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(54) **Cutting device for a web winder.**

(57) The invention concerns a cutting device for a web winder. The cutting device (10) comprises a frame construction (11) and a cutting blade (16), by means of which cutting blade (16) the web in the reel (20) formed on support of the carrier drums (18,19) can be cut off before new winding is started. The cutting device (10) comprises an actuator (17) and power transfer members (13,14), which are operationally connected with the cutting blade (16) of the cutting device (10) so that the movement of the actuator (17) is fitted to be transferred by the intermediate of said power transfer members (13,14) to the cutting blade (16) so that the cutting blade (16) is fitted to move along a curved path of movement so that the position of the cutting blade (16) in the lower position is substantially more distant from the carrier drum (18) than in the upper position.

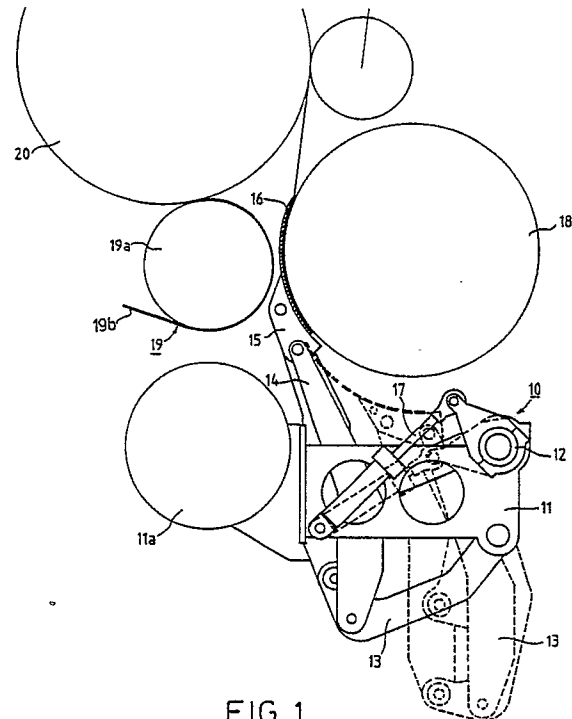


FIG. 1

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The invention concerns a cutting device for a web winder, said device comprising a frame construction and a cutting blade, by means of which cutting blade the web in the reel formed on support of the carrier drums can be cut off before new winding is started.

In respect of the prior art, reference is made to the FI Patent No. 75,788, in which a method and a device for winding of a material web are described. This prior-art carrier-drum winder comprises a rear and a front carrier drum, web cutting means, pushing means for the transfer of a complete reel from the carrier drums, and means for feeding a new reeling spool. The cutting means and the feeding means are operationally connected with the pushing means so as to be displaced to their operation positions by means of a common support arm. One end of the support arm is mounted rotatably at a pivot point placed in the area of the central axis of the rear carrier drum, and the pushing means are attached rotatably to the opposite end of the support arm so that the path of movement of the pushing means is provided by displacing the support arm towards the front carrier drum, the rotation of the pushing means in relation to their support point being accomplished by means of joint operation of the support rolls provided in the pushing means and of the support faces placed at the sides of the winder. In view of supporting and holding the web during the reel exchange, the carrier-drum winder includes a backup holder, which is pushed to project from between the carrier drums and which holds the web against the rear carrier drum. The cutting means include a member for cutting off the web by means of a stroke-like movement of the cutting blade, said movement being directed at the area of the tip of the backup holder, towards the web portion placed between, and held tight by, said tip and the pushing means.

It is a drawback of the web cutting device suggested in the FI Patent No. 75,788 that the solution requires a high number of beams, for which reason the frame construction of the cutting device is complicated and heavy.

In the publication DE 2,920,707, a combined web holder and cutting device is described, which is fitted underneath the carrier-drum winder. This solution requires that a recess must be made into the floor of the production plant for the frame of the cutting device. Thus, this solution requires an abundance of space underneath the carrier-drum winder. The cutting proper of the web takes place by displacing the blade of the cutting device.

The object of the present invention is to provide an improvement over the prior-art web cutting devices.

It is a more specific object of the invention to provide a cutting device which does not require an

installation pit in the floor of the production plant.

A further object of the invention is to provide a cutting device which can be attached to the frame of any carrier-drum winder whatsoever.

The objectives of the invention are achieved by means of a cutting device which is mainly characterized in that the cutting device comprises an actuator and power transfer members, which are operationally connected with the cutting blade of the cutting device so that the movement of the actuator is fitted to be transferred by the intermediate of said power transfer members to the cutting blade so that the cutting blade is fitted to move along a curved path of movement so that the position of the cutting blade in the lower position is substantially more distant from the carrier drum than in the upper position.

By means of the cutting device in accordance with the invention, a number of remarkable advantages are obtained. For the cutting device, it is unnecessary to make an installation pit for the frame construction of the cutting device in the floor of the production plant. The cutting device can be attached to the frame of any carrier-drum winder whatsoever. The cutting blade of the cutting device can be passed into the gap between the carrier rolls either from below, from the front, from the rear, or from above. To the cutting device, it is easily possible to attach other auxiliary devices that are necessary for carrying out the reel exchange. Such auxiliary devices are, for example, a blow device for holding the end of the cut-off web, a web holding device, and a threading member, etc.

The invention will be described in detail with reference to some preferred embodiments of the invention illustrated in the figures in the accompanying drawing, the invention being, however, not supposed to be confined to said embodiments alone.

Figure 1 is a side view of a preferred embodiment of a cutting device in accordance with the invention.

Figure 2 is a side view of a second preferred embodiment of a cutting device in accordance with the invention.

Figure 3 is a side view of a third preferred embodiment of a cutting device in accordance with the invention.

Figure 4 is a side view of a fourth preferred embodiment of a cutting device in accordance with the invention.

Figure 5 is a side view of a fifth preferred embodiment of a cutting device in accordance with the invention.

In the embodiment shown in Fig. 1, the cutting device in accordance with the invention is denoted generally with the reference numeral 10. The cutting device 10 comprises a frame 11, a synchro-

nization tube 12, first arms 13 that are fitted pivotally, second arms 14 that are fitted pivotally, a cutting-blade frame 15 and a cutting blade 16, as well as an actuator 17. The frame tube, which is a part of the frame 11, is denoted with the reference numeral 11a. The frame tube 11a passes in the transverse direction through the carrier-drum winder to the other side. In the embodiment shown in Fig. 1, the cutting device 10 is applied in a carrier-drum winder which comprises a conventional carrier drum 18 as well as a carrier drum 19 consisting of a roll 19a and of another roll, not shown, and of a belt 19b. The reel is denoted with the reference numeral 20.

In the embodiment shown in Fig. 1, the cutting blade 16 of the cutting device 10 is passed into the gap between the carrier drums 18 and 19 from below. The cutting device 10 is attached to the frame construction.

The cutting device 10 shown in Fig. 1 operates as follows. The movement of the actuator 17, e.g. a hydraulic cylinder, acts upon the first arms 13, which are linked with the second arms 14. The pivoting movement of the arms 13 is synchronized by means of the synchronization tube 12. The frame 15 of the cutting blade 16 is linked with the second arms 14. The movement of the actuator 17 is transferred to the frame 15 by the intermediate of the arms 13 and 14, whereby the frame 15 of the cutting blade 16 and the blade 16, which is attached to said frame, obtain a curved movement of rotation in relation to the face of the carrier drum 18. This curved movement of rotation has been chosen so that the centre of rotation of the cutting blade 16 is separate from the centre of rotation of the carrier drum 18. The centre of rotation of the blade 16 can be chosen fully freely, provided that the centre of rotation of the blade 16 does not coincide with the centre of rotation of the carrier drum 18. In Fig. 1, the dashed lines indicate the lower position of the cutting blade 16 and, in a corresponding way, the full lines indicate the upper position. From Fig. 1, it comes out clearly that in the lower position the cutting blade 16 is placed at a certain distance from the face of the carrier drum 18, and in the upper position the cutting blade 16 is placed very close to the face of the carrier drum 18.

The cutting proper of the web takes place either merely because the blade 16 is sharp enough to pass through the web that is placed tensioned on the reel 20. The cutting of the web placed on the reel 20 may also take place so that the reel 20 is pushed by means of a pushing device in itself known, in which case the tensioned web forms a sufficient angle in relation to the cutting blade 16, whereby the web is cut off.

The embodiment shown in Fig. 2 illustrates the

passing of the cutting device 10 in accordance with the invention into the gap between the carrier drums 18 and 19 from the side, i.e., in the present case, from the rear. In this embodiment, the carrier-drum winder comprises conventional carrier drums 18 and 19.

In the embodiment shown in Fig. 3, the passing of the cutting device 10 takes place similarly to Fig. 1, from below. In this embodiment, the carrier-drum winder is composed of conventional carrier drums 18 and 19. Further, in this embodiment, the cutting device 10 is provided with a blow device 21.

The embodiment shown in Fig. 4 is in the other respects similar to the embodiment shown in Fig. 1, but the cutting device 10 shown in Fig. 4 is provided both with a blow device 21 and with a web holder 22.

Fig. 5 shows an embodiment which is in the other respects similar to the embodiment shown in Fig. 1 except that, in the embodiment shown in Fig. 5, the cutting device 10 is provided both with a blow device 21 and with a web threading member 23.

The cutting device 10 in accordance with the invention operates during normal winding and during reel exchange as follows. During normal running, the blade 16 has been run down so that there is a sufficient space underneath the carrier drum 18. To run the new web upon cutting apart of the complete reel 20, the threading member 23 is placed underneath the carrier drum 18, and the cutting blade 16 of the cutting device 10 has been run to its extreme upper position.

In the embodiment shown in Fig. 1, the cutting blade 16 has moved to its extreme upper position through the gap between the carrier drums 18 and 19, in which case it is possible to carry out conventional cutting-off of the web. The cut-off end of the web can be held in its position, e.g., by means of a blow device 21 shown in Figs. 3 and 4. To start new winding, the cutting blade 16 is moved slightly down to permit fitting of a new spool into the gap between the carrier drums 18 and 19. As the reel exchange constitutes prior art, it will not be described in further detail in connection with the invention disclosed in the present application. However, it should be noted that the cutting device 10 in accordance with the invention permits a very smooth and fluent exchange of reel.

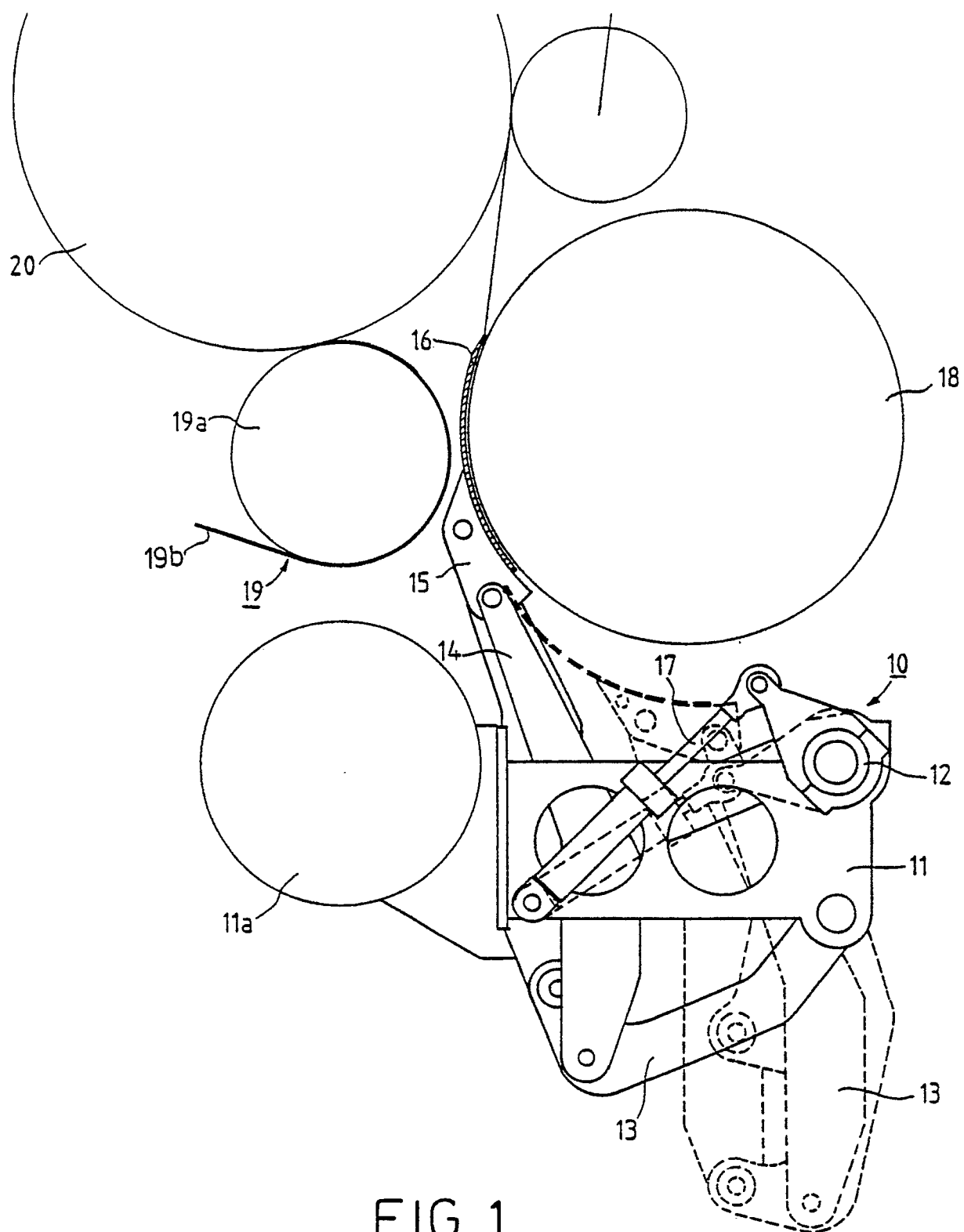
Above, just some preferred embodiments of the invention have been described, and it is obvious for a person skilled in the art that the invention can be modified in a number of different ways within the scope of the inventive idea defined in the accompanying patent claims.

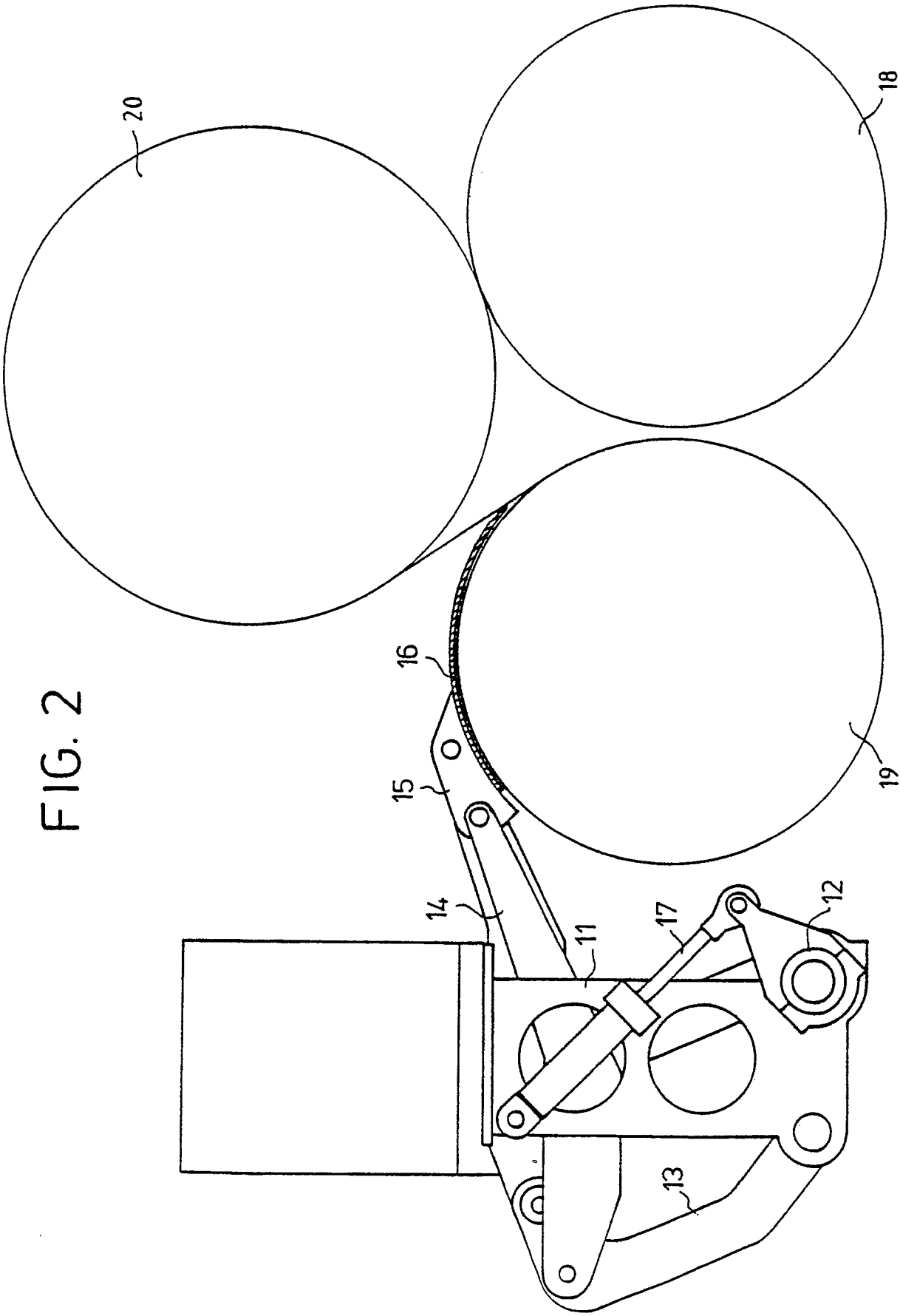
The invention concerns a cutting device for a web winder. The cutting device (10) comprises a frame construction (11) and a cutting blade (16), by

means of which cutting blade (16) the web in the reel (20) formed on support of the carrier drums (18,19) can be cut off before new winding is started. The cutting device (10) comprises an actuator (17) and power transfer members (13,14), which are operationally connected with the cutting blade (16) of the cutting device (10) so that the movement of the actuator (17) is fitted to be transferred by the intermediate of said power transfer members (13,14) to the cutting blade (16) so that the cutting blade (16) is fitted to move along a curved path of movement so that the position of the cutting blade (16) in the lower position is substantially more distant from the carrier drum (18) than in the upper position.

Claims

1. Cutting device for a web winder, said device (10) comprising a frame construction (11) and a cutting blade (16), by means of which cutting blade (16) the web in the reel (20) formed on support of the carrier drums (18,19) can be cut off before new winding is started, **characterized** in that the cutting device (10) comprises an actuator (17) and power transfer members (13,14), which are operationally connected with the cutting blade (16) of the cutting device (10) so that the movement of the actuator (17) is fitted to be transferred by the intermediate of said power transfer members (13,14) to the cutting blade (16) so that the cutting blade (16) is fitted to move along a curved path of movement so that the position of the cutting blade (16) in the lower position is substantially more distant from the carrier drum (18) than in the upper position.
2. Cutting device as claimed in claim 1, **characterized** in that the power transfer members (13,14) consist of first arms (13) and second arms (14), said arms (13,14) being linked with one another pivotally, and that the movements of rotation of the first arms (13) are synchronized by means of a synchronization tube (12).
3. Cutting device as claimed in claim 1 or 2, **characterized** in that the second arms (14) of the power transfer members are linked with the frame construction (15) of the cutting blade (16) pivotally.
4. Cutting device as claimed in any of the claims 1 to 3, **characterized** in that the cutting device (10) is connected with a blow device (21) in view of holding the cut-off end of the web.
5. Cutting device as claimed in any of the claims 1 to 3, **characterized** in that the cutting device (10) is connected with a web holding device (22).
6. Cutting device as claimed in any of the claims 1 to 5, **characterized** in that the cutting device (10) is connected with a threading member (23) for the new web.
7. Cutting device as claimed in any of the claims 1 to 6, **characterized** in that the cutting blade (16) of the cutting device (10) is fitted to move along said curved path of movement into the gap between the carrier drums (18,19) from below.
8. Cutting device as claimed in any of the claims 1 to 6, **characterized** in that the cutting blade (16) of the cutting device (10) is fitted to move along said curved path of movement into the gap between the carrier drums (18,19) from the side.
9. Cutting device as claimed in any of the claims 1 to 6, **characterized** in that the cutting blade (16) of the cutting device (10) is fitted to move along said curved path of movement into the gap between the carrier drums (18,19) from above.
10. Cutting device as claimed in any of the claims 1 to 9, **characterized** in that the actuator (17) is a hydraulic cylinder, that the first arms (13) are articulated arms that are fitted pivotally and that the second pivot arms (14) are articulated arms that are fitted pivotally.





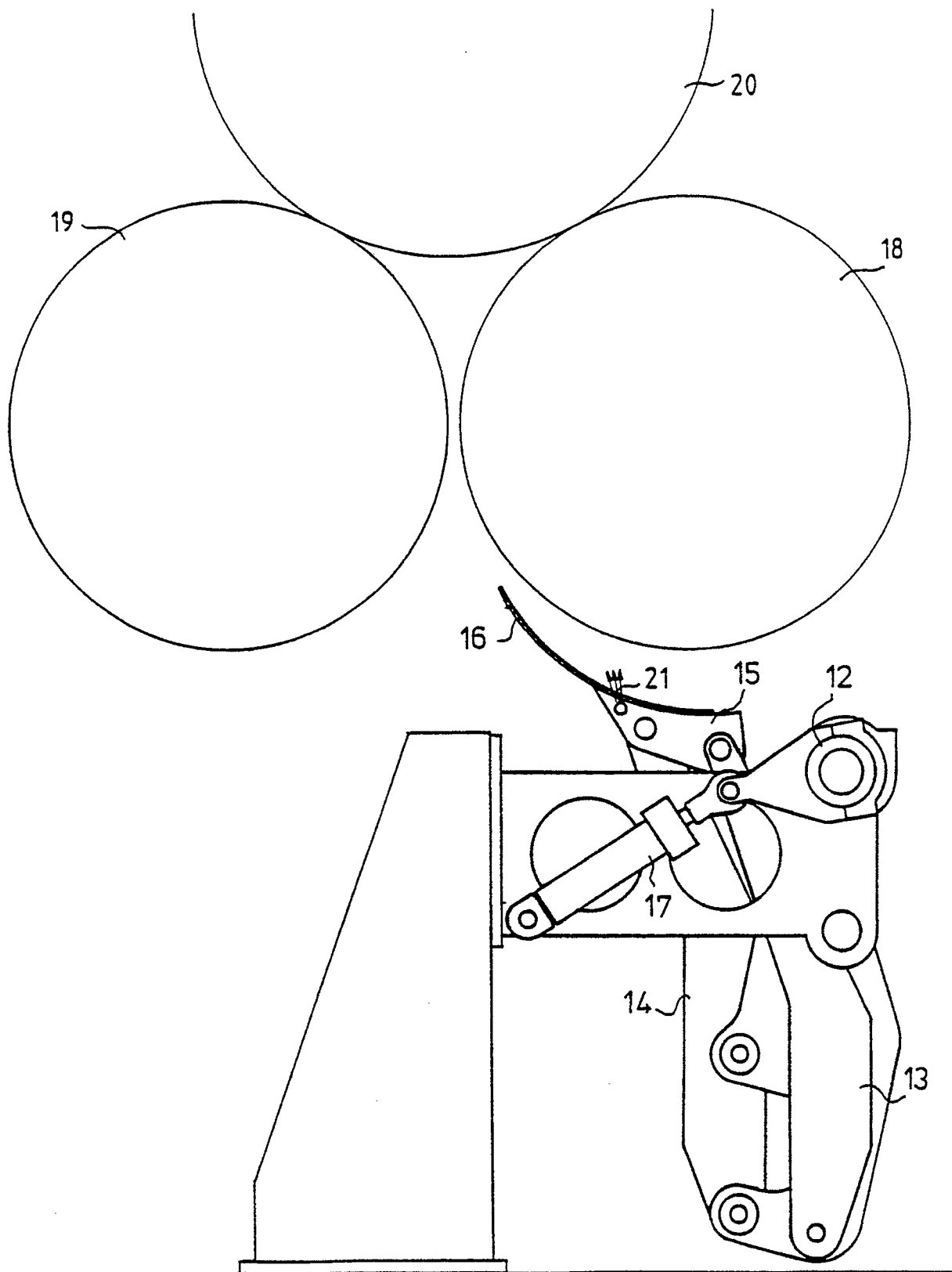


FIG. 3

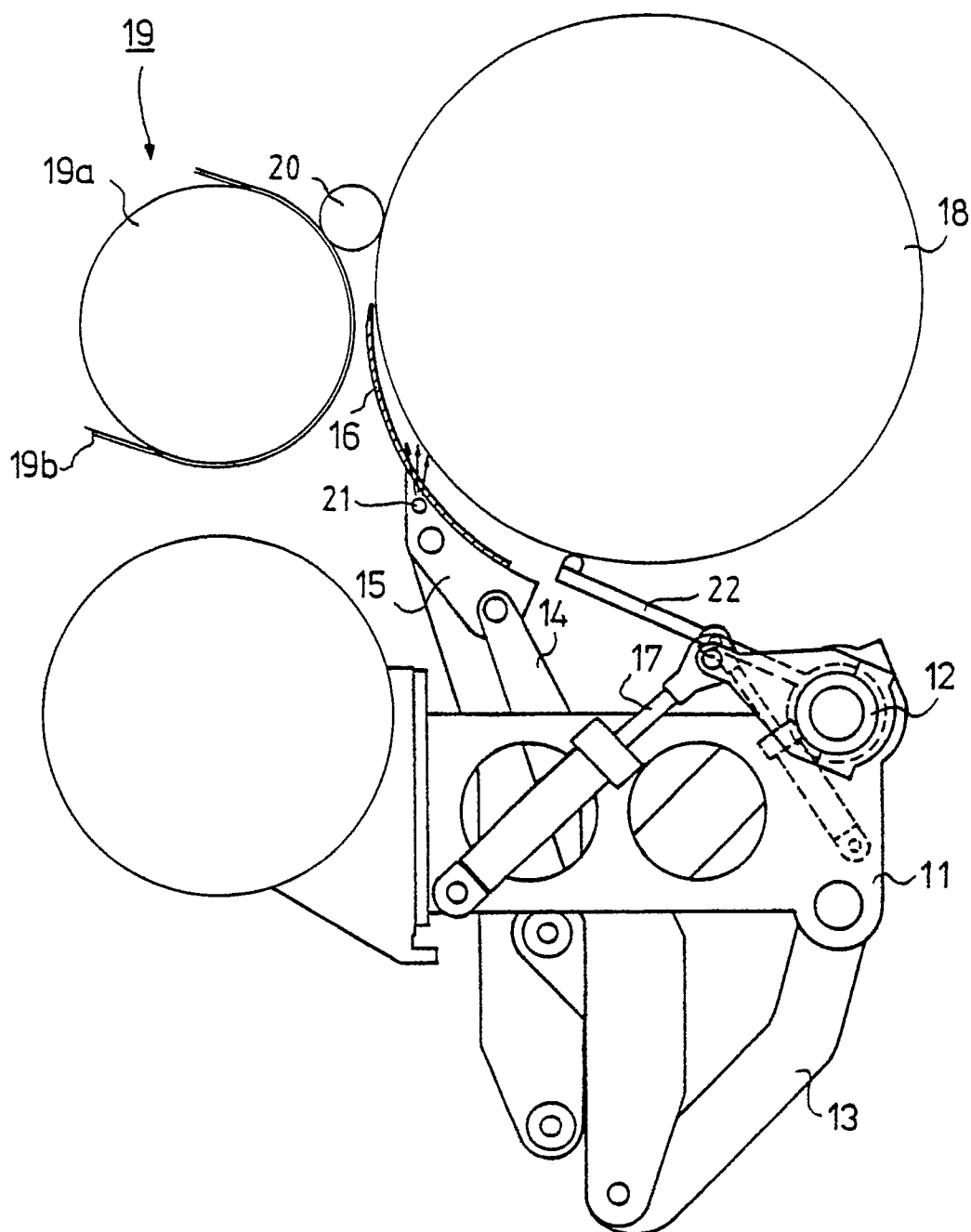


FIG. 4

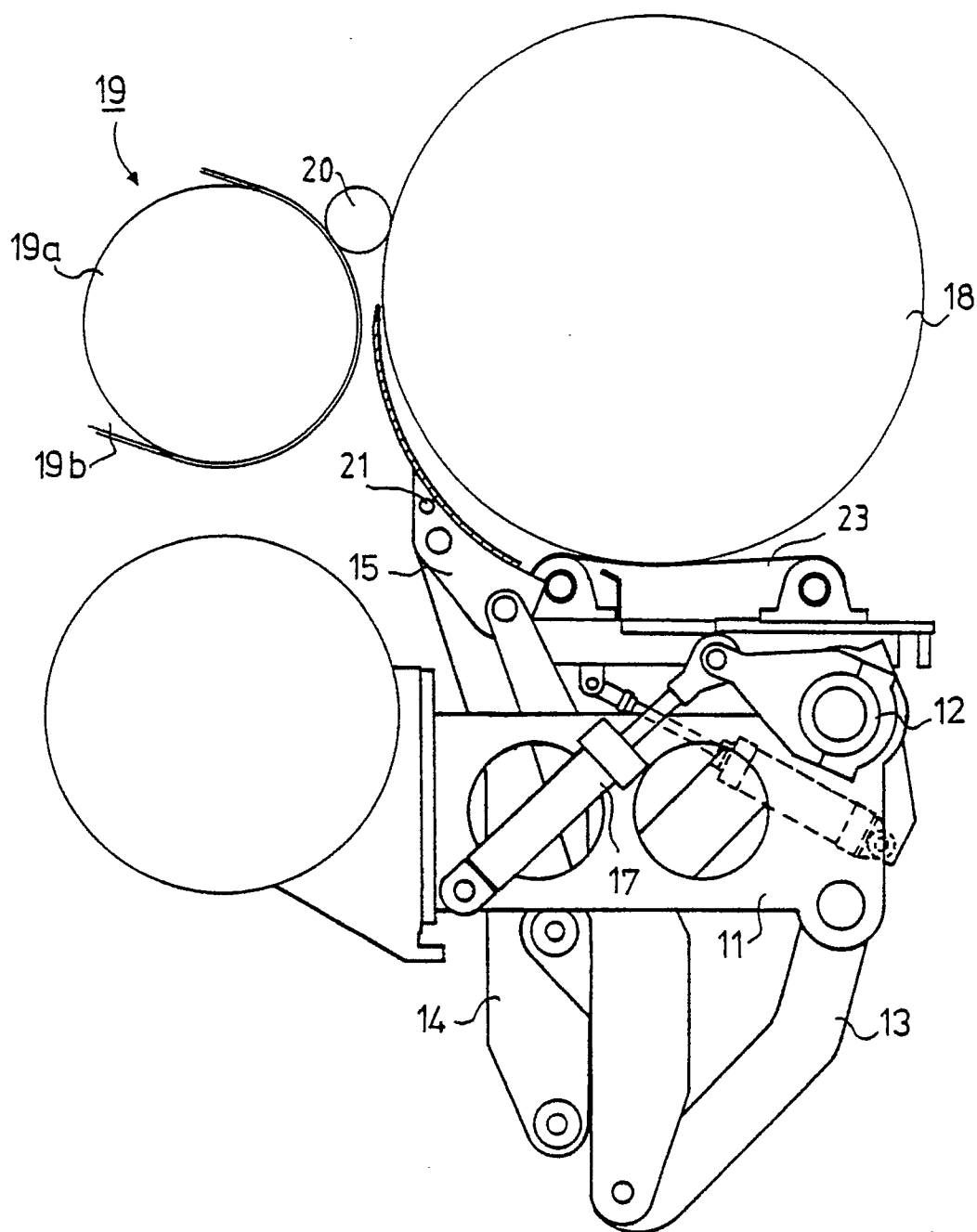


FIG. 5



EUROPEAN SEARCH REPORT

EP 91 10 6933

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
Y	EP-A-0 118 384 (BELOIT CORPORATION) * page 4, line 1 - page 9, line 3; figures * - - -	1,4,5,7-9	B 65 H 19/26
Y	FR-A-2 343 676 (A. AHLSTROM OSAKEYHTIO) * page 3, line 17 - page 5, line 11; figures * - - -	1,4,5,7-9	
Y	FR-A-2 213 897 (MASCHINENFABRIK STAHLKONTOR WESER LENZE KG.) * page 3, line 17 - page 4, column 40; figures * - - -	4	
Y	EP-A-0 363 295 (MONOMATIC S. A.) * column 2, line 29 - column 5, line 5; figures 1-3 * - - - - -	5	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B 65 H
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of search 31 July 91	Examiner DELZOR F.N.M.
CATEGORY OF CITED DOCUMENTS X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons ----- &: member of the same patent family, corresponding document			