5) is supported in a structure (40) having a top concave side (41).

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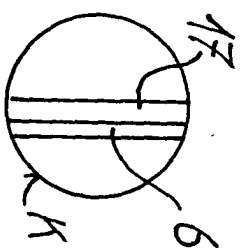
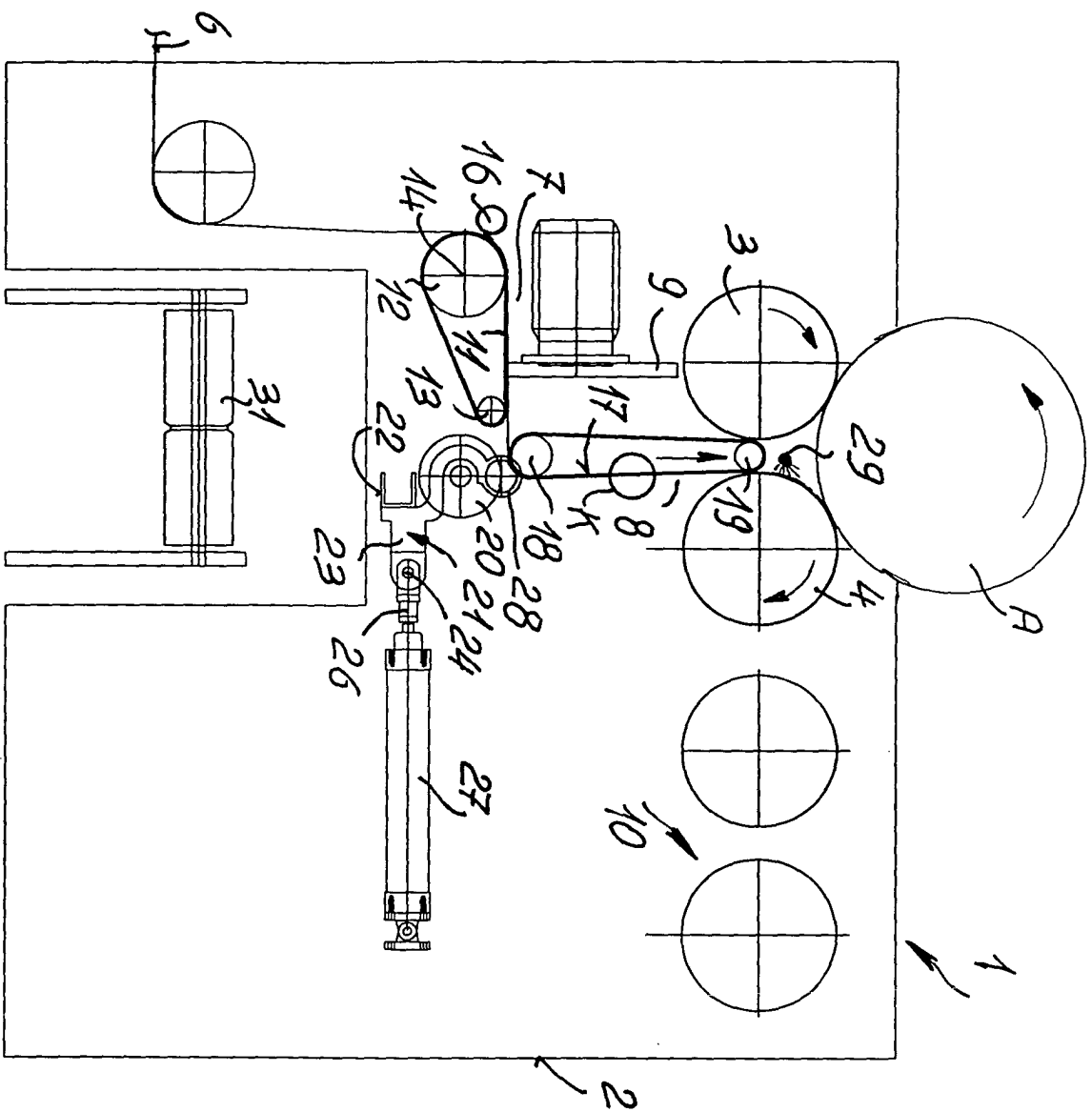


Fig. 1

Fig. 1A

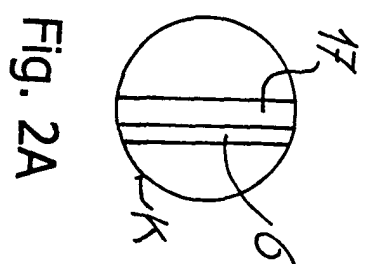
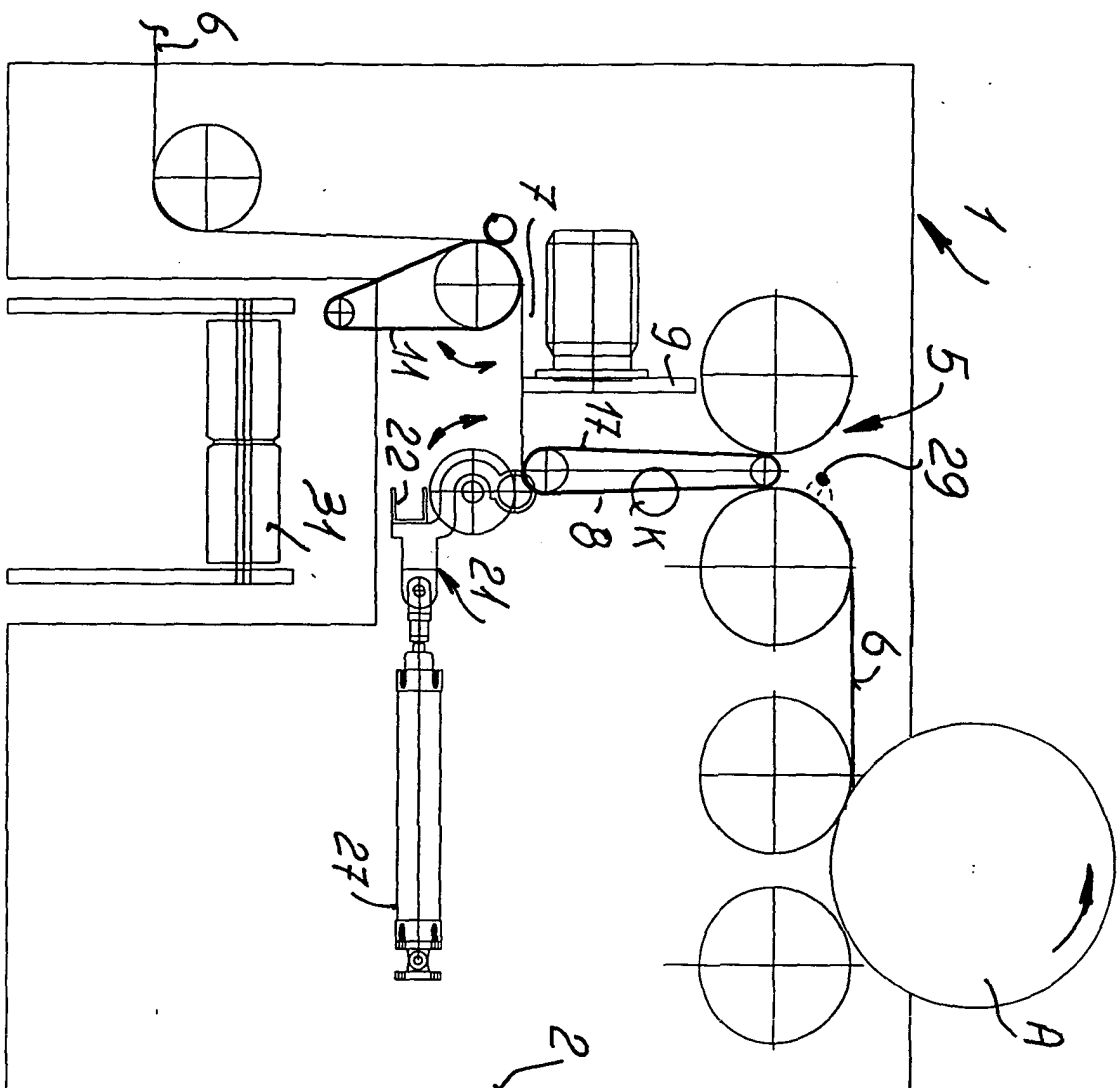


Fig. 2

Fig. 2A

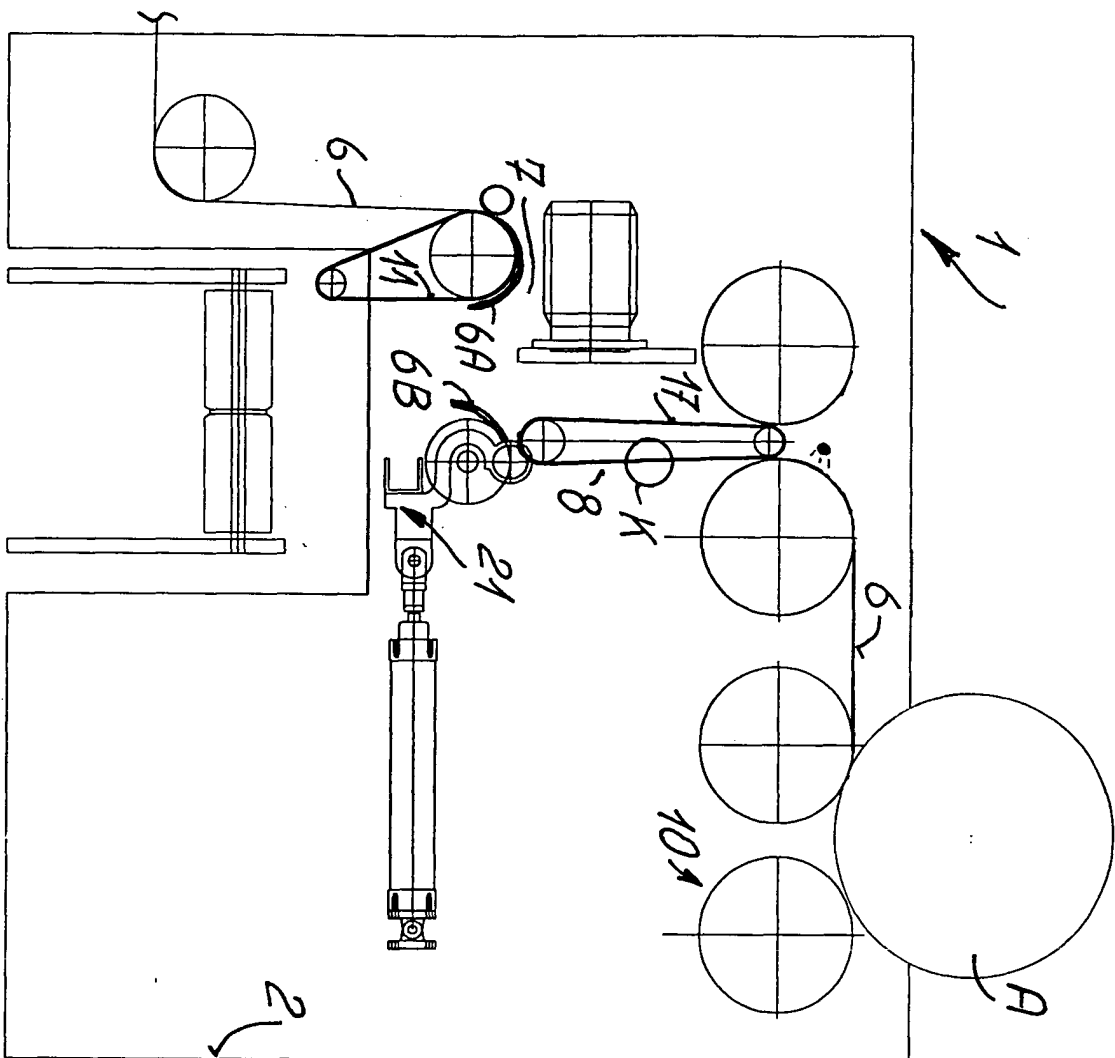


Fig. 3

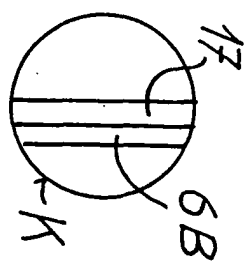


Fig. 3A

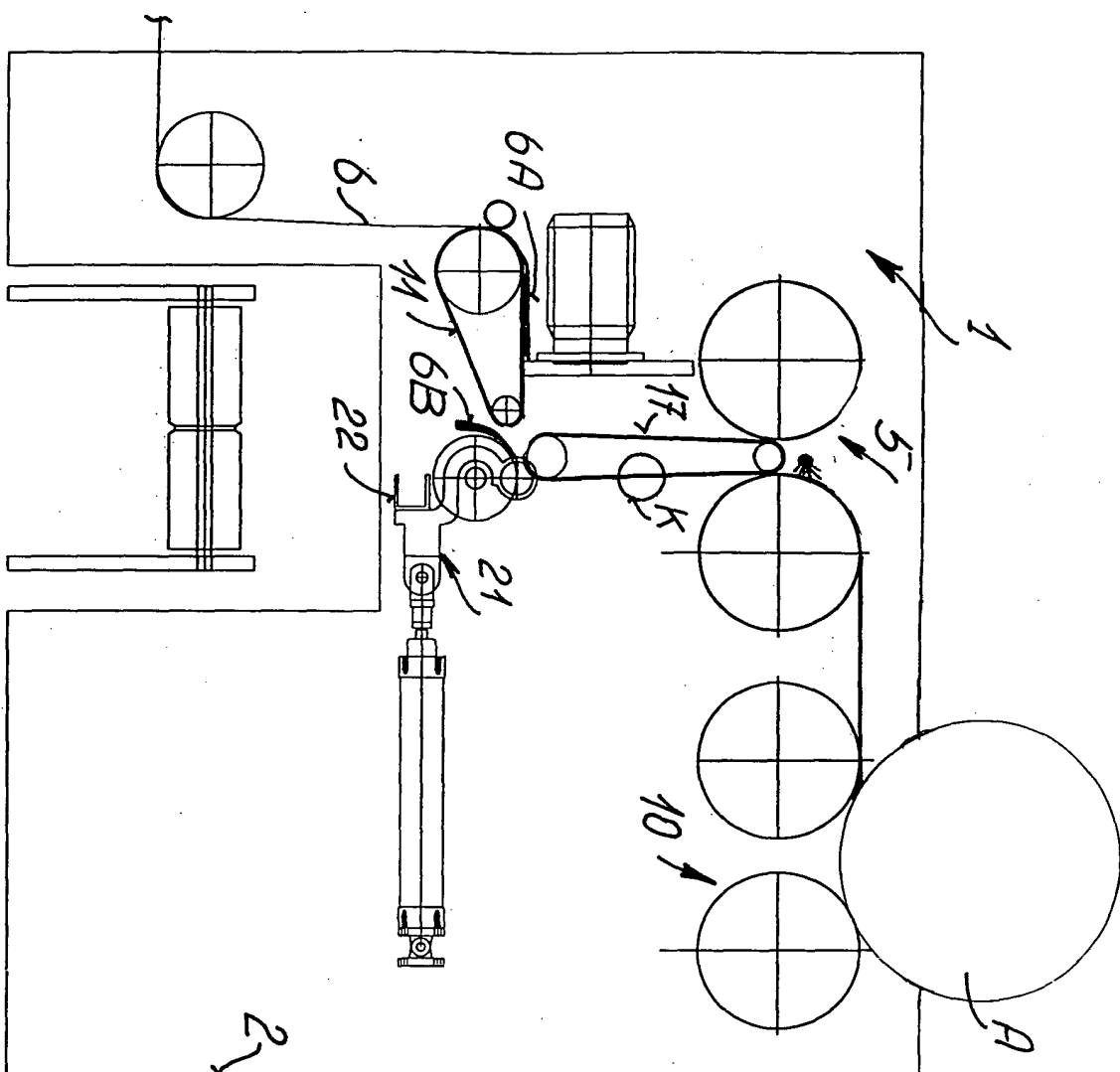


Fig. 4

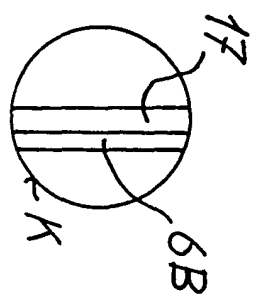


Fig. 4A

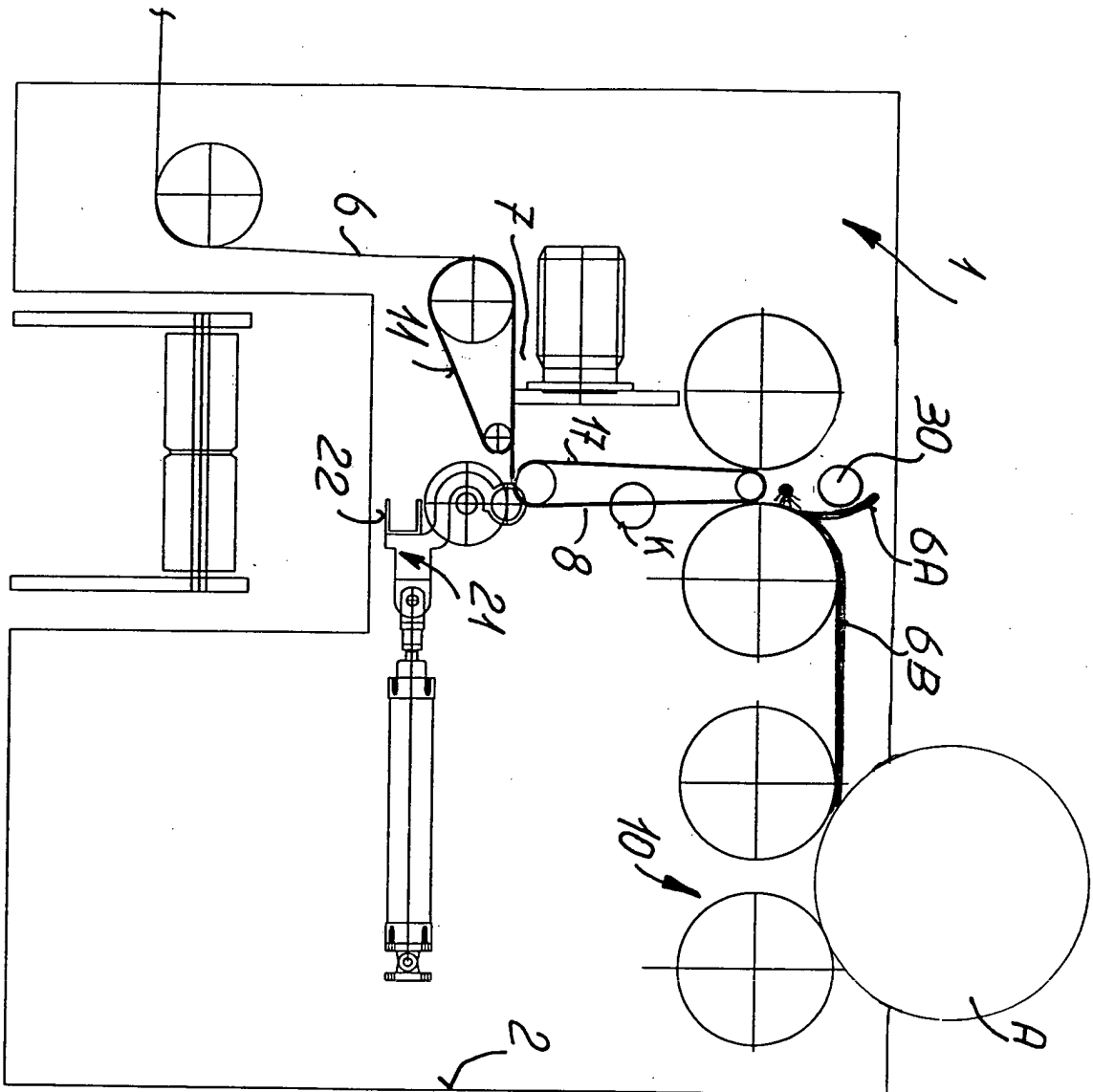


Fig. 5

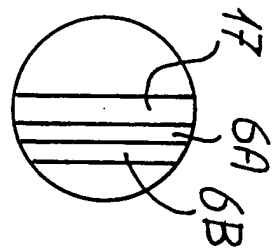


Fig. 5A

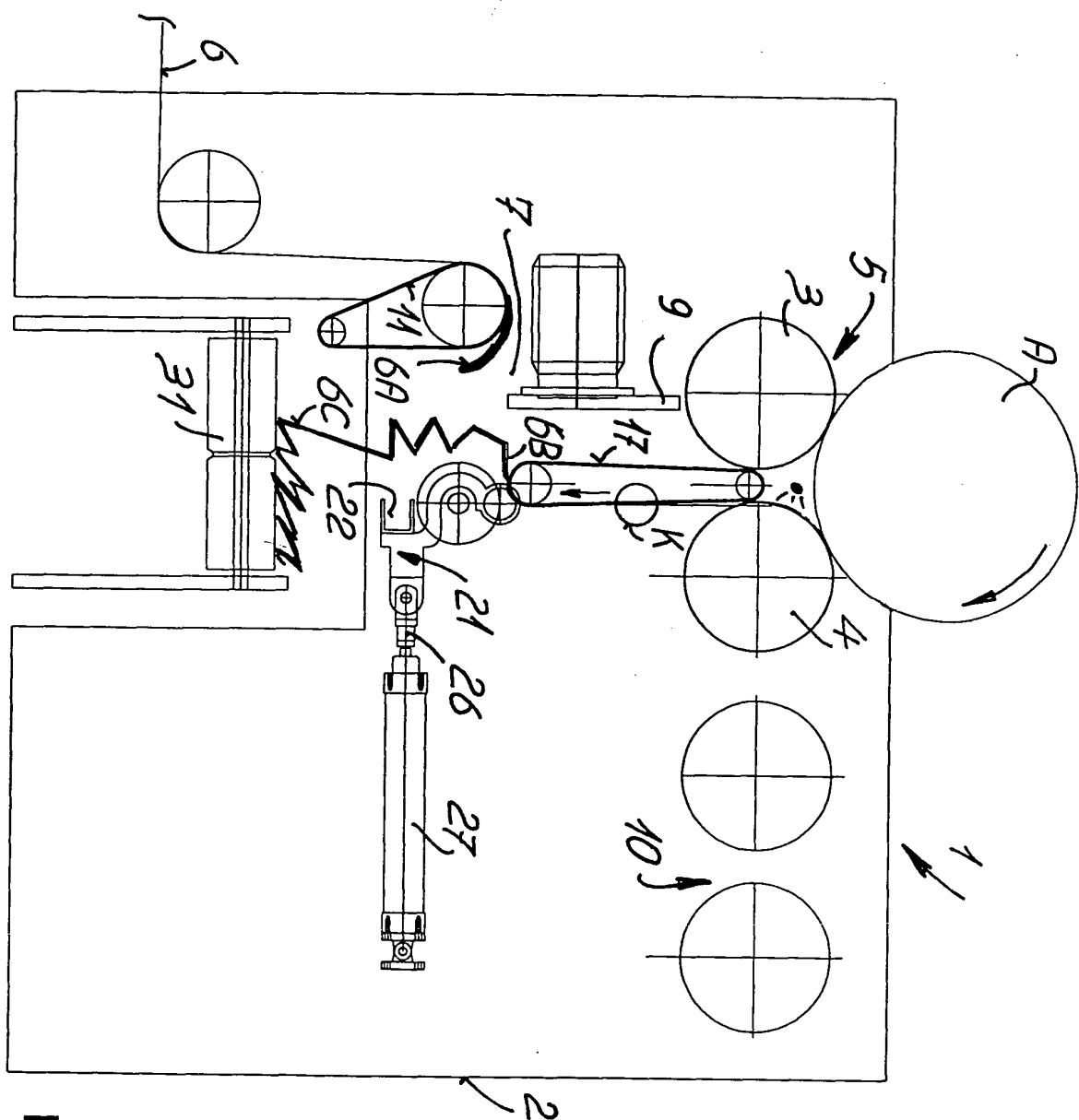


Fig. 6

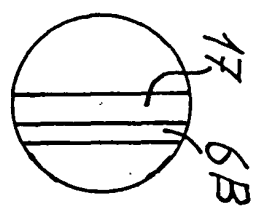


Fig. 6A

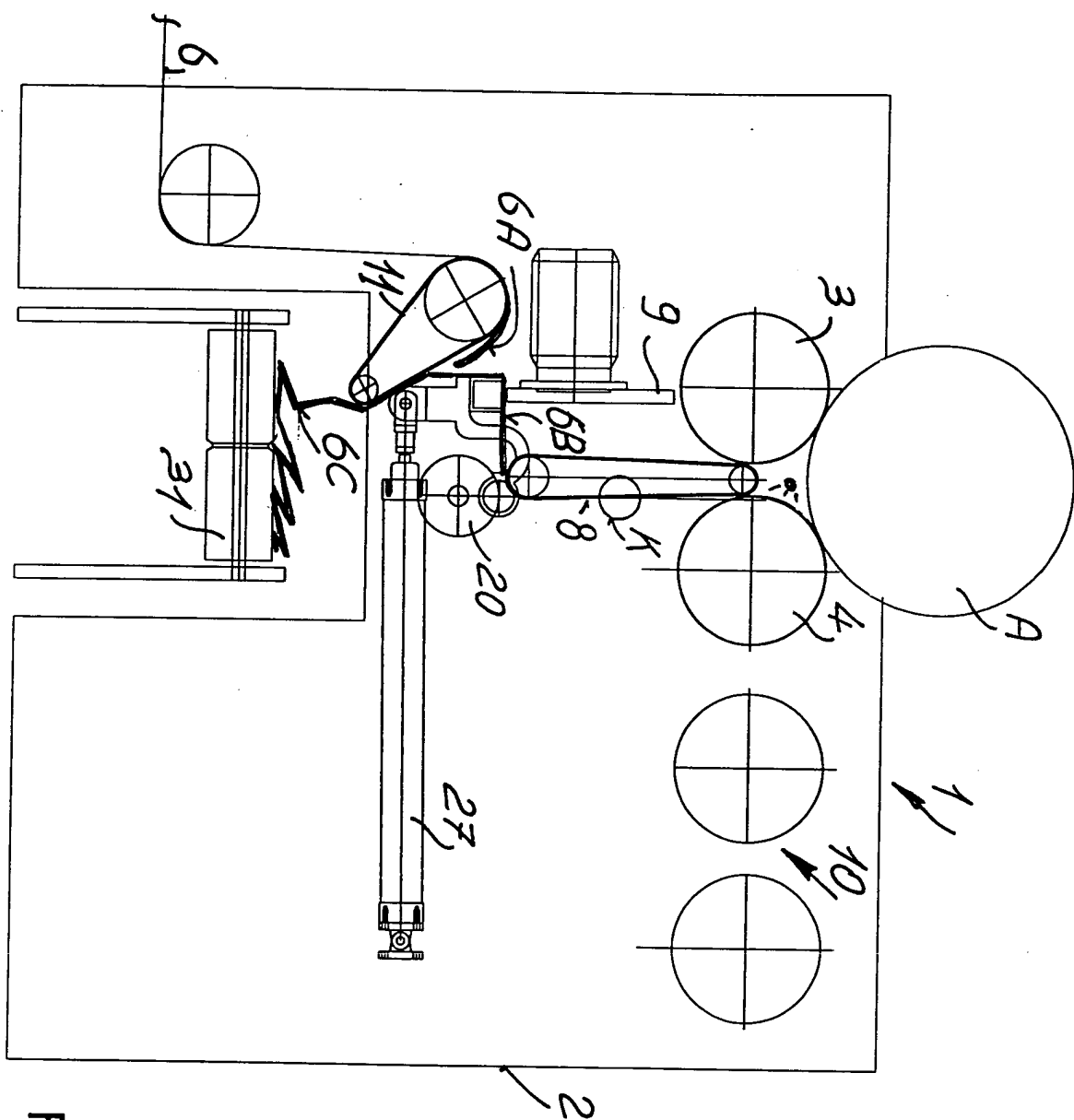


Fig. 7

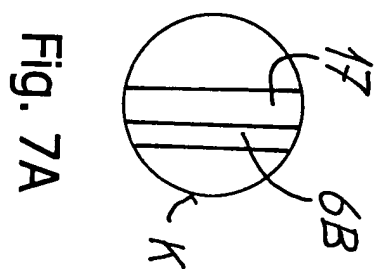


Fig. 7A

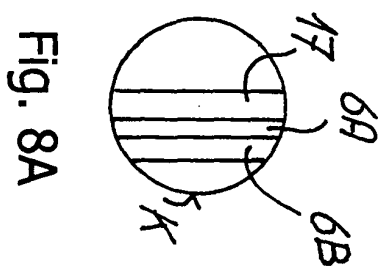
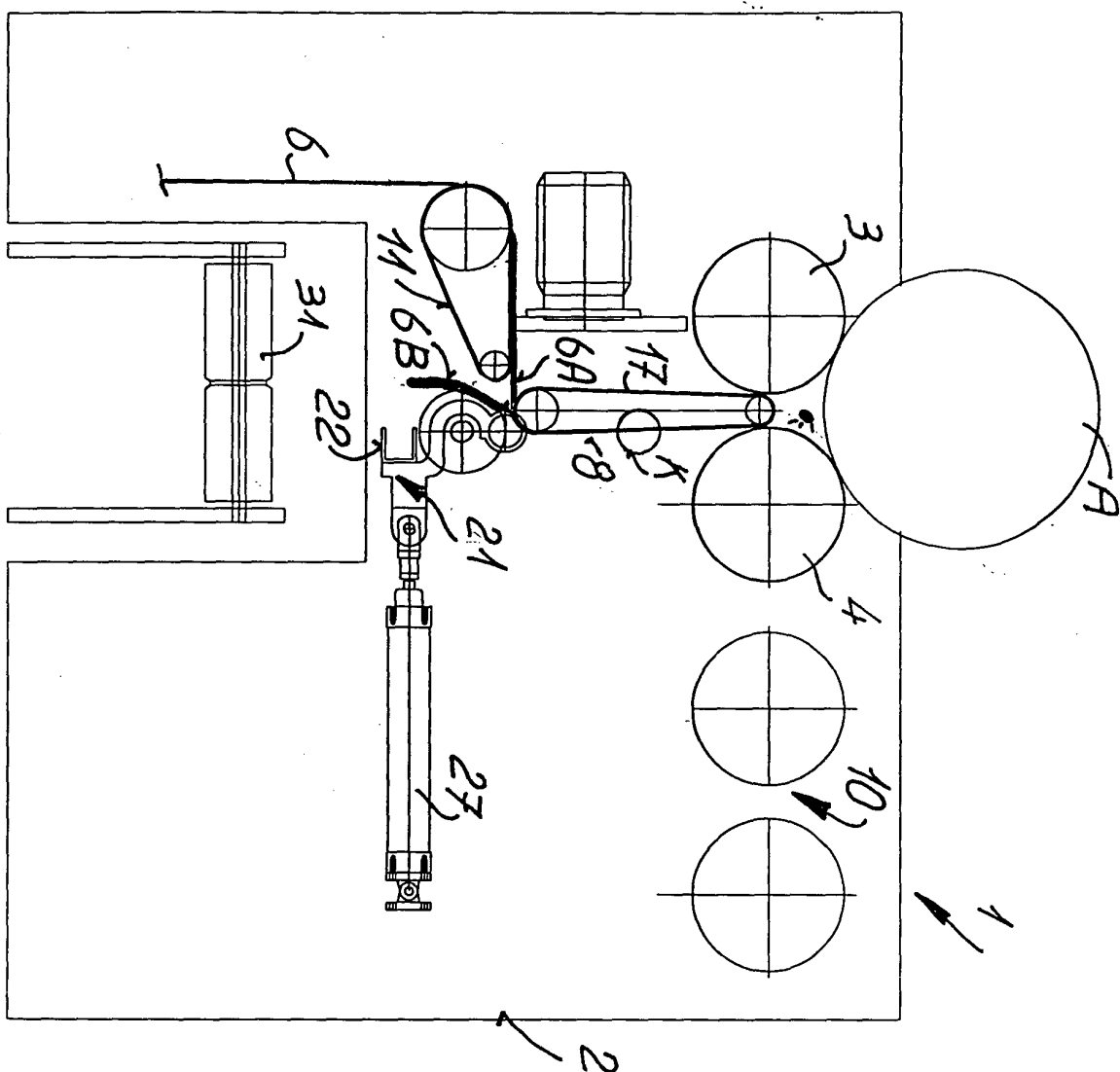


Fig. 8

Fig. 8A

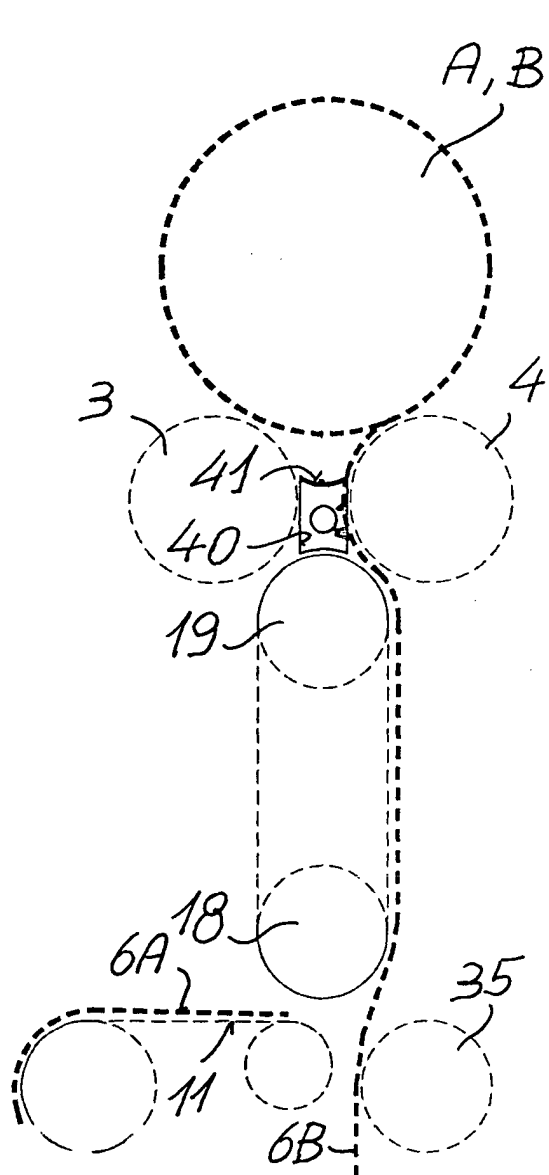


Fig. 9

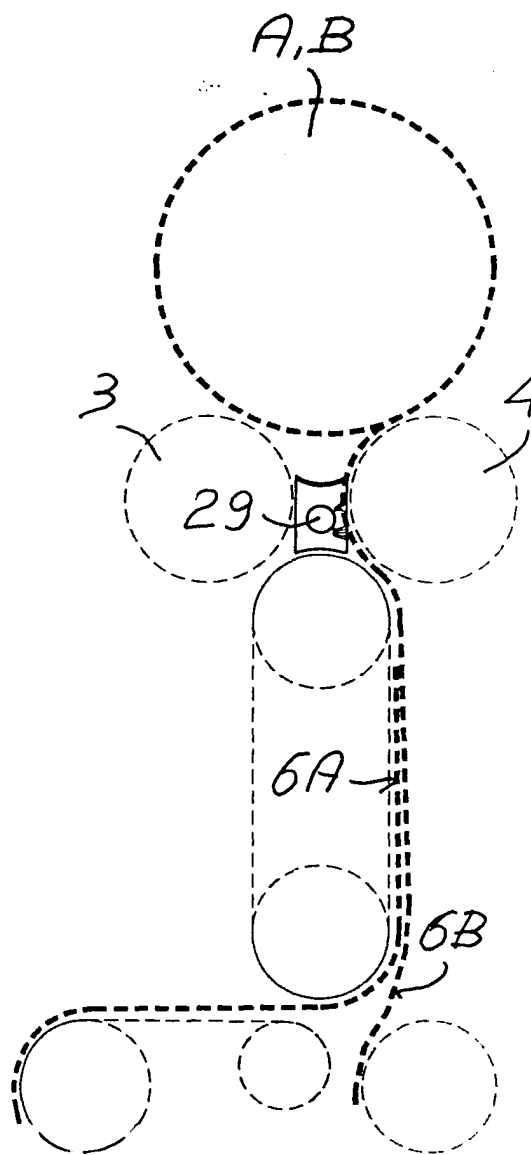


Fig. 10

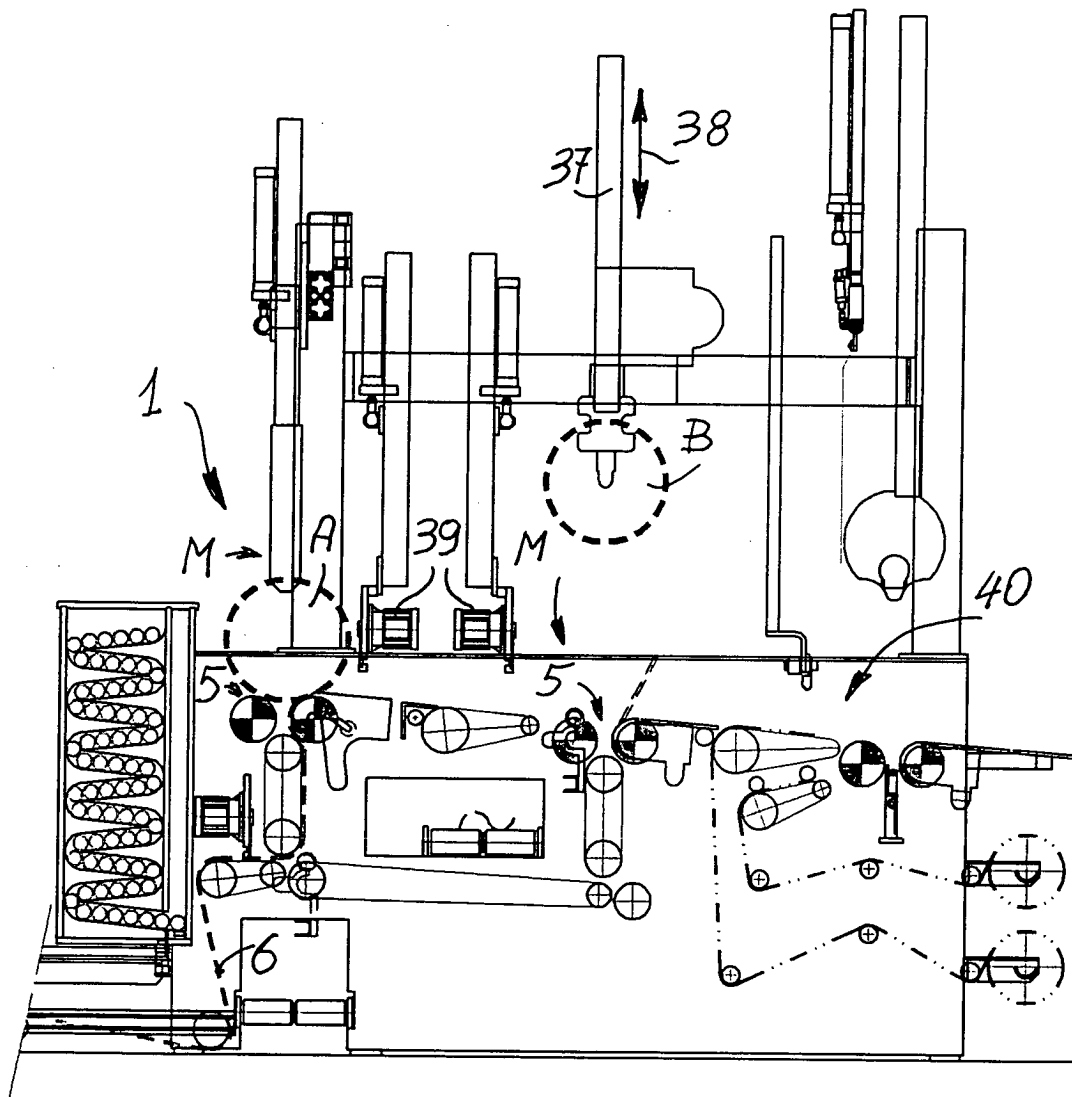


Fig. 11

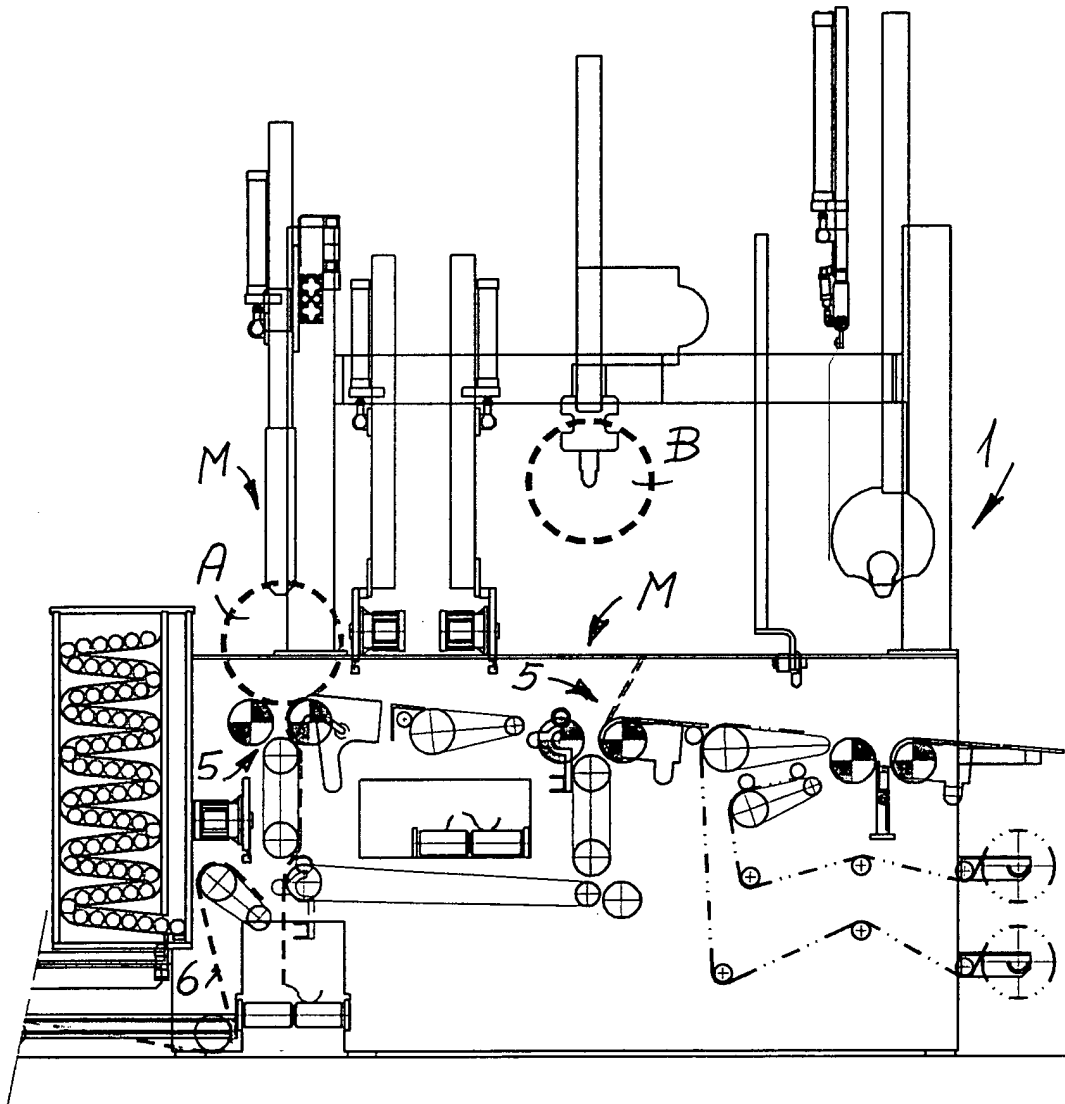


Fig. 12

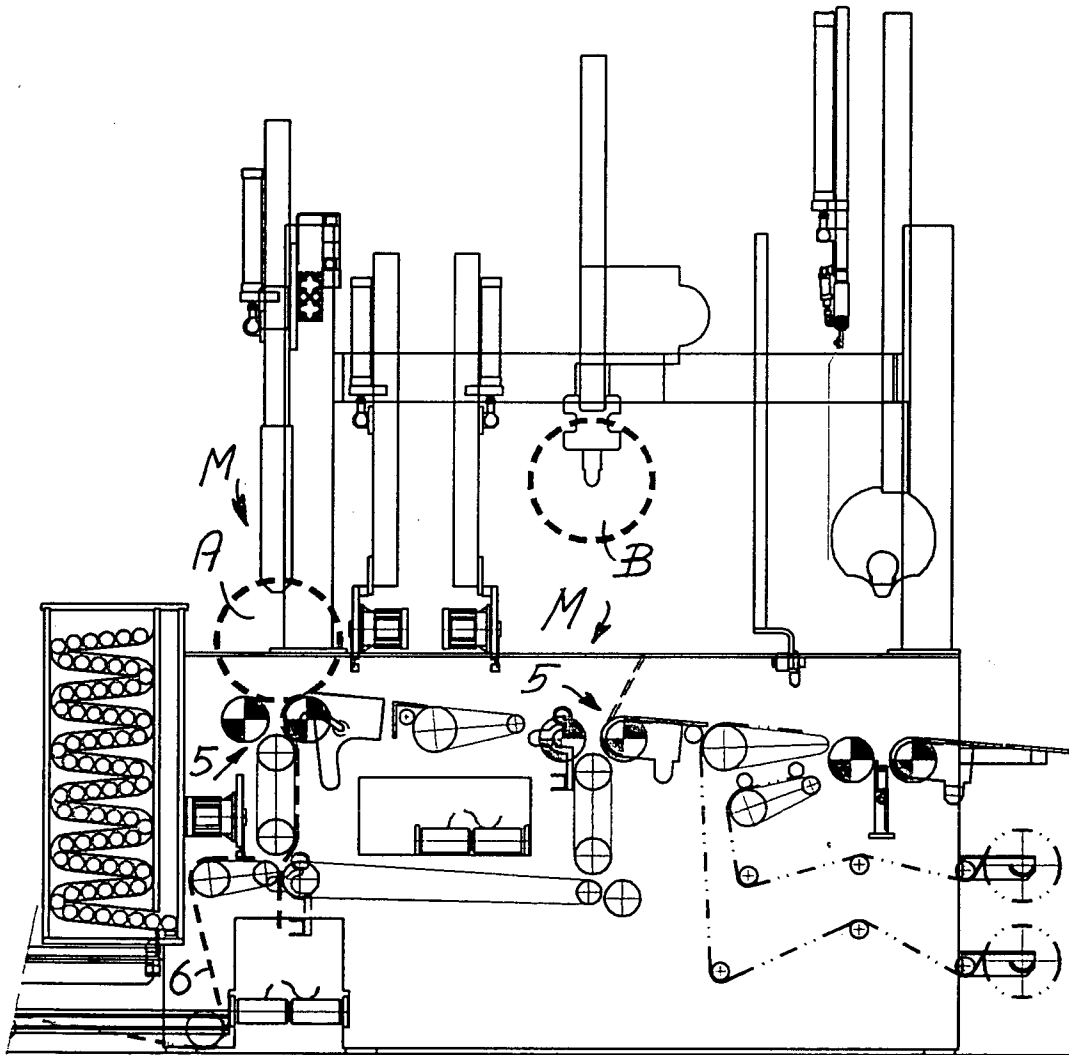


Fig. 13

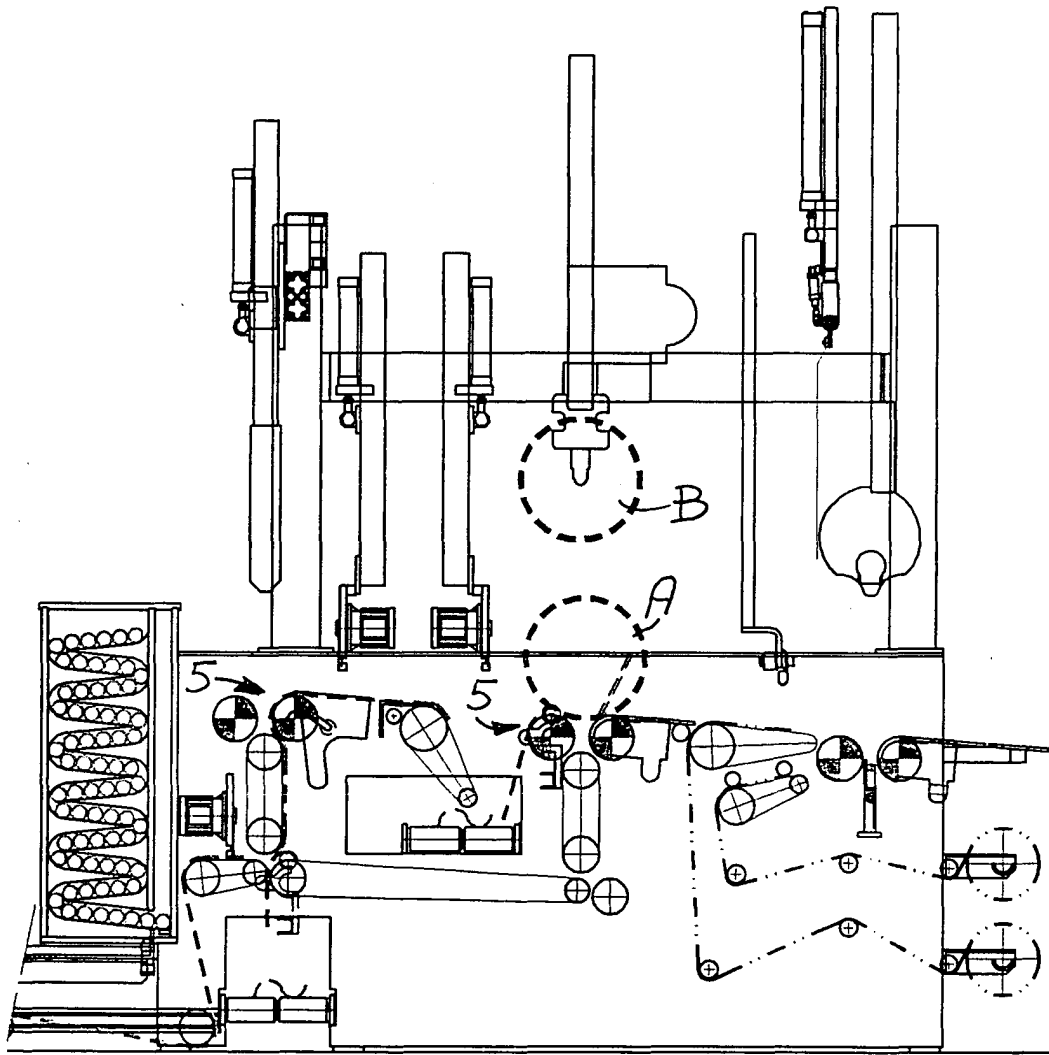


Fig. 14

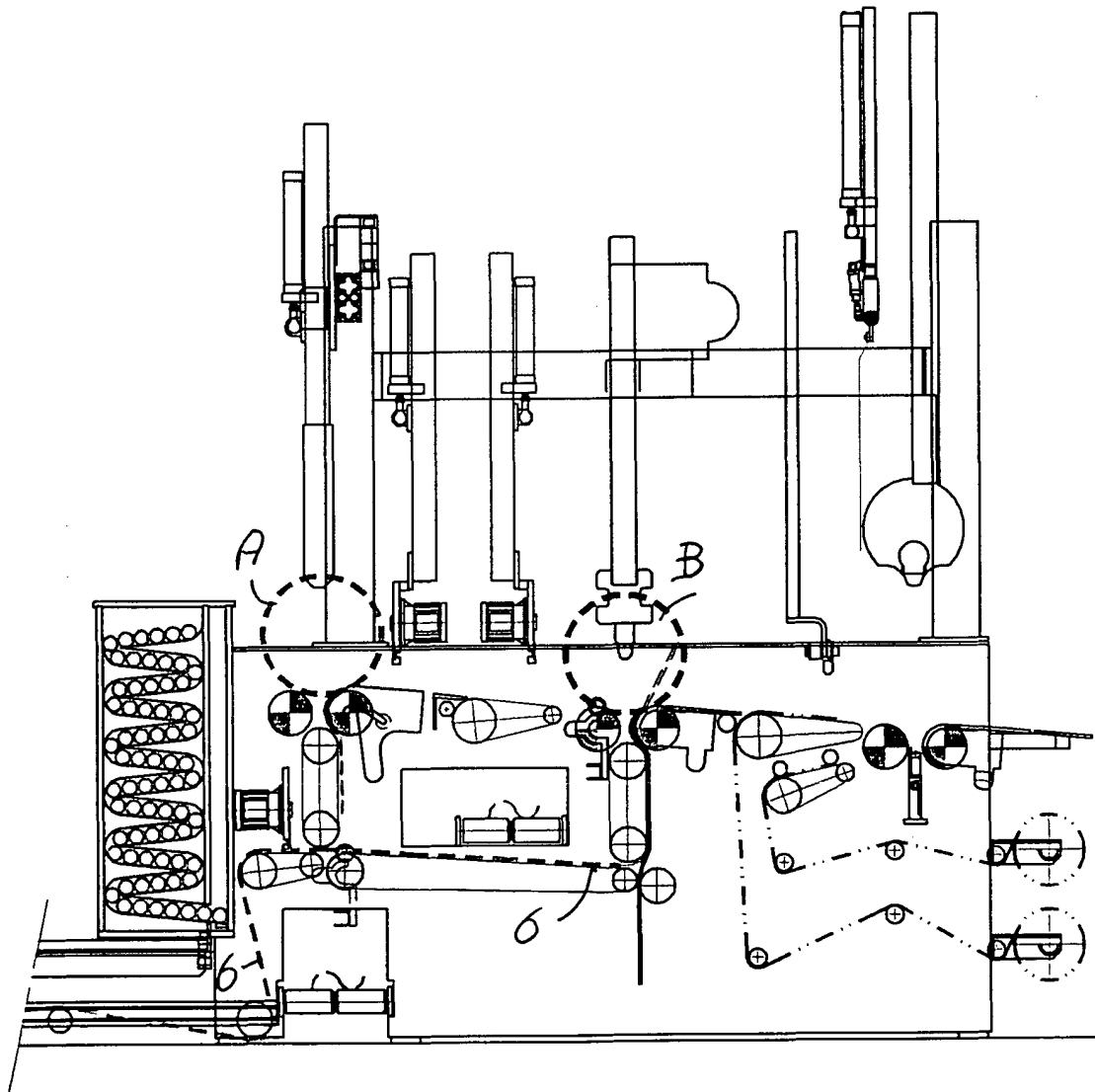


Fig. 15

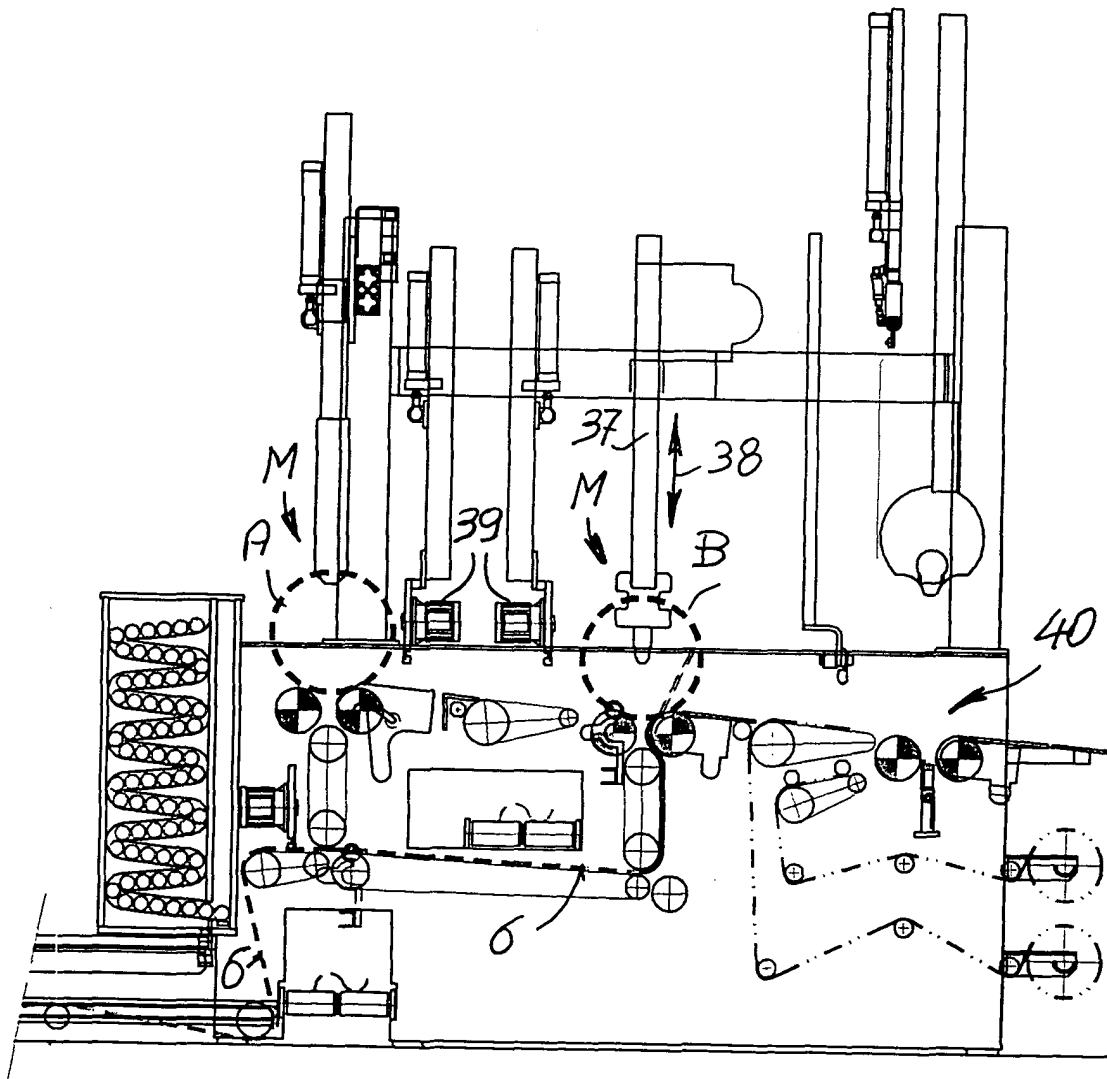


Fig. 16