(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 242 879 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
23.10.2019 Bulletin 2019/43

(21) Application number: **09713313.6**

(22) Date of filing: **18.02.2009**

(51) Int Cl.:
D01G 19/18 *(2006.01)* ***D01H 5/62*** *(2006.01)*

(86) International application number:
PCT/IB2009/050654

(87) International publication number:
WO 2009/104139 (27.08.2009 Gazette 2009/35)

(54) Transport device of a textile machine

Transportvorrichtung einer Textilmaschine

Dispositif de transport d'une machine textile

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK TR

(30) Priority: **22.02.2008 IT BS20080040**

(43) Date of publication of application:
27.10.2010 Bulletin 2010/43

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Description

[0001] The present invention relates to a transport device of a textile machine, especially a combing machine.

[0002] On a fibre processing line for the production of a yarn, after the initial phases of opening and cleaning the fibre, carding is performed by carding machines after which the fibre appears in the form of a web.

[0003] After processing on a lap winder where necessary, during which various separate webs are combined to form a lap, the web or lap is combed by a combing machine so as to produce a web in which the fibres are extremely parallel and clean.

[0004] Generally, a combing machine, downward of the combing device, provides a device for transporting the web, composed of a set of coupled rollers.

[0005] Said transport device comprises a drafting group composed of coupled cylinders which the web passes through, moved so as to achieve a drafting of the web before being forwarded for subsequent processing.

[0006] It has been found that rollers of the drafting group have the tendency to retain on the surface some residues, generally composed of fibre filaments which detach themselves from the web, and of dirt.

[0007] The residues show a tendency to accumulate, significantly disturbing the drafting operations in that they interfere with the coupling of the drafting rollers.

[0008] Often, the transport device comprises a wiper group, positioned against the drafting roller, composed of a support rigidly attached to the combing machine, inside which is a rubber band, held in contact with the surface of the drafting roller.

[0009] As the drafting roller rotates, the rubber band gathers the residues accumulated on the same and detaches them from the surface of the roller.

[0010] However, the known wiper groups show some malfunctions, due mainly to the tendency of the rubber band to stick inside its seat in the support, so that if, as often happens, it is unable to remove the residues from the surface of the roller, it creates structural interference with said roller which sometimes leads to the supports of the same breaking.

[0011] A transport device of a textile machine according to the preamble of claim 1 is known from GB 2613223 A.

[0012] The purpose of the present invention is to provides for a transport device of a textile machine according to claim 1, especially a combing machine, which overcomes the drawbacks mentioned and satisfies the aforesaid requirements.

[0013] The characteristics and advantages of the wiper group according to the present invention will be evident from the description below, made by way of a non-limiting example according to the attached figures, wherein:

- figure 1 shows a transport device of a combing machine, comprising a wiper group according to the present invention, in a functioning configuration;
- figure 1a shows an enlargement of a portion of the transport device in figure 1;
- figure 2 shows a perspective view of a portion of the transport device in figure 1;
- figure 3 shows the transport device in figure 1, in a configuration of cleaning of the wiper group;
- figure 4 shows the transport device in figure 1, in a configuration of replacement of the wiper group; and
- figure 5 shows a transport device of a combing machine, comprising a wiper group according to a further embodiment of the invention.

[0014] For clarity of exposition henceforth the description will refer to a wiper group of a drafting roller of a combing machine, but such wiper group may also be utilised for drafting rollers on other textile machines such as a drafting frame or carding machine.

[0015] With reference to the attached figures, reference numeral 1 denotes a transport device of the web W of a combing machine.

[0016] The combing machine comprises a combing device, for example with rotating combs, into which a web or fibre lap is fed for combing and, downward of the combing device, said transport device 1 is positioned, to transport the web W downwardly from the combing machine.

[0017] In the transport device, the web is driven by coupled rollers, passing through the opening between them.

[0018] The transport device comprises at least one pressure roller, positioned over the web in transit.

[0019] For example, following the direction of transit of the web, the transport device comprises a first pressure roller 2, a second pressure roller 4, a third pressure roller 6 and a fourth pressure roller 8, all positioned over the web in transit.

[0020] The pressure rollers 2, 4, 6, 8 are connected to respective actuators 2a, 4a, 6a, 8a for example pneumatic, able to press the respective rollers against the web in transit.

[0021] This way a pressure of the pressure rollers against the web in transit is actuated.

[0022] Preferably, the transport device comprises sensors able to detect an external action contrary to the thrust direction of said actuators.

[0023] For example said sensors comprise a micro switch built-in to the actuator, so as to detect the backward movement of the actuator piston.

[0024] The combing machine also comprises a frame 10, hinged to the body so that when raised from the body access to the combing device or transport device inside the combing machine is enabled.

[0025] Preferably, the first, second and third pressure rollers 2, 4, 6 are joined to the frame 10 by means of the actuators 2a, 4a, 6a, attached to it.

[0026] The transport device also comprises a first lower roller 12, parallel to and coupled with the first pressure roller 2, so as to be aligned vertically with it, that is in such a way that the direction of translation of the actuator

piston 2a is the radial direction of said first lower roller 12.

[0027] The transport device also comprises a second lower roller 14 and a third lower roller 16, parallel to the pressure rollers 2, 4, 6.

[0028] Preferably, the second lower roller 14 and the third lower roller 16 are alongside the pressure roller 4 and respectively side by side upwardly and downwardly of their rotation axis, to form the openings for transit of the web so that the web in transit between the said openings remains essentially in contact with the surface of the second pressure roller 4.

[0029] The transport device 1 comprises in addition a main drafting roller 20, positioned underneath, alongside the third pressure roller 6 and the fourth pressure roller 8 to form the transit opening for driving the web.

[0030] The main drafting roller 20 and the pressure rollers 6, 8 are reciprocally positioned so that the web in transit undergoes a curving of its path downwards.

[0031] The lower rollers 12, 14, 16 and the main drafting roller 20 are motorised, that is they are connected to one or more motorizations which impose, directly or indirectly through kinematic chains, a desired speed of rotation to each.

[0032] Said rotation speeds are such as to produce a drafting of the web, for instance between the first lower roller 12 and the second lower roller 14 and between the third lower roller 16 and the main drafting roller 20.

[0033] Preferably, the entity of the draft between the first lower roller 12 and the second lower roller 14 is much less than the entity of the draft between the third lower roller 16 and the main drafting roller 20, so much so that in the first case one usually speaks of pre-drafting and in the second of main drafting.

[0034] The transport device 1 comprises in addition, a funnel 22, positioned downwardly of the main drafting roller 20, towards which the drafted web is driven and through which the web transits, condensing, before being fed onwards for subsequent processing.

[0035] Preferably, the combing machine also comprises aspiration devices positioned below the transport device, able to aspirate the residues.

[0036] Said aspiration devices comprise an aspiration nozzle 29, positioned under the lower rollers 12, 14, 16.

[0037] The transport device 1 also comprises at least one wiper group 30 coupled to a roller to gather and detach the surface residues from it.

[0038] According to embodiment variations, the wiper group is coupled to the first or second or third lower roller 12, 14, 16, or a number of wiper groups are provided, each coupled to a roller.

[0039] In the preferred embodiment, the wiper group 30 is coupled to the main drafting roller 20.

[0040] The wiper group 30 comprises a support 32 fitted with a seat 34 and a soft band 36, lodged in said seat 34.

[0041] For instance, the seat is in the form of a channel and the band sits on the bottom of it.

[0042] The band 36 is lodged inside the seat 34 with play. In other words the thickness of the band 36 is less than the width of the seat, so that between the band and the seat there is play.

[0043] Preferably, the band 36 is made in rubber and has a lip 38 protruding from the seat 34, in contact with the surface of the main drafting roller 20.

[0044] Preferably, the lip 38 protrudes inclined in the direction of rotation of the main drafting roller 20, to drag over this without sticking or causing unwanted vibrations.

[0045] The support 32 is oscillating and said wiper group comprises influencing devices able to constantly influence the support 32 to press the band 36 towards the surface of the main drafting roller 20.

[0046] According to the invention, the wiper group 30 comprises a flange 40 for attachment to the body of the combing machine, while the support 32 is mounted in an oscillating manner to the flange 40 by means of the interposition of said influencing devices.

[0047] The support 32 is mounted to the flange 40 so as to rotate around a rotation axis X, incident to a plane orthogonal to the rotation axis of the main drafting roller 20.

[0048] Preferably, in addition, the influencing devices comprise a torsion spring 42, by means of which the support 32 is hinged to the flange 40, so as to be constantly influenced to rotate in the direction bringing the band 36 against the surface of the main drafting roller 20.

[0049] For instance, the torsion spring is composed of a cylinder in elastic material, for example polyurethane.

[0050] According to a preferred embodiment, the flange 40 has at least one slotted hole 44 to attach the flange to the body of the combing machine in an adjustable manner.

[0051] According to the embodiment shown, the wiper group 30 comprises a pair of supports 32 and a pair of flanges 40, respectively hinged to each other and positioned close to the axial extremities of the main drafting roller 20.

[0052] The band 36 is inserted in the seats 34 of each support 32, thereby lying on its extremities in the manner of a beam between two supports.

[0053] Apart from the connection produced by the band 36, which is in any case loose, the two flange-support assemblies are structurally independent in the same way as the action of the influencing means on each support is independent so that, to spontaneously move the band against the surface of the main drafting roller 20, one support is rotated more or less than the other in relation to its flange.

[0054] Advantageously this makes it possible to spontaneously accommodate the band in the seats of the supports and against the main drafting roller 20, absorbing dimensional tolerance of the band, assembly tolerance of the wiper group and any wear of the band itself.

[0055] During the course of normal use of the combing machine, the web is driven by the transport device 1 and undergoes drafting between the first pressure roller 2 and last pressure roller 8.

[0056] During the course of processing, for example on the main drafting roller, residues are accumulated and pile up composed mainly of filaments which have detached from the web and from dirt, interfering structurally with the rollers themselves.

[0057] The band 36 of the wiper group, is held against the main drafting roller 20, so that it easily gathers the residues, while the roller proceeds to rotate, detaching them from the surface.

[0058] In the presence of residues which resist the action of the band, the oscillation of the support absorbs the ensuing shock, preventing sticking and breaking.

[0059] To clean the wiper group, it is sufficient to rotate the support 32, distancing the lip 38 of the band 36 from the main drafting roller 20 (figure 3).

[0060] This way, for example, the lip is accessible to an operator who can easily clean it.

[0061] To perform replacement operations of the band, it is again sufficient to rotate the support 32, distancing the lip 38 of the band 36 from the main drafting roller 20 and removing the band 36 from its seats 34, before replacing it (figure 4).

[0062] According to the invention the support 32 is attached to the body of the combing machine and has the seat 34 inside which the band 36 is lodged, with play.

[0063] In other words the thickness of the band 36 is less than the width of the seat 34, so that between the band and the seat there is play.

[0064] The band comprises the lip 38, protruding from the seat 34 against the main drafting roller 20.

[0065] In said embodiment variation, the wiper group 30 comprises a spring 40, lodged in the seat 34 of the support 32, between the band 36 and the bottom of the seat 34.

[0066] The spring 40 constantly influences the band 36 to hold it against the main drafting roller 20.

[0067] Innovatively, the wiper group according to the present invention makes it possible to detach the residues from the drafting roller and, in the presence of residues resistant to detachment, easily absorbs the ensuing action of interference, preventing breakage of the parts involved or the significant warping of the band, which would entail poor functioning of the wiper group.

[0068] Advantageously moreover, the band naturally takes up position inside the seats of the supports, thereby helping to absorb the interference of the residues and facilitating assembly of the wiper group.

[0069] According to a further advantageous aspect, the wiper group is easy to clean: it is, in fact, sufficient to rotate the support to bring the band into such a position that the lip is accessible and can therefore be cleaned of any residues accumulated.

[0070] According to yet a further advantageous aspect, the wiper group is easy to repair; for example, after rotating the support the band can easily be removed without undergoing interference from other mechanical parts.

Claims

1. Transport device of a textile machine comprising:

- at least one drafting roller (20);
- a wiper group (30) comprising:

  - a pair of supports (32), each having a seat (34);
  - a band (36) extending mainly along the rotation axis of the drafting roller (20), able to lie against the surface of the drafting roller (20), at least partially lodged in said seats (34), wherein the supports (32) are supported in an oscillating manner to absorb the interference on the band of the residues accumulated on the drafting roller;
  - a pair of flanges (40) attached to the body of the textile machine, said supports (32) being respectively hinged to the flange (40), distanced along the rotation axis of the drafting roller;

  characterised in that said at least one drafting roller (20) is coupled to a pressure roller (6) and **in that** said band (36) is lodged in the seats (34) of said supports (32) with play in the direction of the thickness inside the seat (34).

2. Transport device (1) according to claim 1, wherein, apart from the connection produced by the band (36), the two flange-support assemblies are structurally independent.

3. Transport device (1) according to claim 1 or 2, wherein the support (32) is rotatable around an axis incident to a plane perpendicular to the rotation axis of the roller.

4. Transport device (1) according to any of the previous claims, comprising influencing devices able to constantly influence the support (32) to press it so that the band (36) is held against the drafting roller.

5. Transport device (1) according to claim 4, wherein the influencing means comprise a torsion spring, for example composed of a cylinder in elastic material, such as polyurethane

6. Transport device (1) according to claim 3 and 5, wherein the support (32) is hinged to the flange (40) by means of said torsion spring.

7. Transport device (1) according to any of the previous claims, wherein the band (36) comprises a lip (38) protruding from the seat (34), able to move against the drafting roller, said lip being inclined in the direction of rotation of the drafting roller.

8. Transport device (1) according to any of the previous claims, comprising aspiration devices positioned under the drafting roller (20).

9. Transport device (1) according to any of the previous claims, comprising an actuator (6a) able to press the pressure roller (6) towards the drafting roller (20), and sensor devices able to detect an action on the actuator piston contrary to the thrust direction.

10. Combing machine comprising a transport device (1) made according to any of the previous claims.

11. Drafting frame comprising a transport device (1) made according to any of the claims from 1 to 9.

12. Carding machine comprising a transport device (1) made according to any of the claims from 1 to 9.

Patentansprüche

1. Transportvorrichtung einer Textilmaschine, die umfasst:

    - wenigstens eine Streckrolle (20);
    - eine Wischergruppe (30), die umfasst:

        - ein Paar von Haltern (32), die jeweils ein Auflager (34) haben;
        - ein Band (36), das sich hauptsächlich entlang der Drehachse der Streckrolle (20) erstreckt, das fähig ist, gegen die Fläche der Streckrolle (20) anzuliegen, das wenigstens teilweise in den Auflagern (34) deponiert ist, wobei die Halter (32) in einer schwingenden Weise gehalten werden, um die Störung der Reste, die auf der Streckrolle angesammelt sind, auf dem Band aufzufangen;
        - ein Paar Flansche (40), die an dem Körper der Textilmaschine befestigt sind, wobei die Halter (32) jeweils gelenkig an dem Flansch (40) befestigt sind, die entlang der Drehachse der Streckrolle beabstandet sind;

    dadurch gekennzeichnet, dass die wenigstens eine Streckrolle (20) mit einer Druckrolle (6) gekoppelt ist und dass das Band (36) in den Auflagern (34) der Halter (32) mit einem Spiel in der Richtung der Dicke im Inneren des Auflagers (34) deponiert ist.

2. Transportvorrichtung (1) nach Anspruch 1, wobei die zwei Flanschhalteanordnungen, abgesehen von der Verbindung, die durch das Band (36) erzeugt wird, baulich unabhängig sind.

3. Transportvorrichtung (1) nach Anspruch 1 oder 2, wobei der Halter (32) um eine Achse drehbar ist, die auf eine Ebene senkrecht zu der Drehachse der Rolle einfällt.

4. Transportvorrichtung (1) nach einem der vorhergehenden Ansprüche, die Einwirkungsvorrichtungen umfasst, die fähig sind, beständig auf den Halter (32) einzuwirken, um ihn derart zu drücken, dass das Band (36) gegen die Streckrolle gehalten wird.

5. Transportvorrichtung (1) nach Anspruch 4, wobei die Einwirkungsmittel eine Torsionsfeder umfassen, die zum Beispiel aus einem Zylinder aus elastischem Material, wie etwa Polyurethan, aufgebaut ist.

6. Transportvorrichtung (1) nach Anspruch 3 und 5, wobei der Halter (32) mittels der Torsionsfeder gelenkig an dem Flansch (40) befestigt ist.

7. Transportvorrichtung (1) nach einem der vorhergehenden Ansprüche, wobei das Band (36) eine von dem Auflager (34) vorstehende Lippe (38) umfasst, die fähig ist, sich gegen die Streckrolle zu bewegen, wobei die Lippe in die Drehrichtung der Streckrolle geneigt ist.

8. Transportvorrichtung (1) nach einem der vorhergehenden Ansprüche, die Ansaugvorrichtungen umfasst, die unter der Streckrolle (20) positioniert sind.

9. Transportvorrichtung (1) nach einem der vorhergehenden Ansprüche, die einen Aktuator (6a), der fähig ist, die Druckrolle (6) in Richtung der Streckrolle (20) zu drücken, und Sensorvorrichtungen, die fähig sind, eine Tätigkeit des Aktuatorkolbens entgegen der Axialschubrichtung zu erfassen, umfasst.

10. Kämmmaschine, die eine Transportvorrichtung (1) umfasst, die nach einem der vorhergehenden Ansprüche hergestellt ist.

11. Streckwerk, das eine Transportvorrichtung (1) umfasst, die nach einem der Ansprüche 1 bis 9 hergestellt ist.

12. Kardiermaschine, die eine Transportvorrichtung (1) umfasst, die nach einem der Ansprüche 1 bis 9 hergestellt ist.

Revendications

1. Dispositif de transport d'une machine textile, comprenant :

    - au moins un rouleau d'étirage (20) ;
    - un groupe racleur (30), comprenant :

- une paire de supports (32), comportant chacun un siège (34) ;
- une bande (36) s'étendant principalement le long de l'axe de rotation du rouleau d'étirage (20), susceptible de reposer contre la surface du rouleau d'étirage (20), au moins partiellement logée dans lesdits sièges (34), les supports (32) étant supportés de façon oscillante afin d'absorber l'interférence sur la bande des résidus accumulés sur le rouleau d'étirage ;
- une paire de brides (40) fixées au corps de la machine textile, lesdits supports (32) étant respectivement articulés sur la bride (40), à une certaine distance le long de l'axe de rotation du rouleau d'étirage ;

caractérisé en ce que ledit au moins un rouleau d'étirage (20) est couplé à un rouleau de pression (6), et **en ce que** ladite bande (36) est logée dans les sièges (34) desdits supports (32) avec un jeu dans la direction de l'épaisseur à l'intérieur du siège (34).

2. Dispositif de transport (1) selon la revendication 1, dans lequel, en dehors de la liaison produite par la bande (36), les deux ensembles support-bride sont structurellement indépendants.

3. Dispositif de transport (1) selon la revendication 1 ou 2, dans lequel le support (32) peut tourner autour d'un axe incident à un plan perpendiculaire à l'axe de rotation du rouleau.

4. Dispositif de transport (1) selon l'une quelconque des revendications précédentes, comprenant des dispositifs influenceurs susceptibles d'influencer constamment le support (32) de façon à presser celui-ci de telle sorte que la bande (36) soit maintenue contre le rouleau d'étirage.

5. Dispositif de transport (1) selon la revendication 4, dans lequel les moyens influenceurs comprennent un ressort de torsion, constitué par exemple par un cylindre en un matériau élastique, tel que le polyuréthane.

6. Dispositif de transport (1) selon les revendications 3 et 5, dans lequel le support (32) est articulé sur la bride (40) à l'aide dudit ressort de torsion.

7. Dispositif de transport (1) selon l'une quelconque des revendications précédentes, dans lequel la bande (36) comprend une lèvre (38) faisant saillie à partir du siège (34), susceptible de se déplacer contre le rouleau d'étirage, ladite lèvre étant inclinée dans la direction de rotation du rouleau d'étirage.

8. Dispositif de transport (1) selon l'une quelconque des revendications précédentes, comprenant des dispositifs d'aspiration positionnés sous le rouleau d'étirage (20).

9. Dispositif de transport (1) selon l'une quelconque des revendications précédentes, comprenant un actionneur (6a) susceptible de presser le rouleau de pression (6) vers le rouleau d'étirage (20), et des dispositifs de capteur susceptibles de détecter une action sur le piston d'actionneur qui est contraire à la direction de poussée.

10. Peigneuse comprenant un dispositif de transport (1) réalisé selon l'une quelconque des revendications précédentes.

11. Banc d'étirage comprenant un dispositif de transport (1) réalisé selon l'une quelconque des revendications 1 à 9.

12. Machine à carder comprenant un dispositif de transport (1) réalisé selon l'une quelconque des revendications 1 à 9.

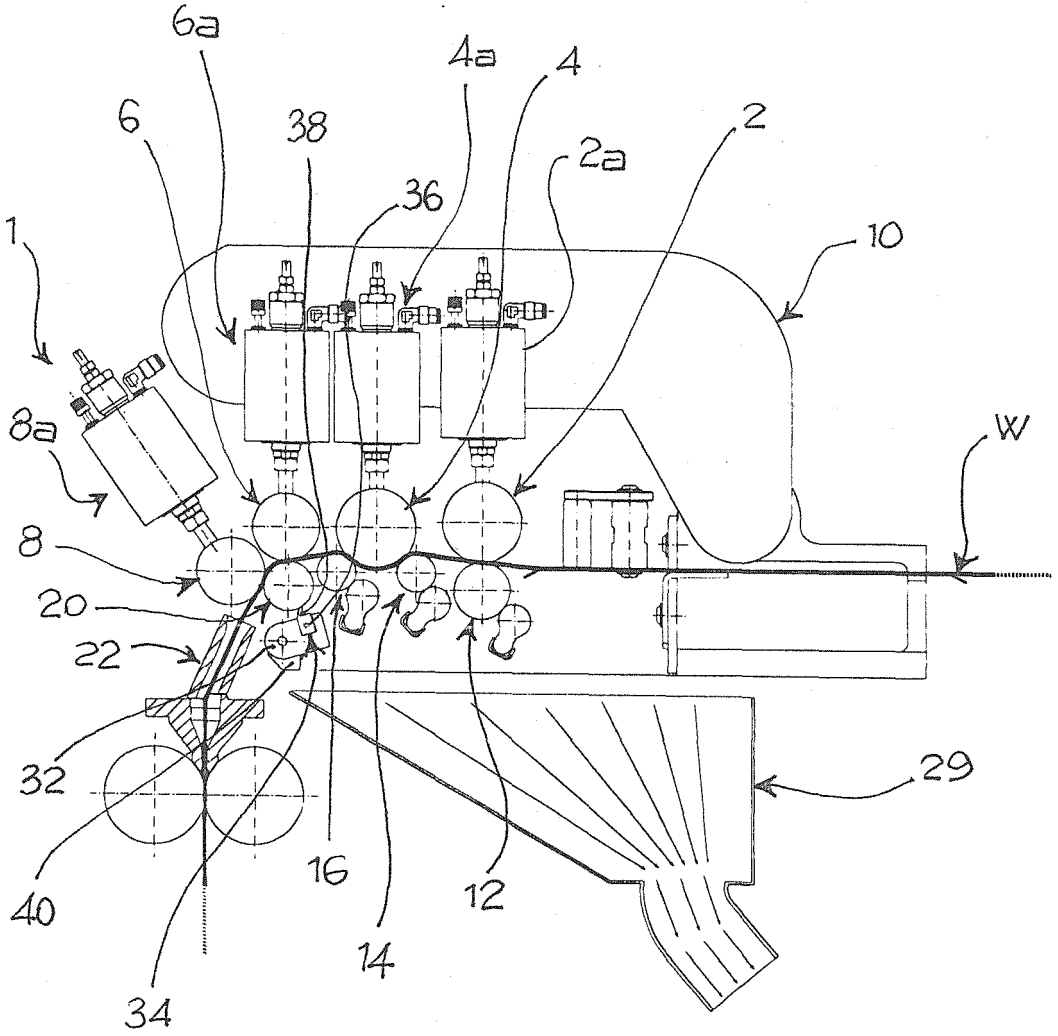

Fig. 1

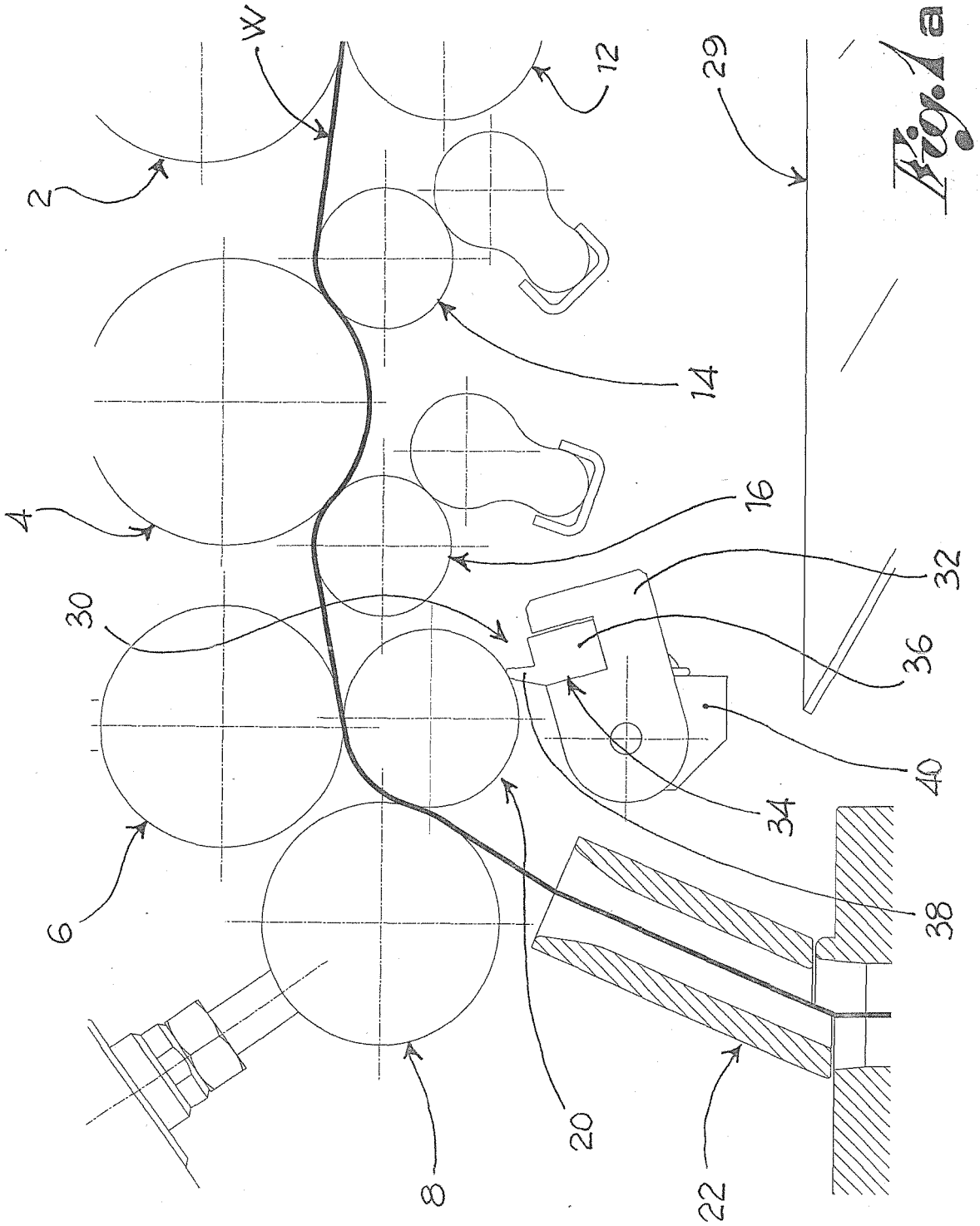

Fig. 1a

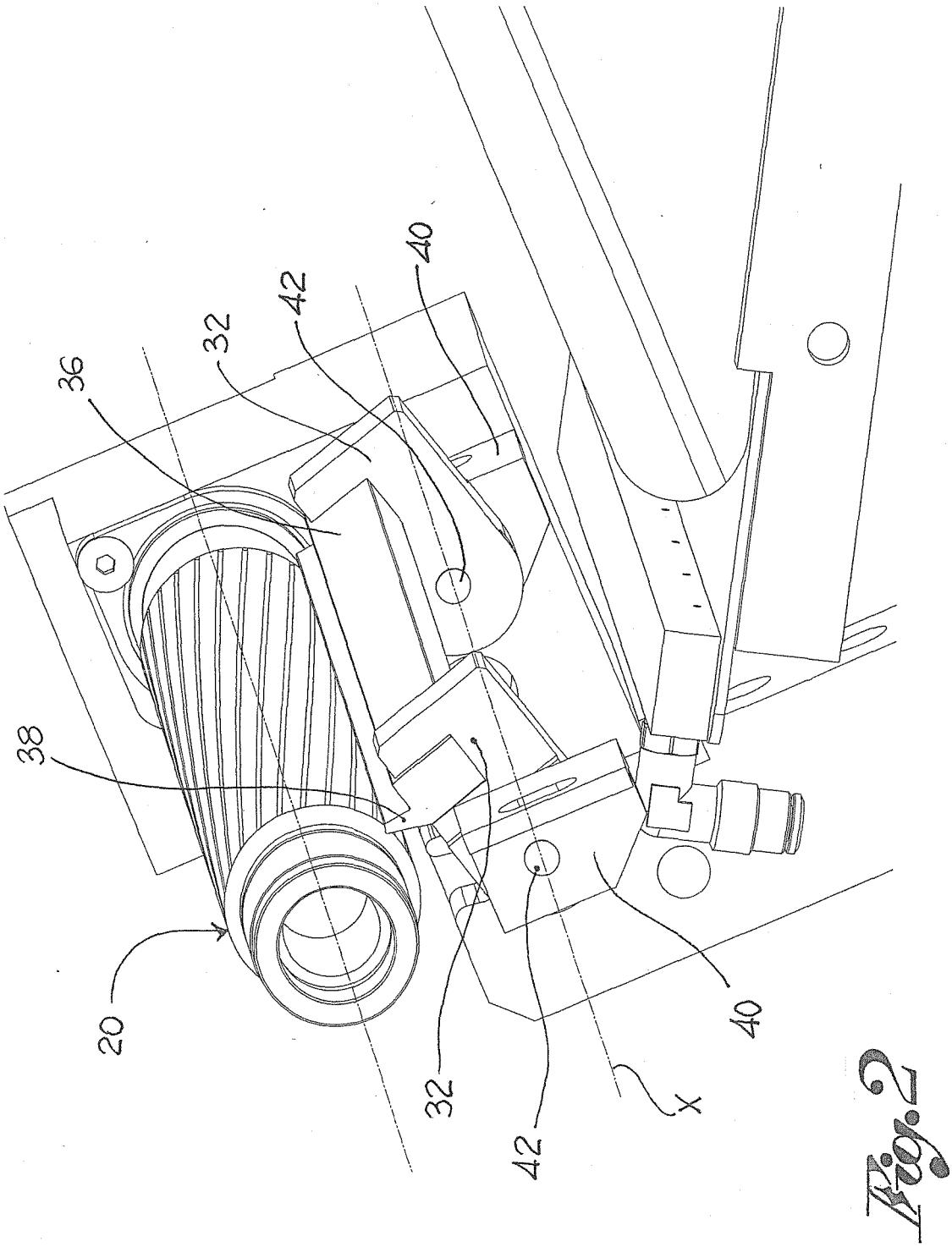

Fig. 2

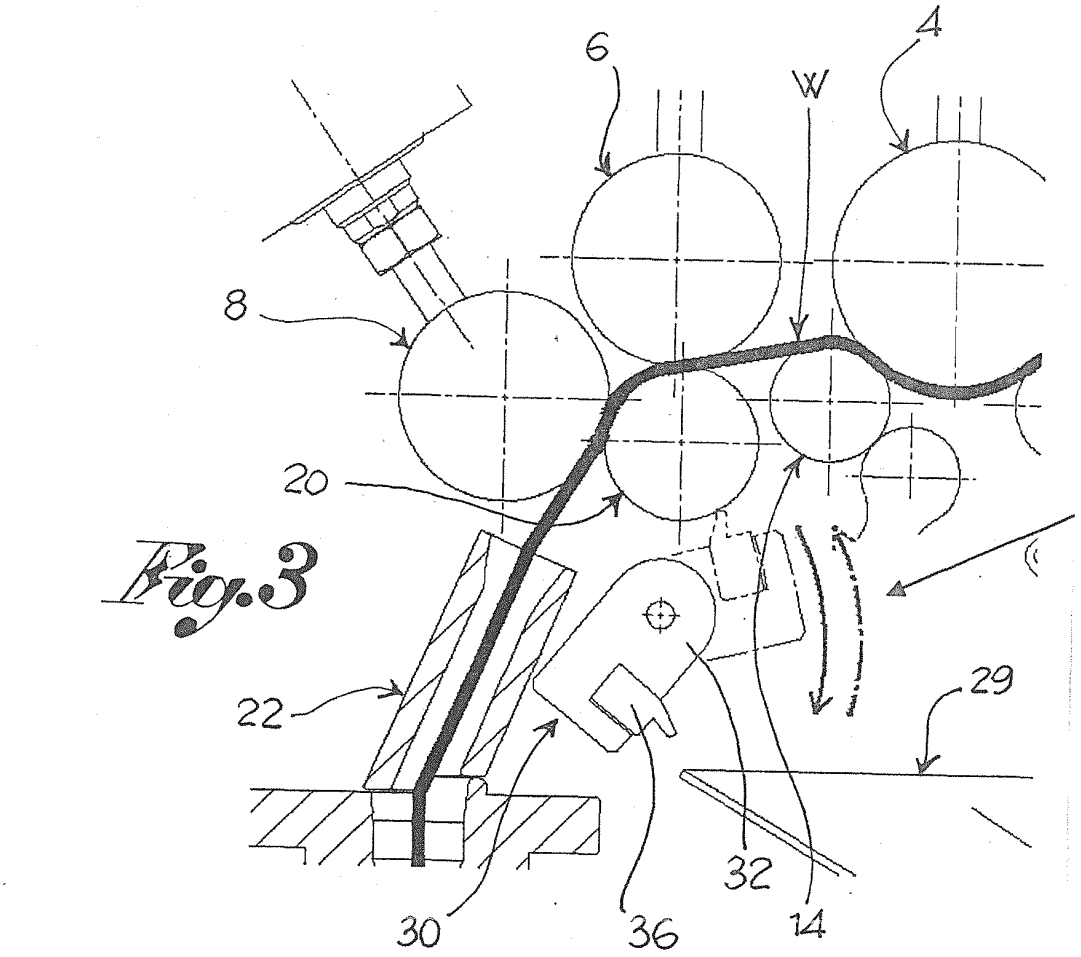

Fig.3

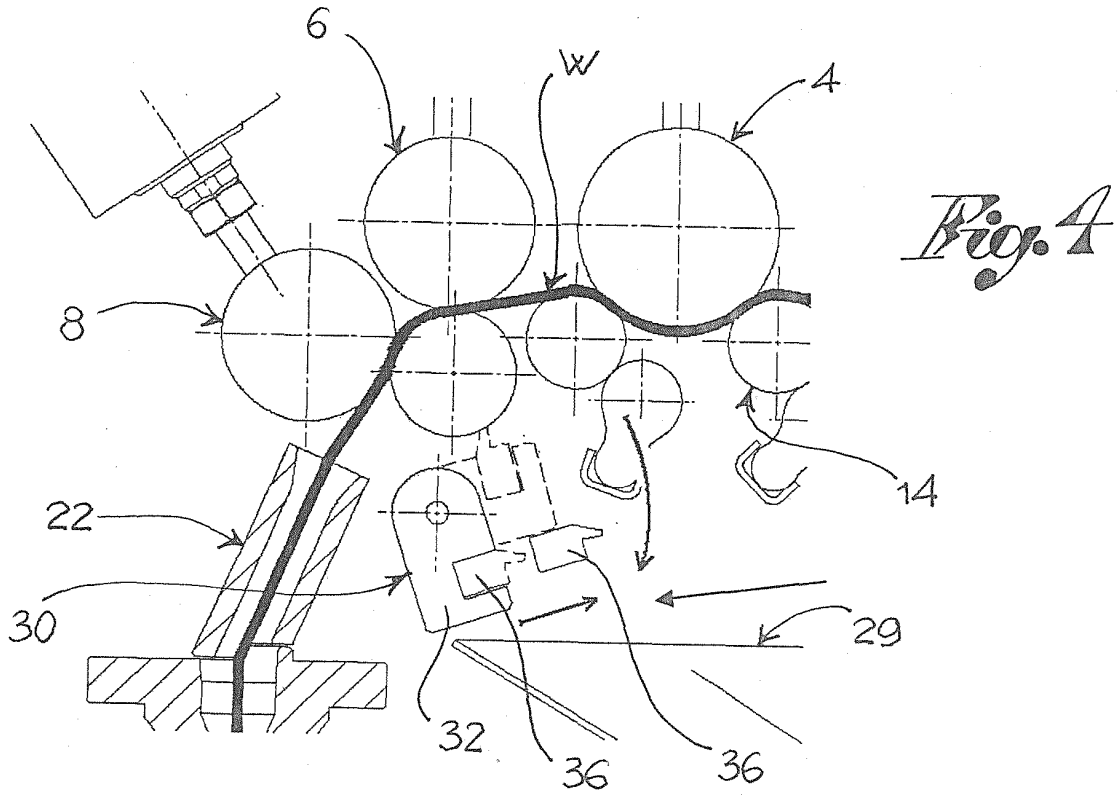

Fig.4

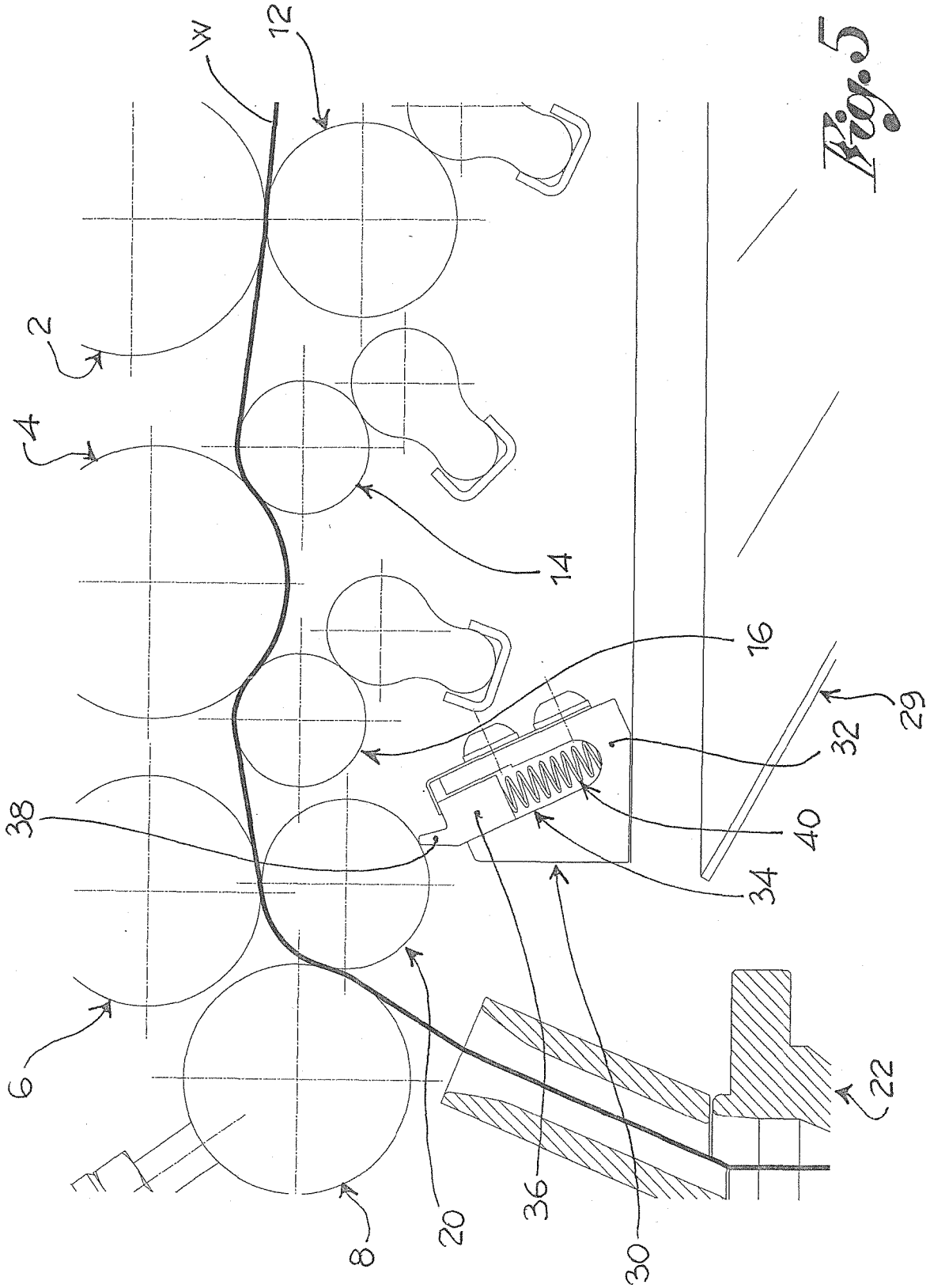

Fig. 5

REFERENCES CITED IN THE DESCRIPTION

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