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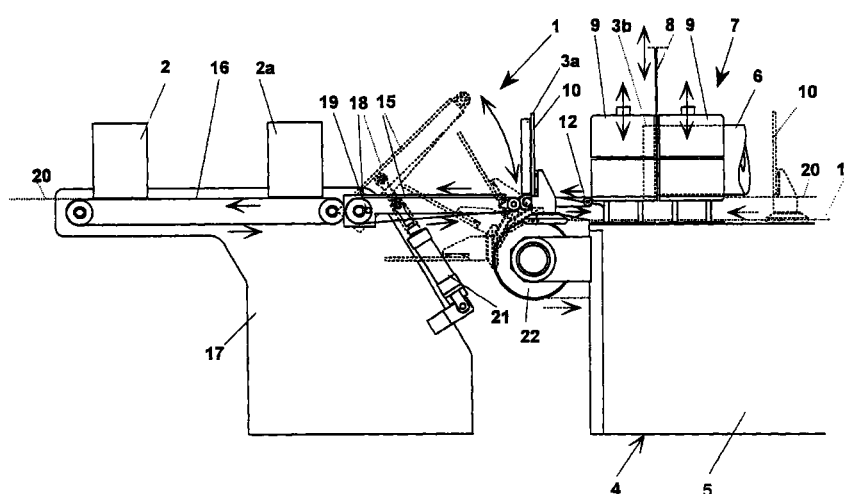
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(54) **Apparatus for removing the trimmed portions in a machine for cutting logs of paper and the like**

(57) The apparatus is arranged on a transversal cutting machine, comprising means of cut and means of conveying the cut portions, for example rolls (2) or stacks obtained from logs (6) of a fixed length. The outlet means comprises a first conveyor (15) followed by a second conveyor (16). The first conveyor can displace from the outlet zone, by rotating or moving away after the passage of the last cut portion (2) of a log (6). In this way a first trimmed portion (3) falls down downstream of the cutting zone brought by the pusher (10) that can easily pass for turning back, and then a second trimmed

portion falls down before that the first cut portion of the following log passes. Just after the passage of the second trimmed portion the first conveyor means (15) move back to such a position that allows regularly the transport of the cut portions (2). In this way it is possible also the use of pushers of large surface. The first conveyor means, preferably, moves away from the outlet zone after a rotation about a fixed hinge (19). Alternatively, they move to the side of the outlet zone.

**Fig. 1**



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## Description

### Field of the invention

[0001] The present invention generally relates to the field of paper converting machines and more precisely it relates to an apparatus for conveying the cut portions, such as rolls or stacks, and for removing the trimmed portions in a transversal cutting machine of logs of paper and the like.

### Brief description of the prior art

[0002] In the production of rolls or stacks of sheets of paper and the like, for example absorbent for wipers or toilet paper, machines are known that work starting from large reels of a web having a large transversal width. From these machines logs of paper are delivered, having length equal to said transversal width of the web, and which are to be cut off into smaller portions, for example rolls of toilet paper, industrial wiping paper, stacks of napkins, etc.

[0003] The transversal cutting machines have just the object of cutting off into rolls or shorter stacks the logs of paper and comprise normally a bench with one or more slides onto which the logs to cut off are placed in turn. A stepped conveying system pushes a log portion beyond the cutting line of a rocking saw. At the cutting zone a clamping device holds the log upstream and downstream of the cutting line. Once cut off, the roll or the stack is carried away by a conveying apparatus provided downstream of the cutting zone.

[0004] The front and back ends of the log are then trimmed and the trimmed portions are taken away along an outlet conveyor.

[0005] The stepped movement of the log is carried out by means of pushers that protrude from a chain, which translates centrally in the slide on which the log lays.

[0006] A first problem of the existing machines is that the pushers have a limited surface and in particular are substantially rectangular strips. This shape is due to the limited clearance at the moment of the passage in the zone of conveying away the rolls or stacks. In fact, the removal is normally carried out by means of parallel belts close to one another, whereby the pushers, which are fastened to a loop chain, in the outlet zone have to pass between two belts and then turn back. The limited surface and the strip-like shape of the pushers have the consequence of a not regular cut of the logs end, in particular when the last roll or stack is cut off from the trimmed portion. In fact, since the trimmed portion is thin, the trimmed portion bends thus preventing the saw from cutting precisely.

[0007] A second problem of the existing machines is that the trimmed portions, at the beginning and end of the log, once cut, often lose their compact shape and become loose. In this way they disturb the outlet zone, where the belts cannot always convey them, and some-

times jam and block the passage of the rolls or stacks.

[0008] In order to avoid this drawback, in some types of rolls cutting-off machines pushing devices are provided that, after that sensors distinguish the trimmed portions from the rolls, push selectively the trimmed portions sideways. Alternatively, "traps" are provided, such as zones of fall of the trimmed portions obtained by distancing some belts so that they allow the passage of the rolls, which have larger size, causing only the trimmed portions to fall. In both these systems, the unevenness of the trimmed portions and their tendency to loosen cause the above-described problems.

[0009] Moreover, the presence of traps for the trimmed portions and the use of spaced belts to allow the passage of the pushers in the outlet zone have the drawbacks of creating points of possible jamming, with problems of stops of the production line and need of continuous control by the operators.

[0010] Finally, systems for conveying rolls are known with clamps or with sucking means that raise from the outlet zone only the rolls, but not the trimmed portions. These systems, however, are not much flexible in case of change of the height of cut and not suitable for all the types of products to cut off.

### Summary of the invention

[0011] It is an object of the present invention to provide an apparatus for conveying and removing the trimmed portions from a transversal cutting machine in which the removal of the trimmed portions is easy, does not disturb the transport of the cut portions and does not allow the trimmed portions to follow the same path of the cut portions before being collected.

[0012] It is a further object of the present invention to provide an apparatus for conveying the cut portions of logs and for removing the trimmed portions thereof that, in case of log conveying means of the type comprising pushers, allows the use of pushers of large surface and that at the same time can easily pass through the outlet zone.

[0013] According to the present invention, an apparatus for conveying cut portions starting from logs of paper material and the like, such as for the production of rolls or stacks, and for removing the trimmed portions is arranged in a transversal cutting machine, which comprises:

- a cutting zone where the logs are cut off into portions;
- pushing means of the logs through the cutting zone;
- outlet means of the cut portions towards an outlet zone downstream of the cutting zone.

[0014] Its characteristic is that in the outlet zone said outlet means can at least in part displace themselves selectively for allowing the deviation of the trimmed portions with respect to the cut portions, whereby the

trimmed portions do not reach the outlet means and can be collected.

**[0015]** Advantageously, in case of pushing means of the logs through the cutting zone by means of pushers, the displacement of the outlet means allows the pas-

sage of the pushers also when they have large surface. **[0016]** Preferably, the outlet means comprises first conveyor means followed by second conveyor means, the first conveyor means moving away from the outlet zone at the moment of the passage of the trimmed portions after having carried the last cut portion of a log, whereby:

- a first trimmed portion falls down downstream of said cutting zone brought by said pushing means that can freely turn back towards a loading zone,
- a second trimmed portion falls down before the passage of the first cut portion of the following log, just after the passage of the second trimmed portion the first conveyor means turning back to such a position that it allows regularly the transport of the further cut portions.

**[0017]** The first conveyor means, preferably, move away from the outlet zone after a rotation about a fixed hinge. Alternatively, they move to the side, above or below the outlet zone.

**[0018]** The move away displacement of the first conveyor means has the advantages of allowing:

- an easy removal of the trimmed portions,
- an easy conveying of the cut portions, rolls or stacks, that, with the method according to the prior art, instead, had problems;
- the adoption of pushers having a larger surface with respect to the prior art.

**[0019]** Advantageously, the pushers comprise a large flat element, for example circular, whereby the logs are pushed by a larger surface thus allowing a cut of the trimmed portions with fewer defects.

#### Brief description of the drawings

**[0020]** Further characteristics and advantages of the apparatus according to the present invention will be made clearer with the following, but not limitative, exemplifying description of several exemplifying embodiments thereof, with reference to the attached drawings wherein:

- figure 1 shows a partial elevational side view of a transversal cutting machine comprising an apparatus according to the present invention for conveying rolls and removing trimmed portions;
- figure 2 shows a top plan view of the transversal cutting machine of figure 1;
- figure 3 shows a partial view from the back of the

conveyance of the rolls by means of circular pushers.

#### Description of the preferred embodiments.

**[0021]** With reference to figures 1 and 2, an apparatus 1 for conveying rolls 2 and removing trimmed portions 3, according to the present invention, is arranged downstream of a transversal cutting machine 4.

**[0022]** The latter comprises a loading and supporting bench 5 of logs 6 to cut into rolls, a cutting zone 7 of the logs 6 by means of a rocking saw 8 and a gripping device 9.

**[0023]** Log 6 is pushed by a pusher 10 brought by a loop chain 11 and, just downstream of the cutting zone, a quick conveyor 12 is provided for carrying the rolls towards the apparatus 1 according to the invention.

**[0024]** Apparatus 1 comprises a first conveyor belt 15 and a second conveyor belt 16 fastened to a base 17.

**[0025]** More precisely, the first conveyor belt 15 is bound to the base 17 by means of a frame 18 pivotally connected about transversal hinges 19, whereby the conveyor belt 15, integrally to frame 18, can move away from the outlet zone by rotating to a position raised with respect to a transport plane 20 of log 6 and of rolls 2.

**[0026]** In such a raised position frame 18, shown in figure 1 with dotted line, is held by a cylinder 21, pivotally connected to base 17.

**[0027]** In use, the transversal cutting machine 4 produces a row of rolls 2 up to the end of log 6. At every cut saw 8 lowers and gripping device 9 clamps log 6. At the last cut, the last roll 2a is separated from a trimmed portion 3a brought by pusher 10. Therefore, saw 8 severs the last roll 2a from trimmed portion 3a by dropping onto the end of the log.

**[0028]** Then quick conveyor 12 carries last roll 2a away, while trimmed portion 3a is brought, as shown in figure 1, towards apparatus 1. As soon as last roll 2a has passed on the first conveyor belt 15, the latter is raised to the position shown with dotted line in figure 1, allowing at the same time the fall of trimmed portion 3a and the passage of pusher 10 that rotates about sprocket 22 following in succession the positions indicated with dotted lines.

**[0029]** At the same time, the transversal cutting machine has started to cut a second log 6, and after the first cut a second trimmed portion 3b is severed and carried by quick conveyor 12. A collector not shown receives trimmed portions 3a, 3b.

**[0030]** Then, before that the first cut portion of the following log 6 passes, just after the passage of the second trimmed portion 3b, the first conveyor 15 is lowered by cylinder 21.

**[0031]** According to the invention, therefore, the above mentioned advantages are achieved disturbing the least possible the rolls to carry away, collecting in a "clean and safe" way the trimmed portions and, allowing the use of a pusher 10 of size large enough to allow a regu-

lar separation of the first or last roll from the trimmed portions by means of saw 8.

[0032] The almost circular shape of pusher 10 is visible in figure 3 that covers almost all the cross section of log 6.

[0033] Notwithstanding reference has been made, in the description and in the drawings, to the cut of logs into rolls, it is clear that the same inventive concept can be applied to the cut of logs of different nature, for example logs of stacked sheets for the production of stacks of napkins, wipers, etc.

[0034] Moreover, the first conveyor belt 15 can also be moved away from the outlet zone in a different way than that shown, for example by rotating it about a hinge longitudinal with respect to the direction of transport of the rolls, or displacing it vertically or horizontally, respectively above or at the side of the outlet zone. These embodiments are not described in detail, because the design differences with respect to what described are obvious to a person skilled in the art.

[0035] The foregoing description of a specific embodiment will so fully reveal the invention according to the conceptual point of view, so that others, by applying current knowledge, will be able to modify and/or adapt for various applications such an embodiment without further research and without parting from the invention, and it is therefore to be understood that such adaptations and modifications will have to be considered as equivalent to the specific embodiment. The means and the materials to realise the different functions described herein could have a different nature without, for this reason, departing from the field of the invention. It is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

## Claims

1. Apparatus for conveying cut portions starting from logs of paper material and the like, such as for the production of rolls (2, 2a) or stacks, and for removing the trimmed portions (3a, 3b) arranged on a transversal cutting machine, said machine comprising:

- a cutting zone (7, 8) where said logs (6) are cut off into portions (2, 2a);
- pushing means (10, 11) of said logs (6) through said cutting zone;
- outlet means of the cut portions in an outlet zone downstream of said cutting zone;

**characterised in that** in the outlet zone said outlet means (1, 15) can, at least in part, displace selectively thus deviating the trimmed portions (3a, 3b) with respect to the cut portions (2, 2a), whereby the trimmed portions do not reach the outlet means (1) and can be collected.

2. Conveying apparatus according to claim 1, wherein said outlet means comprises first (15) and second (16) conveyor means, said first conveyor means being capable of displacing from said outlet zone for allowing the deviation of said trimmed portions (3a, 3b) with respect to said cut portions (2, 2a), whereby said trimmed portions do not reach said second conveyor means.

3. Conveying apparatus according to claim 2, wherein said pushing means comprises pushers (10) having large surface, whereby the logs (6) are steadily pushed thus allowing the cut off of the trimmed portion (3a) from the last roll (2a) with larger support, said first conveyor means (15) moving away from said outlet zone also to allow the passage of said pushers (10) with large surface.

4. Conveying apparatus according to claim 2, wherein said first conveyor means (15) comprises a conveyor belt arranged on a frame (18) that can displace from said outlet zone (1) by rotating about a transversal hinge (19) with respect to the direction of transport (20) of the cut portions (2).

5. Conveying apparatus according to claim 2, wherein said first conveyor means (15) comprises a conveyor belt arranged on a frame that can displace from said outlet zone by rotating about a longitudinal hinges with respect to the direction of transport of the cut portions.

6. Conveying apparatus according to claim 2, wherein said first conveyor means comprises a conveyor belt arranged on a frame that can displace from said outlet zone by moving to the side of the direction of transport of the cut portions.

7. Conveying apparatus according to claim 2, wherein said first conveyor means comprises a conveyor belt arranged on a frame that can displace from said outlet zone by moving vertically with respect to said outlet zone.

8. Method for conveying cut portions starting from logs of paper material and the like, such as for the production of rolls (2, 2a) or stacks, and for removing the trimmed portions (3a, 3b) after a cutting phase, said cutting phase comprising the steps of:

- transport of said logs (6) through a cutting zone (7);
- cut off into portions (2, 2a) of said logs;
- outlet of the cut portions (2, 2a) and of the trimmed portions (3a, 3b) towards an outlet zone (1) downstream of said cutting zone (7);

**characterised in that** it comprises the step

of deviation of said trimmed portions (3a, 3b) with respect to said cut portions (2, 2a) at the end of said outlet step by means of the displacement of conveyor means (15) provided for carrying away said cut portions at the moment of the passage of said trimmed portions. 5

9. Method for conveying cut portions (2, 2a) according to claim 8, wherein said step of transport of said logs is carried out by means of pushers (10) having large surface, said step of deviation of said trimmed portions with respect to said cut portions (2, 2a) allowing also the passage of said pushers (10) having large surface without any interference with said conveyor means (15). 10 15

10. Method for conveying cut portions according to claim 9, wherein said step of deviation is carried out after the outlet of the last cut portion (2a) of each log, the displacement of said conveyor means causing 20

- fall of a first trimmed portion (3a) brought by one of said pushers (10) which can freely pass for turning back to push another log (6), 25
- fall of a second trimmed portion (3b) before that the first cut portion (2) of the following log (6) passes, just after the passage of the second trimmed portion (3b) the conveyor means (15) turning back to such a position that allows a regular transport of the following cut portions (2). 30

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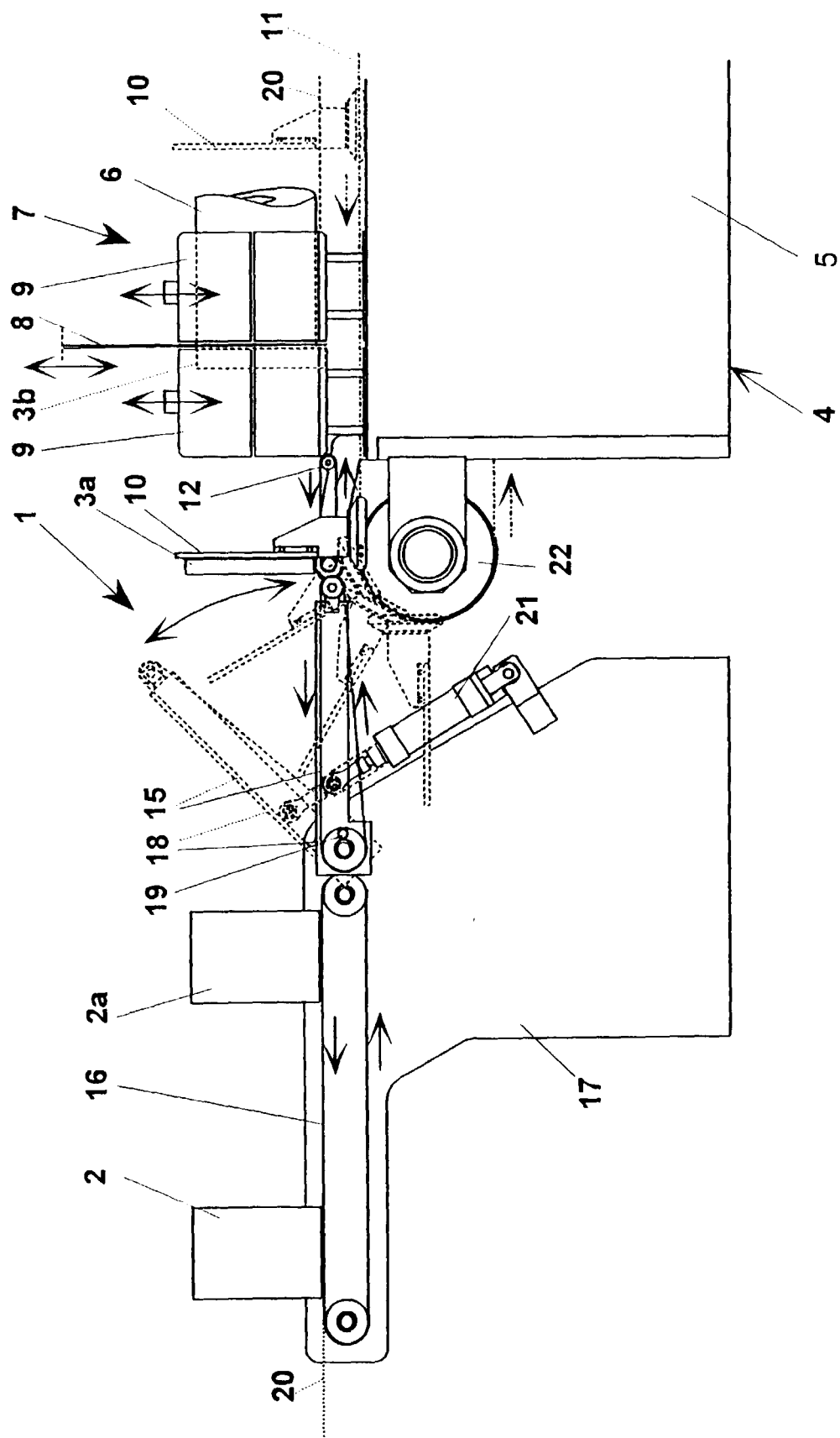
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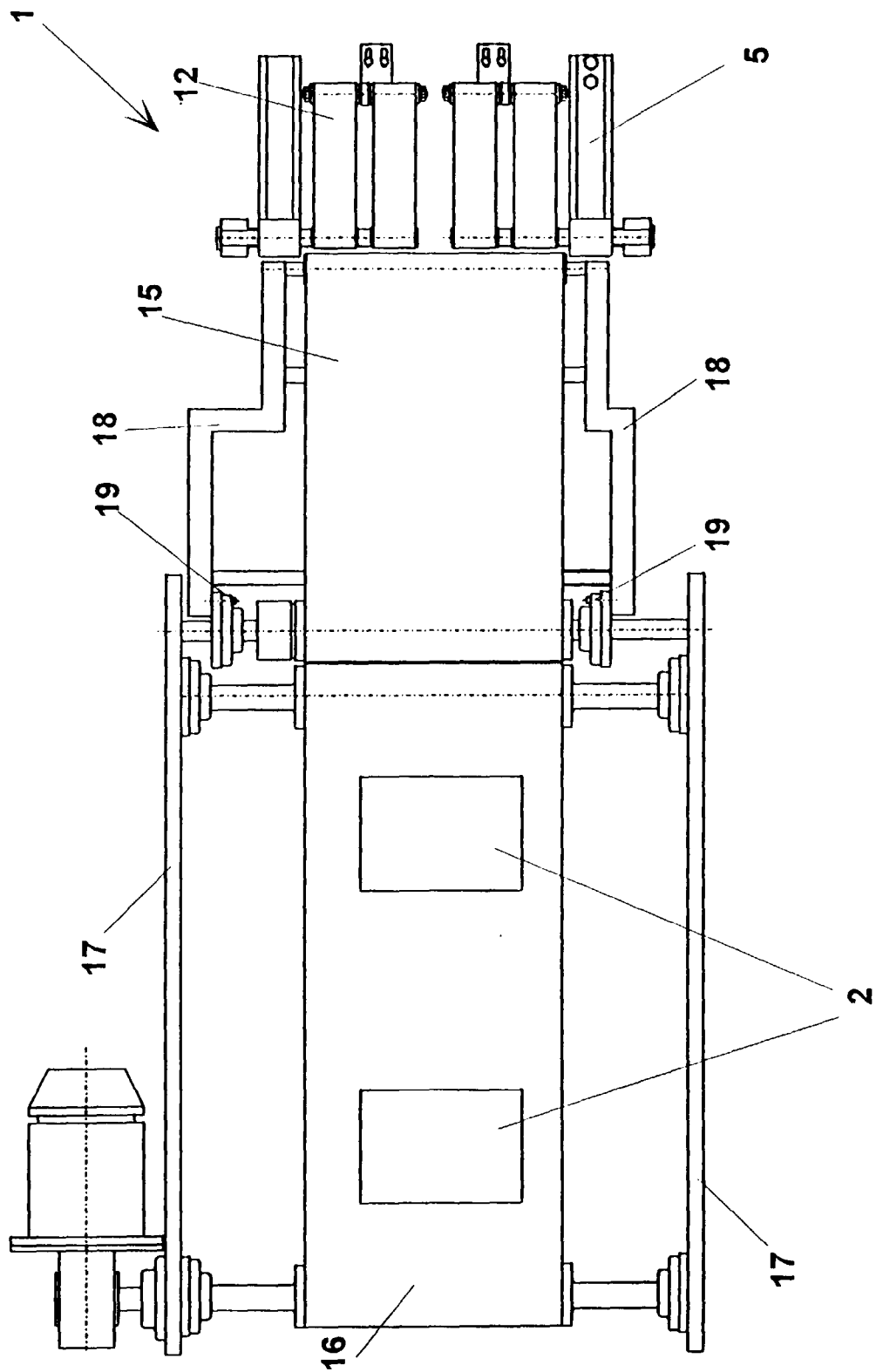
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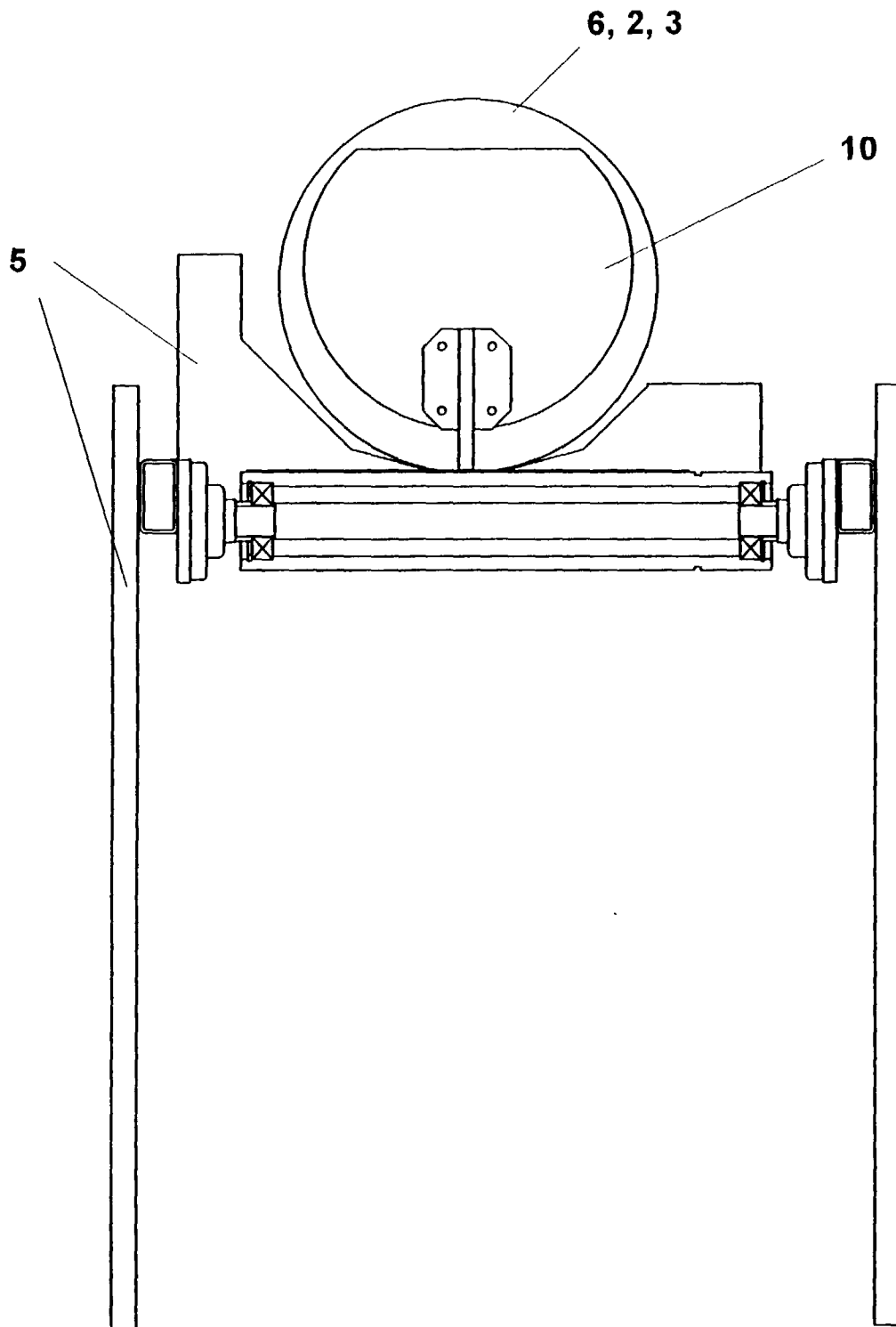
# Fig. 1



**Fig. 2**



**Fig. 3**





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Application Number  
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| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                        |                                                            |                                              |
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| The present search report has been drawn up for all claims                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                        |                                                            |                                              |
| Place of search<br><b>THE HAGUE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                        | Date of completion of the search<br><b>20 January 1999</b> | Examiner<br><b>Vaglianti, G</b>              |
| <p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone<br/>Y : particularly relevant if combined with another document of the same category<br/>A : technological background<br/>O : non-written disclosure<br/>P : intermediate document</p> <p>T : theory or principle underlying the invention<br/>E : earlier patent document, but published on, or after the filing date<br/>D : document cited in the application<br/>L : document cited for other reasons</p> <p>&amp; : member of the same patent family, corresponding document</p> |                                                                                        |                                                            |                                              |

EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
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