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(54) **Apparatus for feeding a material in the form of a continuous web to one or more operating machines**

(57) An apparatus for feeding a continuous web material, in particular, a continuous ply of paper, tissue paper or non-woven fabric, comprises a support structure (4) for bearing one or more feeding reels (5, 8, 37) of said continuous web material, and an automatic junction device (11) able to carry out the junction of the web (3a, 3b, 3c) of the corresponding feeding reel (5, 8, 37) which is running out of web, with the web (3a, 3b, 3c) of a full reel (5, 8, 37) without any interruption in the feeding of the web material (2).

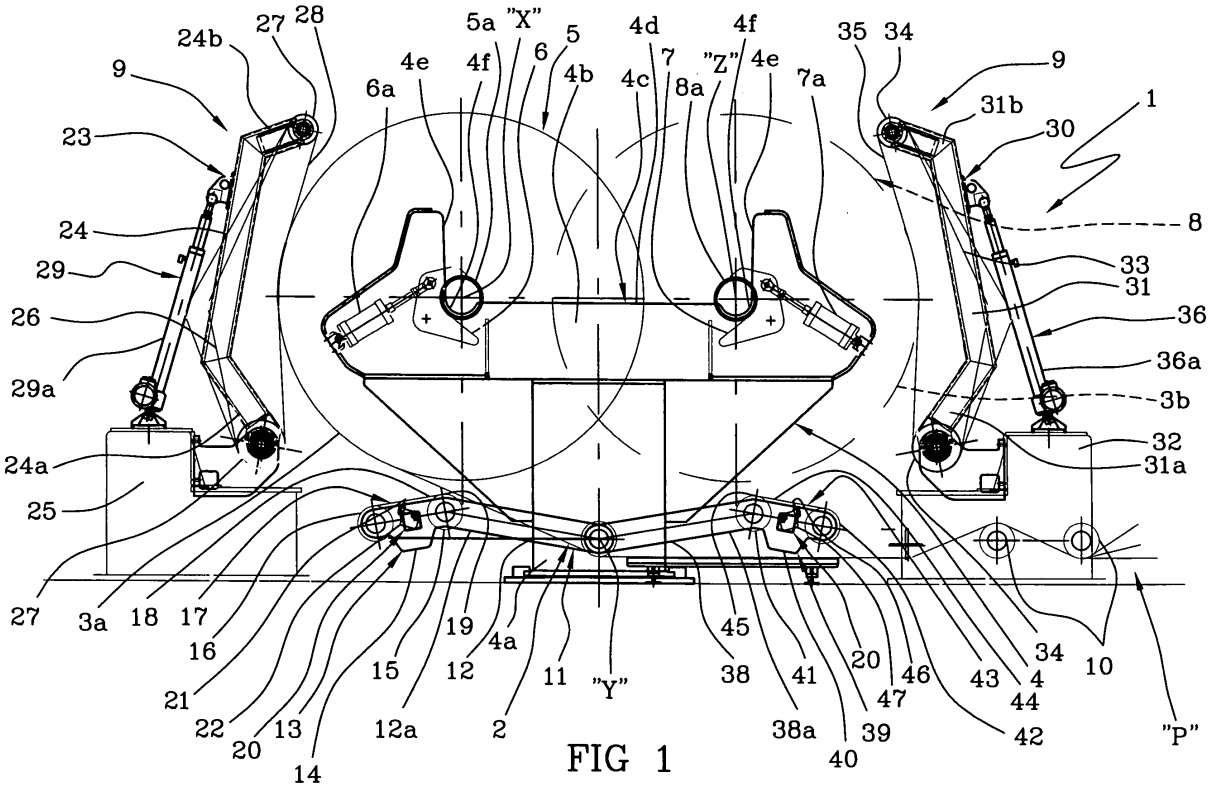


FIG 1

EP 1 870 359 A2

Description

[0001] The present invention refers to an apparatus for feeding a material in the form of a continuous web, in particular a continuous ply of paper, tissue paper or non-woven fabric, to one or more operating machines.

[0002] The present invention is apt for use in the field of paper industry and industrial machines for the production and treatment of paper, tissue paper and the like, or of non-woven fabric and other types of paper.

[0003] It is known that the feeding of tissue paper to operating machines, typically used in the field of paper industry, is carried out by means of at least a feeding apparatus able to unwind a web of paper material from suitable feeding reels disposed on a fitting support structure.

[0004] In particular, the feeding of the web of paper material is normally operated until the respective feeding reel runs out of the same web. Afterwards, the feeding of the web is interrupted to allow the junction thereof with a further web of paper material carried by a replacing reel.

[0005] The web which is reeling off is then brought in contact with an adhesive region of the replacing reel's web so as to join the two webs and to provide a continuity to the operation of paper material feeding.

[0006] The Applicant has observed that the known feeding apparatuses are not without drawbacks and can be improved under many aspects, mainly in relation to the continuity of automation of paper material feeding.

[0007] In particular, the Applicant has found that the apparatuses do not ensure a continuous feeding of said paper material, and require a periodical interruption of their operation to allow the union of the reeling off web with a new web to be fed.

[0008] The object of the present invention is therefore to provide an apparatus for feeding paper material in the form of a continuous web to one or more operating machines, said apparatus being able to overcome the drawbacks of the prior art.

[0009] A further object of the present invention is to provide an apparatus ensuring a continual feeding of paper material without any interruption.

[0010] Yet another object of the present invention is to automate the operations of joining the reeling off web to a replacing web.

[0011] These and other objects, which will appear more clearly by a reading of the following description, are substantially achieved by an apparatus for feeding paper material in the form of a continuous web, in particular, a ply of paper, tissue paper or non-woven fabric, to one or more operating machines, as set forth in the appended claims.

[0012] Further characteristics and advantages will appear more clearly by a reading of the description of a preferred but non-exclusive embodiment of an apparatus for feeding paper material in the form of a continuous web, in particular, a ply of paper, tissue paper or non-woven fabric, to one or more operating machines, according to the present invention.

[0013] The description that follows is to be read with reference to the attached figures given only by an indicative an, thus, non-limiting example. In the drawings:

Fig. 1 is a schematic view of an apparatus for feeding paper material in the form of a continuous web to one or more operating machines, according to the present invention;

Fig. 2 is an enlarged view of a detail of the preceding figure;

Fig. 3 is a schematic view of the apparatus shown in the preceding figures and representing a first operating step in which a reel for feeding a continuous web of paper material is ready to be loaded;

Fig. 4 is a schematic view of the apparatus shown in the preceding figures and representing a second operating step in which the feeding reel is disposed on a support structure;

Fig. 5 is a schematic view of the apparatus shown in the preceding figures and representing a third operating step in which the feeding reel is about to be run out of web and a first feed replacing reel is ready to be loaded;

Fig. 6 is a schematic view of the apparatus shown in the preceding figures and representing a fourth operating step in which the feeding reel is reeling off and the first feeding reel is disposed on the support structure to allow the junction of the web of the latter with the web of the feeding reel;

Fig. 7 is a schematic view of the apparatus shown in the preceding figures and representing a fifth operating step in which the unwinding of the feeding reel has been completed and the support core been removed, and the first feed replacing reel is in the process of unreeling;

Fig. 8 is a schematic view of the apparatus shown in the preceding figures and representing a sixth operating step in which the first feeding reel is running out of web and a second feed replacing reel is ready to be loaded;

Fig. 9 is a schematic view of the apparatus shown in the preceding figures and representing a seventh operating step in which the first feed replacing reel is running out of web and the second feed replacing reel is disposed on the support structure to allow the junction of the web of the latter with the web carried by the first feed replacing reel; and

Fig. 10 is a schematic view of the apparatus shown in the preceding figures and representing an eighth operating step in which the unwinding of the first feed replacing reel has been completed and the support core been removed, and the second replacing reel is in the process of unreeling.

[0014] The attached figures illustrate an apparatus 1 for feeding a paper material 2 in the form of a continuous web, in particular a continuous ply of tissue paper, to one

or more operating machines (not shown).

[0015] The apparatus 1 comprises a support structure 4 for operatively supporting at least one feeding reel 5 having a respective web 3a of paper material 2 wound thereon.

[0016] The support structure 4 comprises a rest base 4a on top of which there is engaged a portion of housing 4b exhibiting a recess 4c defined by at least a substantially horizontal edge 4d and two substantially vertical edges 4e extending from the ends of the horizontal edge 4d.

[0017] The recess 4c also exhibits, between the horizontal edge 4d and each vertical edge 4c, respective rounded edges 4f.

[0018] Again with reference to the attached figures, the support structure 4 has a first seat 6, counter-shaped to a support pivot 5a of the feeding reel 5, so as to receive stably the latter, and a second seat 7 partially counter-shaped to the support 8a of any feed replacing reel 8 like the feeding reel 5.

[0019] The first shaped seat 6 is connected to the portion of housing 4b of support structure 4 via an actuator 6a, preferably of fluid-dynamic type, able to borne, at least partially, the load of a feeding reel 5. The actuator 6a allows the positioning of the respective first shaped seat 6 by adapting the latter to the support pivot 5a of the feeding reel 5 according to a position lined up with a respective rounded edge 4f of recess 4c.

[0020] Likewise, also the second shaped seat 7 is connected to the portion of housing 4b of support structure 4 via an actuator 7a, preferably of fluid-dynamic type which allows the positioning of the respective second shaped seat 6 by adapting the latter to the support pivot 8a of the first feed replacing reel 8 according to a second position lined up with a respective rounded edge 4f of recess 4c.

[0021] The apparatus 1 further comprises driving means 9 operatively associated with the support structure 4 to drive into rotation at least the feeding reel 5 about a respective axis of rotation "X" coincident with the longitudinal axis of the relevant support pivot 5a. The rotation of the feeding reel 5 causes the unreeling of the respective web 3a along a feeding path "P" defined by one or more rollers 10 operatively disposed in proximity of the rest base 4a of support structure 4.

[0022] Advantageously, the apparatus 1 also comprises an automatic junction device 11 operatively associated with the support structure 4 to join the web 3a of the feeding reel 5 to a web 3b of the first feed replacing reel 8 disposed in correspondence of the second shaped seat 7 when the feeding reel 5 is running out of web (Fig. 6).

[0023] Preferably, the automatic junction device 11 is able to join the web 3a of the feeding reel 5 to the web 3b of the first feed replacing reel 8 by suitable adhesive junction means (not shown in the attached figures).

[0024] In particular, the junction adhesive means are advantageously provided on the outer face of each web 3a, 3b of any new feeding reel 5, 8 to be used to feed the paper material 2 to the operating machines.

[0025] Again with reference to the attached figures, the automatic junction device 11 exhibits a first application arm 12 movable between a preset non-operative position (Figs. 1, 3-5, 7-10) and an operative position (Fig. 6) in which it intercepts the web 3a of the feeding reel 5 and determines the contact between the latter with the web 3b of the feed replacing reel 8, preferably in correspondence of the adhesive means borne by the first feed replacing reel 8.

[0026] The first application arm 12 is rotatively movable between the non-operative position and the operative position, about a hinge axis "Y" located in correspondence of the rest base 4a of the support structure 4.

[0027] On the opposite side of the hinge axis "Y", the first application arm 12 exhibits a free end 12a provided with a first application member 13 that can be made to act directly on the web 3a of feeding reel 5, when the first application arm 12 is in the operative position, to join the web 3a to the web 3b of the first feed replacing reel 8.

[0028] As visible in the attached figures, the first application member 13 comprises a frame 14 developing along a major direction which is inclined relative to the development of the first application arm 12. The first application member 13 comprises a first roller 15 rotatively engaged on the frame 14 in correspondence of the free end 12a of the first application arm 12. The first application member 13 comprises a second roller 16 rotatively engaged on the frame 14 on the side opposite to the first roller.

[0029] The apparatus 1 comprises cutting means 20 operating in correspondence of the feeding reel 5 to cut the web 3a of the latter at a preset region. In particular, the cutting means 20 comprise a first cutting blade 21 operatively associated with the junction device 11 of the first application arm 12 in order to cut the web 3a of the feeding reel 5 between the latter and the first feed replacing reel 8.

[0030] Preferably, as can be seen in Fig. 2, the first cutting blade 21 is engaged to the frame 14 of the first application member 13 via a revolving structure 22 so as to result movable between a retracted position in which it is included in the overall dimensions of the frame 14, and a cutting position in which it protrudes therefrom, preferably between the first and second rollers 15, 16.

[0031] To drive the feeding reel 5 into rotation, the above said driving means 9 are provided with a first driving unit 23 externally operating on the web 3a of said reel.

[0032] In particular, the first driving unit 23 comprises a first bearing arm 24 having a first end 24a hinged to a first bedplate 25 and a second free end 24b opposite to the first end 24a. The first bearing arm 24 has preferably a C-like development whose concavity is made to face the support structure 4. In this way, the first bearing arm 24 is able to encircle at least partially a respective feeding reel 5 when the latter is in the course of unreeling.

[0033] The first driving unit 23 comprises also a first drive belt 26 wound around at least two pulleys 27 rota-

tively engaged to the first bearing arm 24, each of which being in correspondence of a respective end 24a, 24 of said arm.

[0034] As shown in the attached figures, the first drive belt 26 exhibits, between the respective pulleys 27, an active length 28 facing the feeding reel 5 to act directly onto the latter.

[0035] The first driving unit 23 is further provided with a first drive member (not shown as being known in the art) operatively associated with at least one of pulleys 24 of the first bearing arm 24 in order to move the first drive belt 26 along a path defined by the respective pulleys 27.

[0036] Advantageously, the first driving unit 23 exhibits one or more tensioning means (not shown) by which it is possible to adjust the tension of the first drive belt 26.

[0037] The first driving unit 23 further comprises first pressing means 29, preferably a fluid-dynamic actuator 29a, interposed between the first bedplate 25 and the first bearing arm 24 to keep the first drive belt externally pressed constantly against the web 3a of the feeding reel 5.

[0038] The driving means 9 are operative also on the first feed replacing reel 8 to drive the latter into motion about a respective axis of rotation "Z" substantially parallel to the axis of rotation "X" of the feeding reel 5.

[0039] In particular, the driving means 9 are provided with a second driving unit 30 operating externally onto the web 3b of the first feed replacing reel 8 or of any feeding reel disposed in correspondence of the second shaped seat 7 of the support structure 4.

[0040] The second driving unit 30 comprises a second bearing arm 31 having a first end 21a hinged to a second bedplate 32, and a second free end 31b opposite to the first end 31a. The second bearing arm 31 has preferably a C-like development whose concavity is made to face the concavity of the first bearing arm 24. In this way, the second bearing arm 31 is able to encircle at least partially a respective feeding reel 8 when the latter is in the course of unreeling.

[0041] The second driving unit 30 further comprises a second drive belt 33 wound around at least two pulleys 34 rotatively engaged to the second bearing arm 31, each of which being in correspondence of a respective end 31a, 31b of the latter.

[0042] As shown in the attached figures, the second drive belt 33 exhibits, between the respective pulleys 34, an active length 28 facing the first feed replacing reel 8 to act directly onto the latter.

[0043] The second driving unit 30 is further provided with a second drive member (not shown as being known in the art) operatively associated with at least one of pulleys 34 of the second bearing arm 31 in order to move the second drive belt 33 along a path defined by the same pulleys 34.

[0044] The second handling unit 30 exhibits as well one or more tensioning means (not shown) by which it is possible to adjust the tension of the second drive belt 33.

[0045] The second handling unit 30 further comprises second pressing means 36, preferably a fluid-dynamic actuator 36a, interposed between the second bedplate 32 and the second bearing arm 31 to keep the second drive belt externally pressed constantly against the web 3b of the first feed replacing reel 8.

[0046] It is stressed that the belt system for moving the reels is given as a preferred example and that different systems can also be used, also in combination to each other, such as a motor acting directly on the support pivot, or a contact roller of suitable diameter in place of the belts, or a different driving system for the two reels.

[0047] To allow for the union of web 3b of the first feed replacing reel 8 to a web of a second feed replacing reel 37 disposed in correspondence of the first shaped seat 6 and in place of the feeding reel run out of web, the above said automatic junction device 11 also exhibits a second application arm 38.

[0048] The second application arm 38 is movable, preferably rotatively around the hinge axis "Y", between a preset non-operative position (Figs. 1, 3-8 and 9) and an operative position (Fig. 9) in which it intercepts the web 3b of the first feed replacing reel 8 and determines the contact of the latter with the web 3c of the second feed replacing reel 37.

[0049] As shown in the attached figures, the second application arm 38 develops from the hinge axis "Y" on the side opposite to the first application arm 12.

[0050] On the side opposite to the hinge axis "Y", the second application arm 38 exhibits a free end 38a provided with a second application member 39 that can be made to act directly onto the web 3b of the first feed replacing reel 8 in order to join the latter to the web 3c of the second feed replacing reel 37.

[0051] The second application member 39 comprises a frame 40 developing along a major direction which is inclined relative to the development of the second application arm 38. The second application member 39 comprises a first pulley 41 rotatively engaged on the frame 40 in correspondence of the free end 38a of the second application arm 38, and a second pulley 42 rotatively engaged on the frame 40 on the side opposite to the first pulley 41.

[0052] Wound around the first and second pulleys 41, 42 is a respective application belt 43 by which the second application member 39 is able to join the web 3b of the first feed replacing reel 8 to the web 3c of the second feed replacing reel 37.

[0053] The application belt 43 of the second application member 39 exhibits a matching length 44 defined between the first and second pulleys 41, 42 and so predisposed as to adhere to a length of web 3b of the first feed replacing reel 8 during the unreeling of the latter. The application belt 43 has also an active length 45 located over the first pulley 41, in correspondence of which the web 3b of the first feed replacing reel 8 and the web 3c of the second feed replacing reel 37 adhere one onto the other when the second application arm 38 is in the

operative position (Fig. 9).

[0054] The above cited cutting means 20 comprise a second blade 46 operatively associated with the second application member 39 to cut the web 3b of the first feed replacing reel 8 between the latter and the second feed replacing reel 37.

[0055] Preferably, the second cutting blade 46 is engaged to the frame 40 of the second application member 39 via a revolving structure 47 so as to result movable between a retracted position in which it is included in the overall dimensions of the frame 40, and a cutting position in which it protrudes therefrom, preferably between the first and second rollers 41, 42.

[0056] The operation of the apparatus above described mainly in relation to its structural configuration is as follows.

[0057] The feeding reel 5 (Fig. 3) is first loaded onto the feeding apparatus 1 with its support pivot 5a disposed on the first shaped seat 6 (Fig. 4). The web 3a, carried by the feeding reel 5, is suitably conveyed through the rollers 10 of the advancement path "P" as far as to enter the station of an operating machine downstream of apparatus 1.

[0058] As shown in Fig. 4, when the feeding reel 5 is loaded, the web 3a of the latter intercepts the first drive belt 26 of the first handling unit 23. In other words, the first drive belt 26 finds itself in direct contact with the outer face of web 3a in correspondence of the first active length 28.

[0059] To ensure a friction sufficient driving the feeding reel 5 during the unreeling operation, the first pressing means 29 push the relevant first bearing support 24 towards the feeding reel 5, thereby pressing the first drive belt 26 against the web 3a of the feeding reel 5.

[0060] The first driving member of the first handling unit 23 drives into rotation one of the rollers 15, 16 of the first bearing arm 24. As a consequence, the first drive belt 26 is dragged along and moves the feeding reel 5 into rotation about the axis "X". The web 3a of the feeding reel move forward along the path "P" by unreeling therefrom (Fig. 5).

[0061] Owing to the action of the first pressing means 29, the first bearing arm 24 rotates in correspondence of the first end 24a so as to keep the drive belt 26 constantly pressed against the web 3a.

[0062] When the feeding reel 5 is about to run out of web (Fig. 5), the first feed replacing reel 8 is loaded onto the apparatus 1 in correspondence of the second shaped seat 7 of support structure 4 (Fig. 6). In this position, the second drive belt 33 is in direct contact with the outer face of web 3b. It is to be pointed out that, before being loaded, the replacing reel is suitably prepared with adhesive means.

[0063] In order to preserve the adhesive junction means disposed on the first feed replacing reel 8, the latter is positioned onto the support structure 4 so that the adhesive means will not enter in contact with the belts which drive the reel into motion or, alternatively, the same adhesive means are covered with non-adhesive material in the contact region.

[0064] Once the first feed replacing reel 8 is loaded, the first application arm 12 is driven into rotation from the non-operative position (Figs. 1, 3-5, 7-10) to the operative position (Fig. 6) thereof. In this position, the roller causes the adhesion of the web 3a of the feeding reel 5, with the junction means being disposed on the outer face of the web 3b of the first feed replacing reel 8.

[0065] Advantageously, the motion of the feeding reel 5, of the first feed replacing reel 8 and of the first application arm 12 are synchronized to ensure the correct junction of webs 3a, 3b.

[0066] Upon completion of the junction, the first cutting blade 21 is moved from the retracted position to the cutting position in correspondence of which it cuts the web 3a carried by the feeding reel 5.

[0067] Afterwards, the feeding reel 5 is removed from the first shaped seat 6 to allow the unwinding of web 3b of the first feed replacing reel 8 (Fig. 7), and the first application arm 12 is re-located to the non-operative position.

[0068] Likewise the procedure above described, when the first feed replacing reel 8 is running out of web (Fig. 8), the second feed replacing reel 37 is loaded onto the support structure 4 (Fig. 9) in correspondence of the first shaped seat 6, with the respective adhesive means being suitably applied.

[0069] The second application arm 38 is then driven into rotation from the non-operative position (Figs. 1, 3-8 and 10) to the operative position (Fig. 9) in correspondence of which the web 3b of the first feed replacing reel 8 is joined to the web 3c of the second feed replacing reel 37.

[0070] Upon completion of the junction, the second cutting blade 46 is moved from the retracted position to the cutting position for cutting the web 3b of the first feed replacing reel 8 and allowing the removal of the latter from the support structure 4 (Fig. 8).

[0071] The unreeling of the second feed replacing reel 37 is performed until the replacement thereof with a further feeding reel.

[0072] The present invention solves the prior art drawbacks and reach the proposed aims.

[0073] First of all, the above described feeding apparatus guarantees a continuous feeding of the above mentioned paper material without interruptions in order to allow joining between webs which are wound around respective feeding reels.

[0074] In particular, the feeding apparatus according to the present invention is able to replace a feeding reel that is running out of web with a full reel by automatically carrying out the junction between the webs of these reels.

Claims

1. Apparatus for feeding paper material in the form of

a continuous web to one or more operating machines, said apparatus comprising:

a support structure for operatively supporting at least one feeding reel (5), said feeding reel (5) having a respective web (3a) wound thereon,
driving means (9) operatively associated with said support structure (4) to drive said feeding reel (5) into rotation about a respective axis of rotation ("X") and unwind the web (3a) from the latter;
cutting means (20) which operate in correspondence of said feeding reel (5) for cutting the web (3a) of the latter at a preset region,

characterized in that it further comprises at least an automatic junction device (11) operatively associated with said support structure (4) to join the web (3a) of said feeding reel (5) to the web (3b) of a first feed replacing reel (8).

2. Apparatus according to claim 1, wherein said automatic connection device (11) unites the web of said feeding reel (5) with the web of the first feed replacing reel (8) by adhesive junction means.

3. Apparatus according to claim 2, wherein said automatic connection device (11) is provided with a first application arm (12) movable between a preset non-operative position and an operative position in which it intercepts the web (3a) of said first feeding reel (5) and determines the contact of the latter with the web (3b) of said first feed replacing reel (8), said adhesive junction means being disposed on the web (3b) of said first feed replacing reel (8) in correspondence of said operative position of said first application arm (12).

4. Apparatus according to claim 2 or 3, wherein said first application arm (12) is rotatively movable about a hinge axis ("Y") preset between the non-operative and operative positions.

5. Apparatus according to claim 4, wherein the hinge axis ("Y") of said first application arm (12) is substantially parallel to the axis of rotation ("X") of said feeding reel (5).

6. Apparatus according to claim 4 or 5, wherein said first application arm (12) exhibits, on the side opposite to the hinge axis ("Y"), a free end (12a) provided with a first application member (13) that can be made to act directly on the web (3a) of said feeding reel (5) to join the same web to the web (3b) of said first feed replacing reel (8).

7. Apparatus according to claim 6, wherein said first application member (13) comprises:

a frame (14) developing along a major direction which is inclined relative to the development of said first application arm (12);
a first roller (15) rotatively engaged on said frame (14) in correspondence of said free end (12a) of said first application arm (12);
a second roller (16) rotatively engaged on said frame (14) on the side opposite to said first roller (15).

8. Apparatus according to claim 6 or 7, wherein said cutting means (11) comprise at least a first cutting blade (21) operatively associated with said first application member (13) for cutting the web (3a) of said feeding reel (5) between the latter and said first feed replacing reel (8).

9. Apparatus according to claim 8, wherein said first cutting blade (21) is movable between a retracted position in which it is spaced from the web (3a) of said feeding reel (5) and a cutting position in which it intercepts and cuts such web (3a).

10. Apparatus according to one or more of the preceding claims, wherein said driving means (9) comprise a first driving unit (23) operating on said feeding reel (5) to drive the latter into rotation about the axis of rotation ("X").

11. Apparatus according to claim 10, wherein said first driving unit (23) comprises:

a first bearing arm (24) exhibiting a first end (24a) hinged to a first bedplate (25) and a second free end (24b) opposite to said first end (24a);
a first drive belt (26) wound around at least two pulleys (27) rotatively engaged to said first bearing arm (24) each of which being in correspondence of a respective end (24a, 24b), said first drive belt (26) exhibiting, between the respective pulleys (27) an active length (28) facing said feeding reel (5) to act directly onto the latter;
a first driving unit operatively associated with at least one of pulleys (27) of the first bearing arm (24) in order to move the first drive belt (26) along a first path defined by the respective pulleys (27);
first pressing means (29) interposed between said first bedplate (25) and said first bearing arm (24) to keep said first drive belt (26) externally pressed constantly against the web (3a) of said feeding reel (5).

12. Apparatus according to one or more of the preceding claims, wherein said feeding reel (5) rotatively engages said support structure (4) by means of a first shaped seat (6) provided on the latter, said support structure (4) exhibiting a second shaped seat (7) for

rotary engagement of said first feed replacing reel (8).

13. Apparatus according to claim 12, wherein said driving means (9) are operative on said first feed replacing reel (8) to drive the latter into rotation about a respective axis of rotation ("Z") substantially parallel to the axis of rotation ("X") of said feeding reel (5).

14. Apparatus according to one or more of the preceding claims, wherein said automatic connection device (11) exhibits a second application arm (38) movable between a non-operative position and an operative position in which it intercepts the web (3b) of said first feed replacing reel (8) and determines the contact of the latter with the web (3c) of a second feed replacing reel (37) provided as a replacement of said feeding reel (5) being run out of web.

15. Apparatus according to claim 14, wherein said second application arm (38) is rotatively movable about the hinge axis ("Y") between the non-operative and operative positions.

16. Apparatus according to claim 15, wherein said second bearing arm (38) extends from said hinge axis ("Y") on the side opposite to said first bearing arm (12).

17. Apparatus according to one or more of the preceding claims 14 to 16, wherein said second application arm (12) exhibits, on the side opposite to the hinge axis ("Y"), a free end (38a) provided with a second application member (39) that can be made to act directly on the web (3b) of said first feed replacing reel (8) to join said web to the web (3c) of said second feed replacing reel (37).

18. Apparatus according to claim 17, wherein said second application member (39) comprises:

a frame (40) developing along a major direction which is inclined relative to the development of said second application arm (12);
a first roller (41) rotatively engaged on said frame (40) in correspondence of said free end (38a) of said first application arm (38);
a second pulley (42) rotatively engaged on said frame (40) on the side opposite to said first pulley (41);
an application belt (43) wound around said first and second pulleys (41, 42).

19. Apparatus according to claim 18, wherein said application belt (43) of said second application member (39) exhibits a matching length (44) defined between said first and second pulleys (41, 42) and so predisposed as to adhere to at least a length of the web (3b) of said first feed replacing reel (8), and an active length (45) located over the first pulley (41), in correspondence of which the web (3b) of said first feed replacing reel (8) and the web (3c) of said second feed replacing reel (37) adhere one onto the other when said second application arm (38) is in the operative position.

20. Apparatus according to claim 18 or 19, wherein said cutting means (20) comprise a second cutting blade (46) operatively associated with said second application member (39) to cut the web (3b) of said first feed replacing reel (8) between the latter and said second feed replacing reel (37).

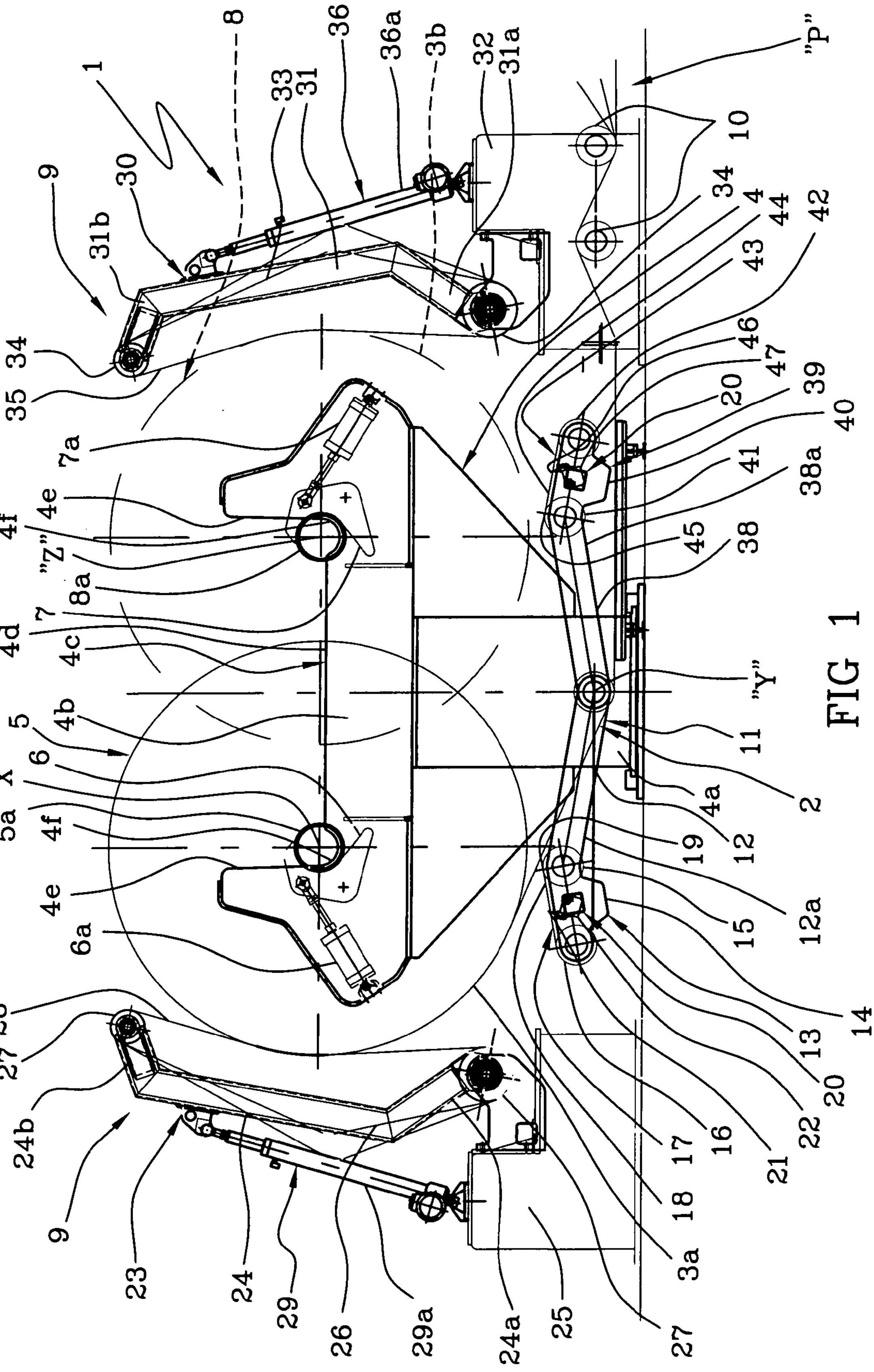
21. Apparatus according to claim 20, wherein said second cutting blade (46) is movable between a retracted position in which it is spaced from said web (3b) of said first feeding reel (8) and a cutting position in which it intercepts and cuts such web (3b).

22. Apparatus according to one or more of claims 12 to 21, wherein said driving means (9) comprise a second driving unit (30) operating on said first feed replacing reel (8) to drive the latter into rotation about the axis of rotation ("Z").

23. Apparatus according to claim 22, wherein said first driving unit (30) comprises:

a second bearing arm (31) exhibiting a first end (31a) hinged to a second bedplate (32) and a second free end (31b) opposite to said first end (31a);
a second drive belt (33) wound around at least two pulleys (34) rotatively engaged to said second bearing arm (31) each of which being in correspondence of a respective end (31a, 31b), said second drive belt (33) exhibiting, between the respective pulleys (34) an active length (35) facing said first feed replacing reel (8) to act directly onto the latter;
a second driving unit operatively associated with at least one of pulleys (34) of said second bearing arm (31) in order to move the said second drive belt (33) along a second path defined by the respective pulleys (34);
second pressing means (36) interposed between said second bedplate (32) and said second bearing arm (31) to keep said second drive belt (33) externally pressed constantly against the web (3b) of said first feed replacing reel (8).

24. Apparatus according to any of the preceding claims, wherein said adhesive junction means are disposed on the outer face of the web (3b, 3c) of each feed replacing reel (8, 37).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31
31b
10
34
4
44
43
42
35
34
46
47
20
39
40
7a
4e
4f
"Z"
8a
7
41
38a
38
45
4d
4c
5
4b
"Y"
11
2
4a
12
19
6
"X"
5a
4f
4e
6a
15
12a
14
13
20
22
21
16
17
18
3a
28
27
24b
9
23
24
29
29a
26
24a
25
27

FIG 1

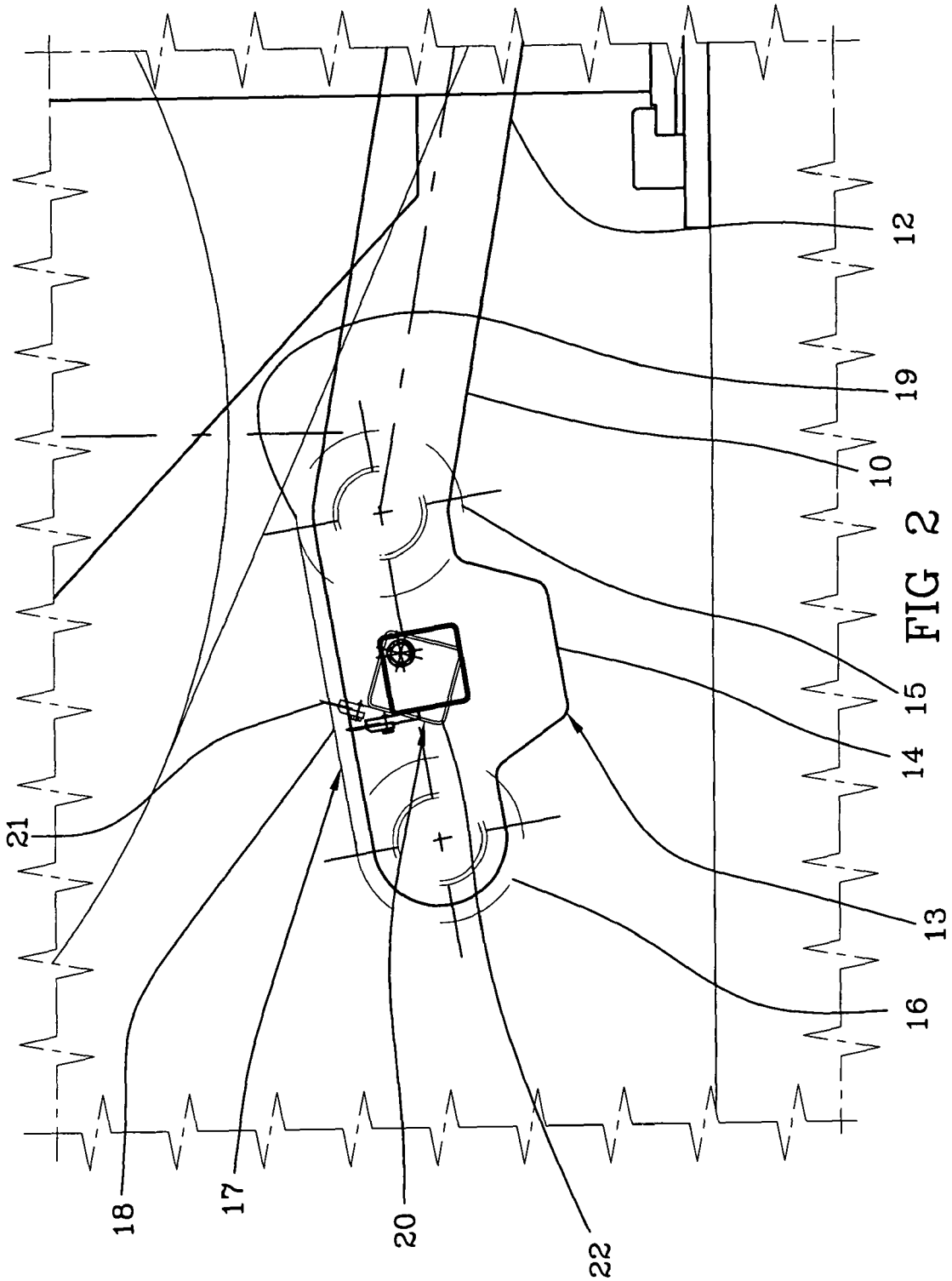

FIG 2

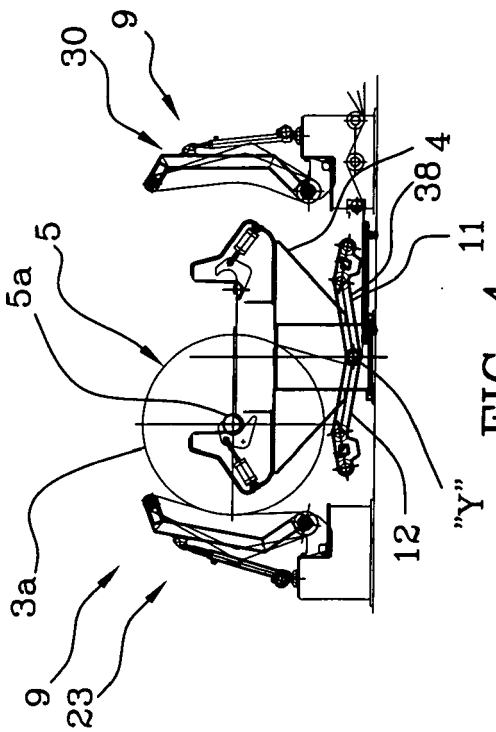

FIG 4

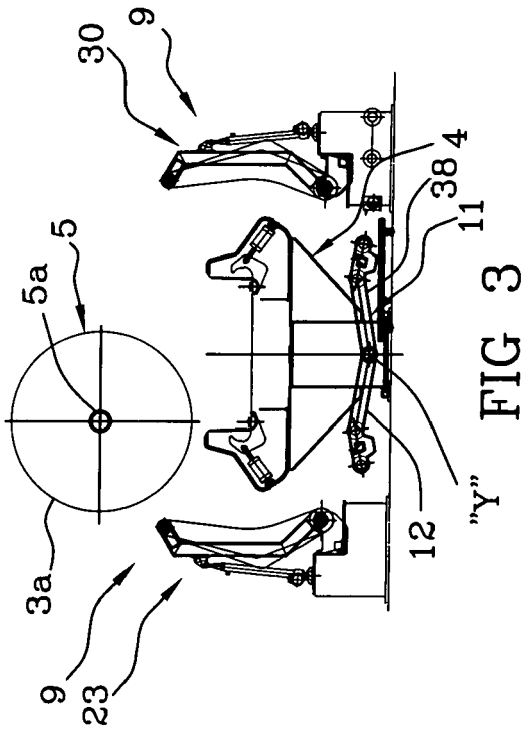

FIG 3

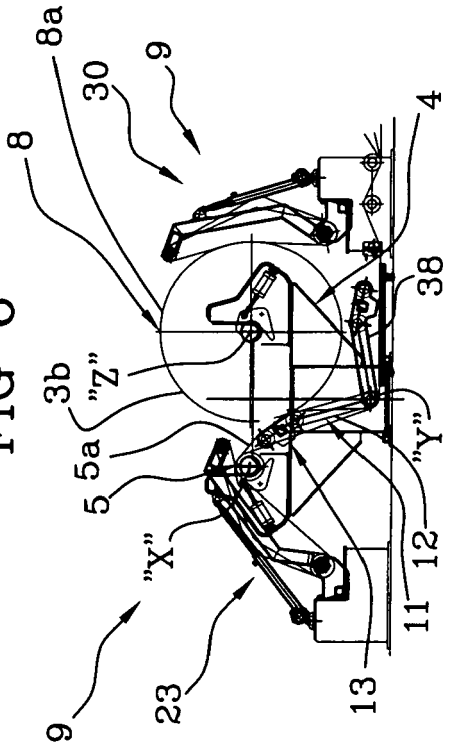

FIG 6

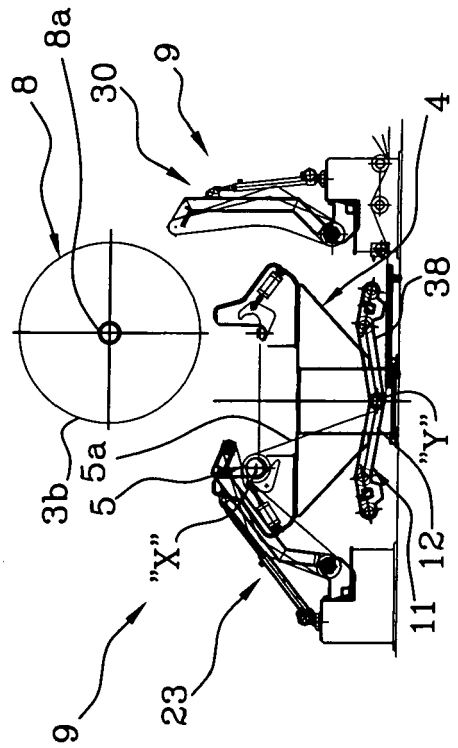

FIG 5

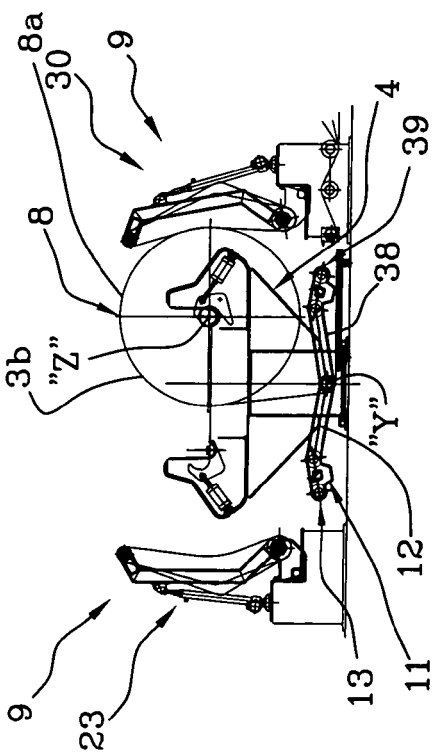

FIG 7

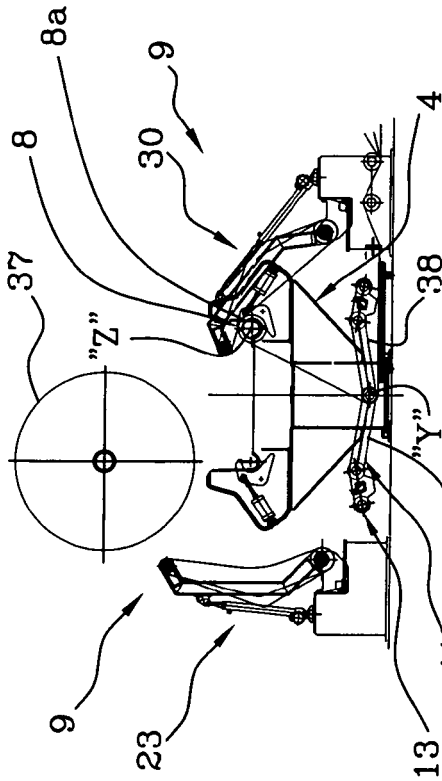

FIG 8

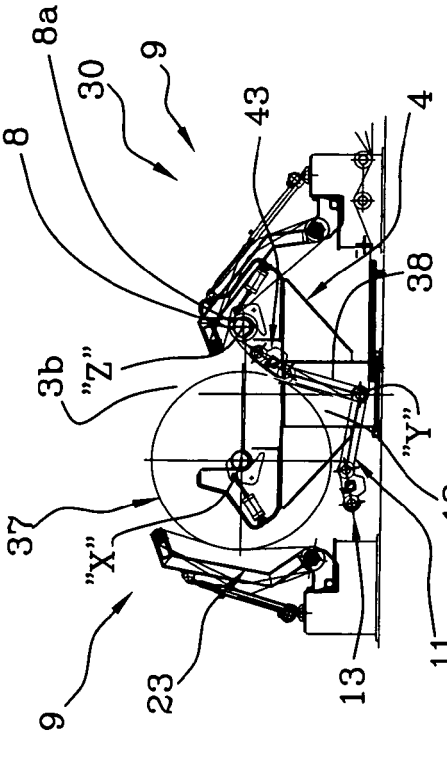

FIG 9

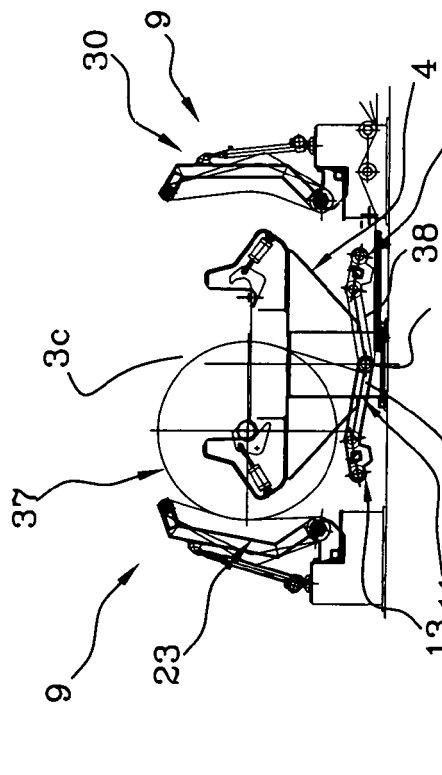

FIG 10