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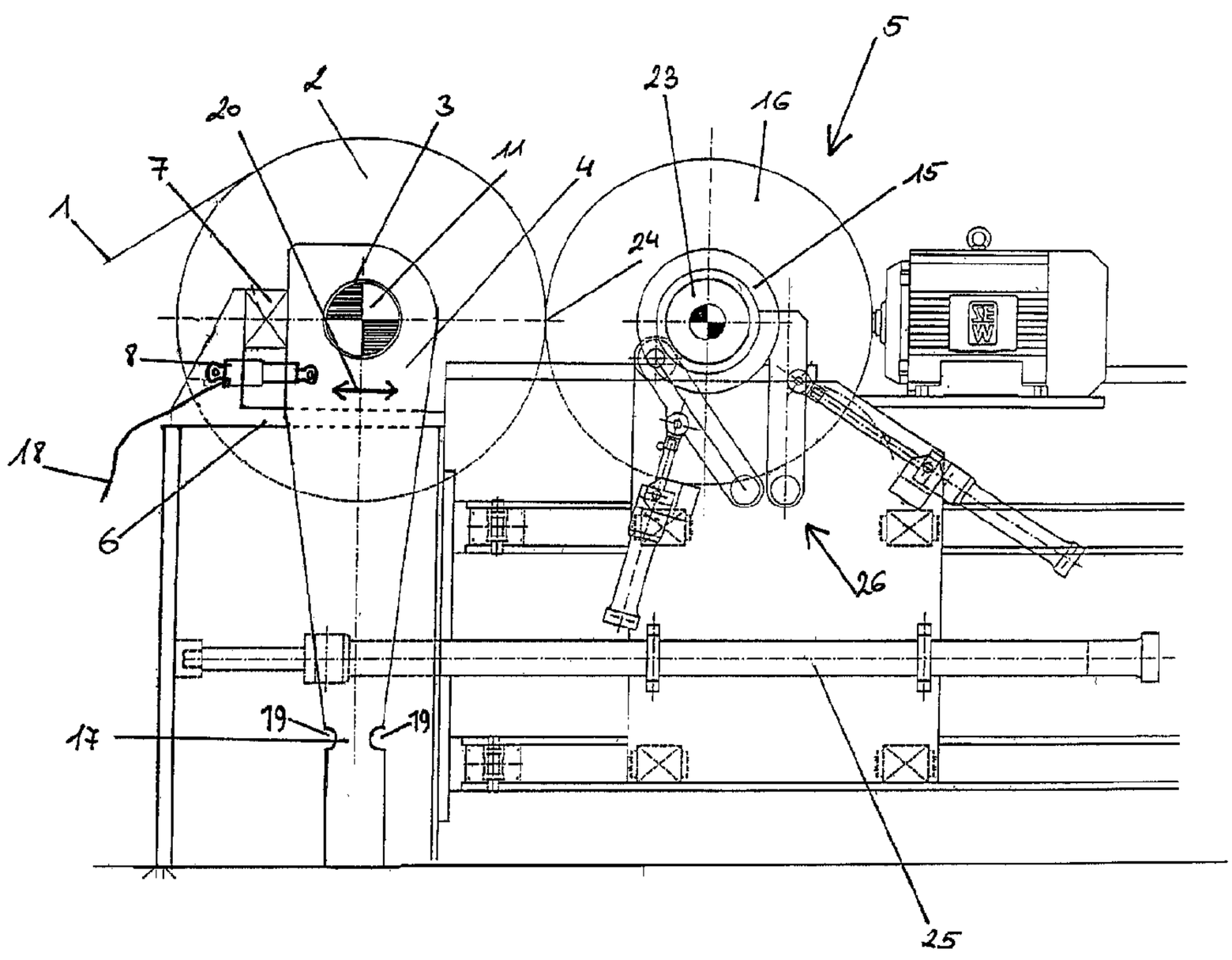


(57) Abrégé/Abstract:
The invention relates to a device for continuous reeling of a pulp web (1), particularly a paper web, for example tissue, where the pulp web (1) is carried over a reel drum (2) that is supported on rocker arms (4) and is then wound onto a winding unit (5), and the pressing force in the nip (24) is measured between paper roll (16) and reel drum (4) with the aid of a load-sensing device (7), where the rocker arm (4) can be tensioned against the load-sensing device (7) by means of a tensioning element (8). It is mainly characterised by the tensioning force for tensioning the rocker arm (4) against the load-sensing device (7) being adjustable by meant of the tensioning element (8).

Summary

The invention relates to a device for continuous reeling of a pulp web (1), particularly a paper web, for example tissue, where the pulp web (1) is carried over a reel drum (2) that is supported on rocker arms (4) and is then wound onto a winding unit (5), and the pressing force in the nip (24) is measured between paper roll (16) and reel drum (4) with the aid of a load-sensing device (7), where the rocker arm (4) can be tensioned against the load-sensing device (7) by means of a tensioning element (8). It is mainly characterised by the tensioning force for tensioning the rocker arm (4) against the load-sensing device (7) being adjustable by means of the tensioning element (8).

(Fig. 1)

Device For Continuous Reeling Of A Pulp Web

The invention relates to a device for continuous reeling of a pulp web, particularly a paper web, for example tissue, where the pulp web is carried over a reel drum that is supported at one end on a vertical rocker arm in each case, and is then wound onto a winding unit, and the load between the rocker arm and a fixed counterpart is measured by means of a load-sensing device, where the rocker arm can be tensioned against the load-sensing device by means of a tensioning element.

The pressing force in the nip between the horizontal reel and the reel drum can be measured using this load-sensing device at the rocker arm.

A device of this kind has already been described in AT 411 590 B (Andritz AG). Here, too, there is a load-sensing device to determine the pressing force in the nip, located directly between the respective rocker arm and a fixed counterpart in the paper machine frame. Before operations begin, each load-sensing device is pre-tensioned against the respective rocker arm by means of tensioning elements. This pre-tensioning is necessary because the oscillation and vibrations by the reel drum distort the measuring result. For the purposes of pre-tensioning, tensioning elements press against the load-sensing devices, thus sustained contact can be guaranteed between the rocker arm and the load-sensing device, and a continuous signal is provided for control purposes. The tensioning elements in AT 411 590 B are operated either mechanically (e.g. via springs or spring stacks) or they are operated hydraulically or pneumatically and always pre-tension the rocker arms with a constant load against the respective load-sensing device. After the swivelling levers have been tensioned, the load-sensing devices are calibrated to nip force 0. Then a pre-selected nip force is transferred via the paper roll to the reel drum by the hydraulic cylinders (or pneumatic cylinders) of the primary and secondary arms during operations. This force is measured by the load-sensing devices and the measurement result is used to control the hydraulic cylinders of the primary and secondary arms.

Pre-tensioning of the load-sensing device to a constant value before beginning operations has the disadvantage that this pre-tensioning weakens in the course of time and as a result of vibrations. Thus, it is not possible to obtain an exact measurement of the nip force. Pre-tensioning of the load-sensing device must thus be checked from time to time and re-adjusted, however this can only be done during a plant shutdown. In addition, the tensioning elements are not easily accessible, thus re-adjustment of the pre-tension is very complicated. In addition, pre-tensioning of mechanical tensioning elements is relatively inaccurate.

A further problem is the changes in the length of the fastening elements for the load-sensing device and tensioning elements caused by heat during operation. The pre-tension also changes during operation as a result, leading to fluctuating measurements.

An aim of the invention is now to disclose a device that eliminates the disadvantages mentioned, thus providing good controllability during the reeling process, even at very low pressing forces.

The invention provides that the tensioning force for tensioning the rocker arm against the load-sensing device by means of the tensioning element is adjustable during reeling operations. Thus, there is no longer any need to pre-tension the load-sensing device during assembly work. It is much easier and faster to install a load-sensing device that does not require pre-tensioning. The tensioning force on the load-sensing device can be adjusted or corrected at any time. Furthermore, it is possible to select the optimum tensioning force for the respective type of pulp. It may be necessary to use different nip forces for different types of pulp, and it makes sense to be able to readjust the tensioning force accordingly. It would also be feasible to conduct operations without any tensioning force.

Of course, it would also be conceivable to modify the tensioning force continually during the winding process of a horizontal reel.

In an advantageous embodiment of the invention the tensioning element is an adjustable hydraulic cylinder. Then it is particularly easy to set the tensioning force by means of the pressure in the hydraulic cylinder, also during operation. For this purpose the hydraulic cylinder is connected to a hydraulic line with a suitable control device.

Similarly, the tensioning element can be provided in the form of an adjustable pneumatic cylinder.

In a further embodiment, the load-sensing device is mounted in a recess in the rocker arm and connected to a fixed counterpart via a fastening element. As the load-sensing device is mounted in the rocker arm, it is protected against damage from ambient conditions, such as dust, for example, or sudden fluctuations in temperature.

The load-sensing device can, however, also be mounted between the rocker arm and the fixed counterpart. The rocker arm can thus have a simpler design, and mounting or changing of the load-sensing device is easier.

It is favourable if the bearing assembly of the reel drum is located inside a bearing assembly for a primary arm and is uncoupled from the primary arm bearing assembly. As a result, the bearing assembly for the reel drum and the bearing assembly of the primary arm lie largely in a single axis on a single level, thus the forces generated by the nip force can be absorbed more effectively by the machine frame.

According to an aspect of the present invention there is provided a device

for continuous reeling of a pulp web, where the pulp web is carried over a reel drum that is supported at both ends on a vertical rocker arm and is then wound onto a winding unit, and where the load between the rocker arm and a fixed counterpart is measured by means of a load-sensing device, where the rocker arm is tensioned against the load-sensing device by means of a tensioning element, wherein the tensioning force for tensioning the rocker arm against the load-sensing device is adjustable by means of the tensioning element and wherein the rocker arm has two recesses at sides of a lower end of the rocker arm, which result in an attenuation of the rocker arm, which permits a swinging motion of the rocker arm.

The invention will now be described using the examples in the drawings.

Fig. 1 shows an embodiment of the device according to the invention for continuous reeling of a pulp web.

Fig. 2 shows a further embodiment of the device according to the invention.

Fig. 3 shows a load-sensing device mounted in a recess in a rocker arm.

Fig. 4 shows a reel drum assembly inside a primary arm bearing assembly.

Identical reference numerals in the individual figures refer to the same components.

Figure 1 shows a device according to the invention for reeling of a pulp web 1. The reel drum 2 is supported by the bearing 11 at one end 3 in each case on one vertical rocker arm 4 in each case. In the present example, the rocker arm 4 has two recesses 19 at the sides at its lower end, which results in an attenuation 17 of the rocker arm 4. This attenuation 17 permits the swinging motion of the rocker arm 4. The swing direction of the rocker arm 4 is indicated by the arrow 20.

The pulp web 1 is wound into a paper roll 16 on a winding core 15 in a winding unit 5 after leaving the reel drum 2. The winding core 15 is placed on a winding shaft 23 guided at both ends by secondary arms 26.

A nip 2 is formed between the reel drum 2 and the paper roll 16. The pressing force of the paper roll 16 and of the rewind shaft 23 against the reel drum 4 must be measured and controlled precisely during reeling operations. The pressing force in the nip 24 and the position of the secondary arms 26 are controlled via a hydraulic cylinder 25. The pressing force in the nip 24 is measured by two load-sensing devices 7, each arranged between the two rocker arms 4, and a fixed counterpart 6. The fixed counterpart 6 is part of the paper machine frame or is firmly attached to the paper machine frame.

The measured value signals recorded control the pressing force of the two hydraulic cylinders 25 in order to ensure that the secondary arms 26 are running absolutely parallel on the operator OS and drive DS sides, and to guarantee a pre-selected nip force progression (constant or changing) throughout the entire winding process.

During winding it is beneficial if the rocker arm 4 is also pressed or tensioned against the load-sensing device 7 in addition to the pressing force in the nip 24. This tension prevents or reduces any distortion of the measuring signal from the load-sensing device 7 as a result of vibrations.

Tensioning elements 8 are provided in each case to tension the rocker arm 4 against the load-sensing device 7, where the tensioning force of these tensioning elements 8 is adjustable according to the invention. This may be an adjustable hydraulic cylinder, for example, or an adjustable pneumatic cylinder. The tensioning elements 8 are connected to an appropriate control device (not shown) by the hydraulic or pneumatic line 18.

In Fig. 1, the tensioning elements 8 are arranged directly beneath the load-sensing device 7, i.e. on the side of the reel drum 2 where the pulp web 1 runs onto the reel drum 2. The tensioning force is created by contraction of the tensioning elements 8.

The tensioning elements 8 can also be arranged on the side of the reel drum 2 on which the pulp web 1 runs off the reel drum 2, i.e. on the nip side. This arrangement is shown in Fig. 2. The tensioning force is then created by expansion of the tensioning elements 8.

Figure 3 shows a detail of the rocker arm 4 and presents a further embodiment of the invention. Here the load-sensing devices 7 are each

housed in a recess 9 of the rocker arm 4 and secured to the rocker arm 4. The rocker arm 4 has a bore 21 through which a connecting element 10 can be laid from the outside into the recess 9. The connecting element 10 is connected to the load-sensing device 7 at one end and to a fixed counterpart 6 on the paper machine frame at the other end. The diameter of the bore hole 21 should be large enough to allow the connecting element 10 to be threaded through without any difficulty and without touching the rocker arm in the process. A force between the rocker arm 4 and a fixed counterpart 6 or connecting element 10 can also be measured by means of the load-sensing device 7. The pre-tensioning of the load-sensing device 7 is also set here by means of an adjustable tensioning element 8.

Fig. 4 shows a reel drum bearing assembly 11 on the inside of a primary arm bearing assembly 12, 13 in machine running direction. The core shaft 23 with the winding core 15 placed on it is still in the primary arm 14 here and not in the secondary arm 26, as shown in Figs. 1 and 2.
The ends 3 of the reel drum 2 are each supported on the rocker arm 4; this bearing 11 is arranged inside a bearing assembly 12, 13 for the primary arm 14 and uncoupled from the primary arm bearing assembly 12, 13. As a result, the bearing assembly 11 for the reel drum 2 and the bearing assembly 12, 13 of the primary arm 14 lie largely in a single axis on a single level, thus the forces generated by the nip force can be absorbed more effectively by the machine frame. The primary arm bearing assembly 12 has an opening 22 here through which the end 3 of the reel drum 2 or the reel drum shaft passes. Here the opening 22 must be large enough to ensure that the reel drum shaft does not touch the primary arm bearing assembly 12 in spite of the slight oscillating movement of the reel drum 2. In this embodiment, the rocker arm 4 is inside the primary arm frame, as are the load-sensing device 7 and the tensioning element 8.

Reeling devices with primary and secondary arms are generally known, as is the reeling process that takes place there, which is why only a reference is made here to AT 411590 already mentioned.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. Device for continuous reeling of a pulp web, where the pulp web is carried over a reel drum that is supported at both ends on a vertical rocker arm and is then wound onto a winding unit, and where the load between the rocker arm and a fixed counterpart is measured by means of a load-sensing device, where the rocker arm is tensioned against the load-sensing device by means of a tensioning element, wherein the tensioning force for tensioning the rocker arm against the load-sensing device is adjustable by means of the tensioning element and wherein the rocker arm has two recesses at sides of a lower end of the rocker arm, which result in an attenuation of the rocker arm, which permits a swinging motion of the rocker arm.

2. Device according to claim 1, wherein the tensioning element is an adjustable hydraulic cylinder.

3. Device according to claim 1, wherein the tensioning element is an adjustable pneumatic cylinder.

4. Device according to any one of claims 1 to 3, wherein the load-sensing device is mounted in a recess in the rocker arm and connected to the fixed counterpart via a fastening element.

5. Device according to any one of claims 1 to 3, wherein the load-sensing device is mounted between the rocker arm and the fixed counterpart.

6. Device according to any one of claims 1 to 5, wherein a bearing assembly of the reel drum is located inside a bearing assembly for a primary arm and is uncoupled from the primary arm bearing assembly.

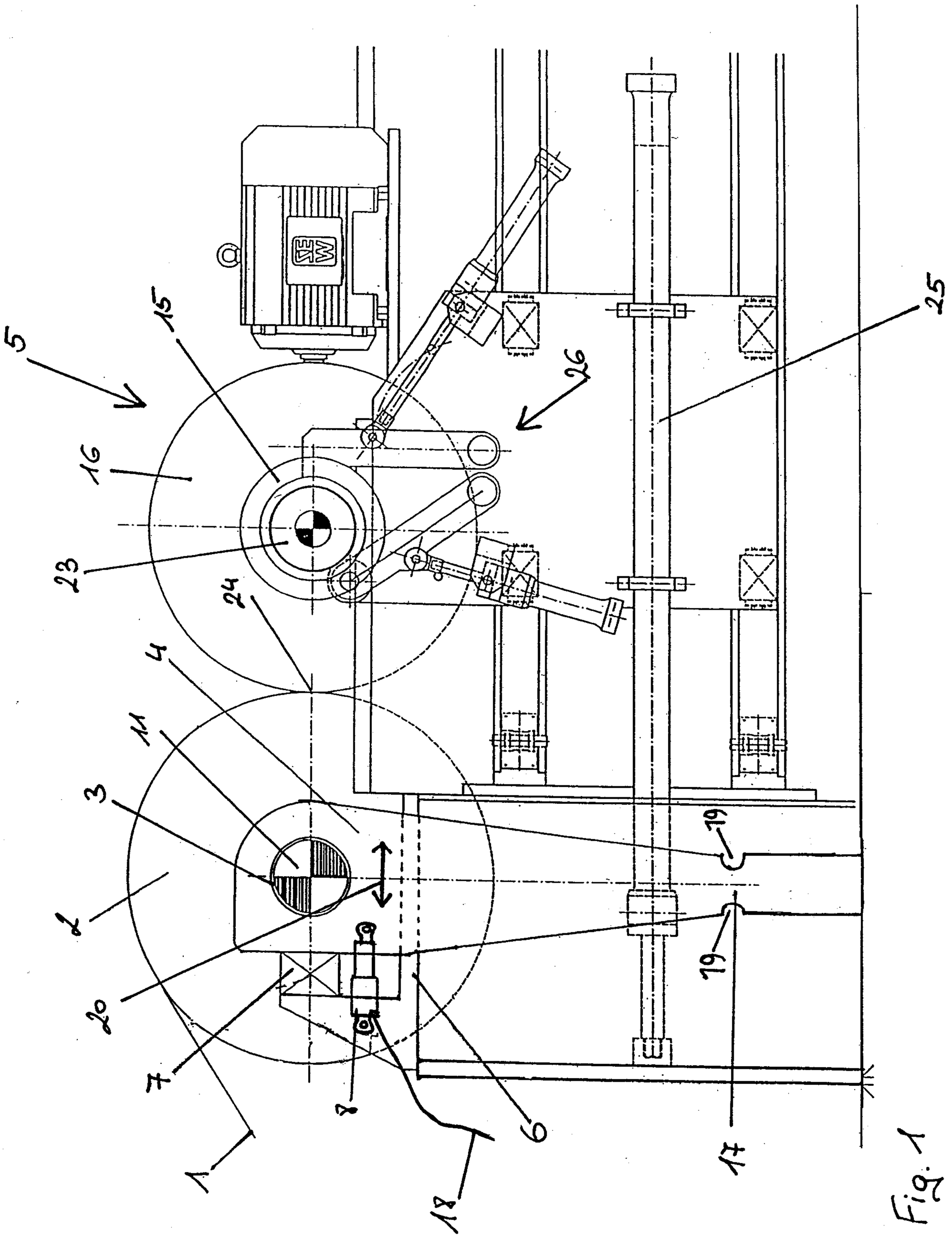


Fig. 1

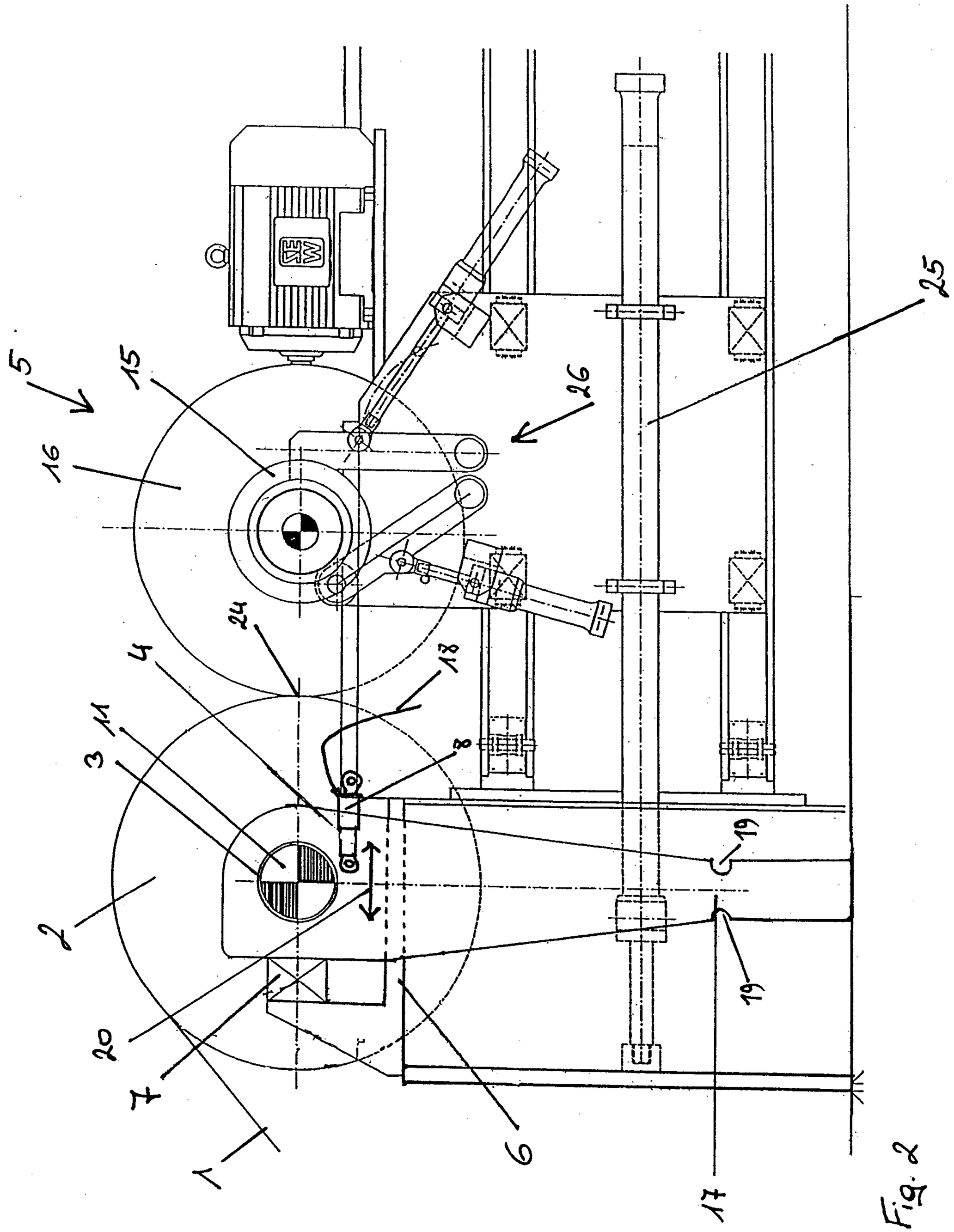


Fig. 2

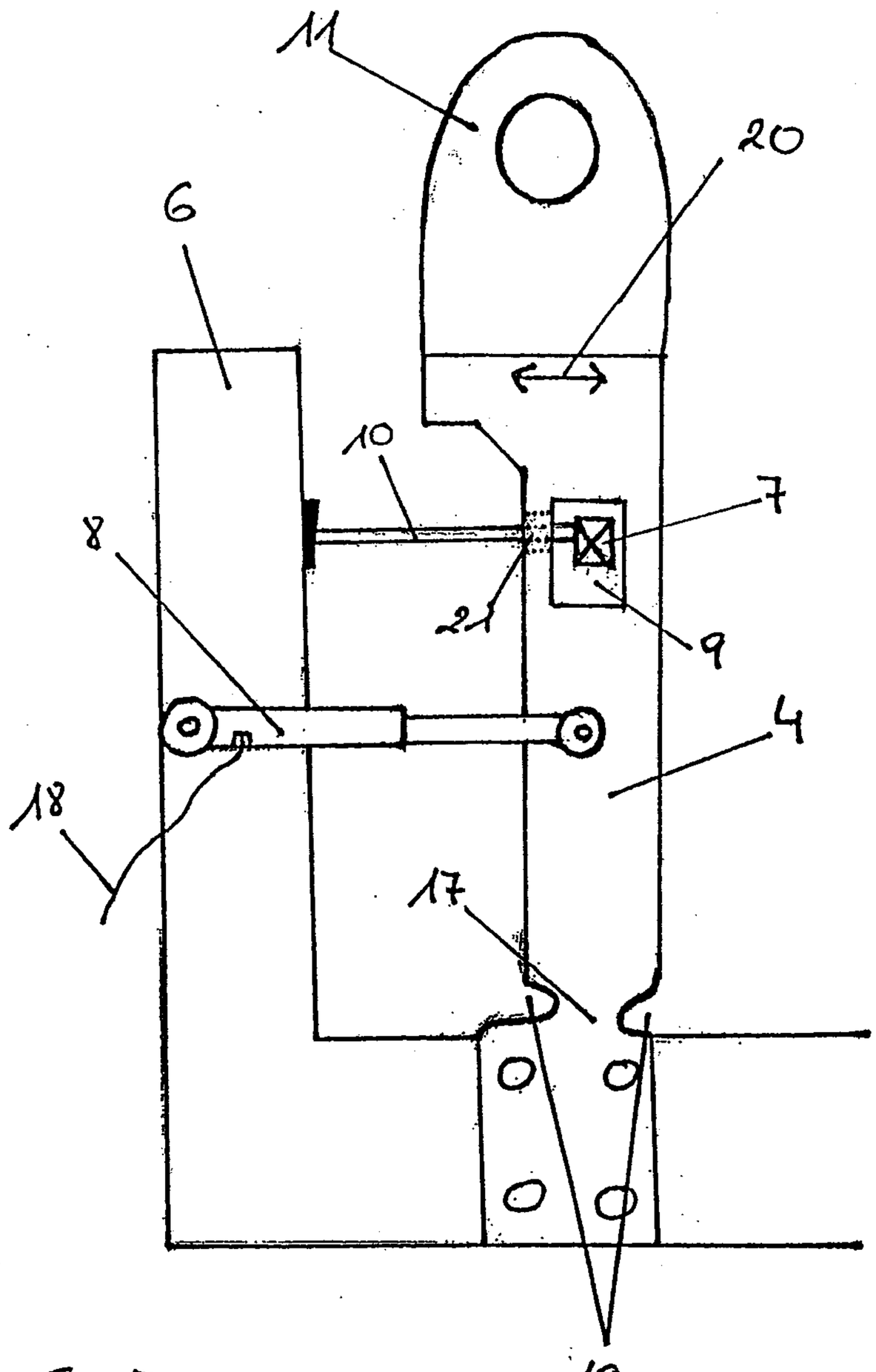


Fig. 3

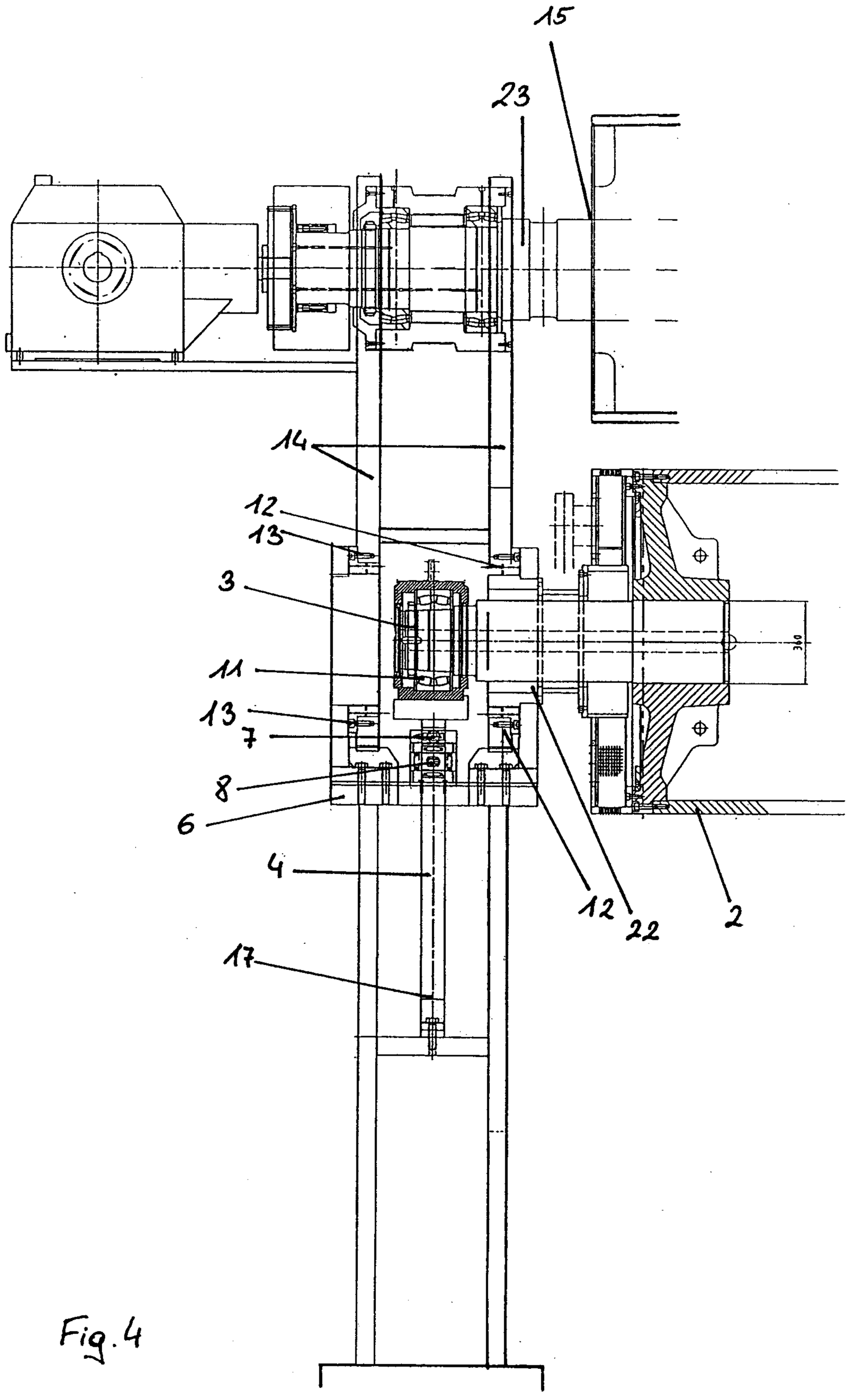
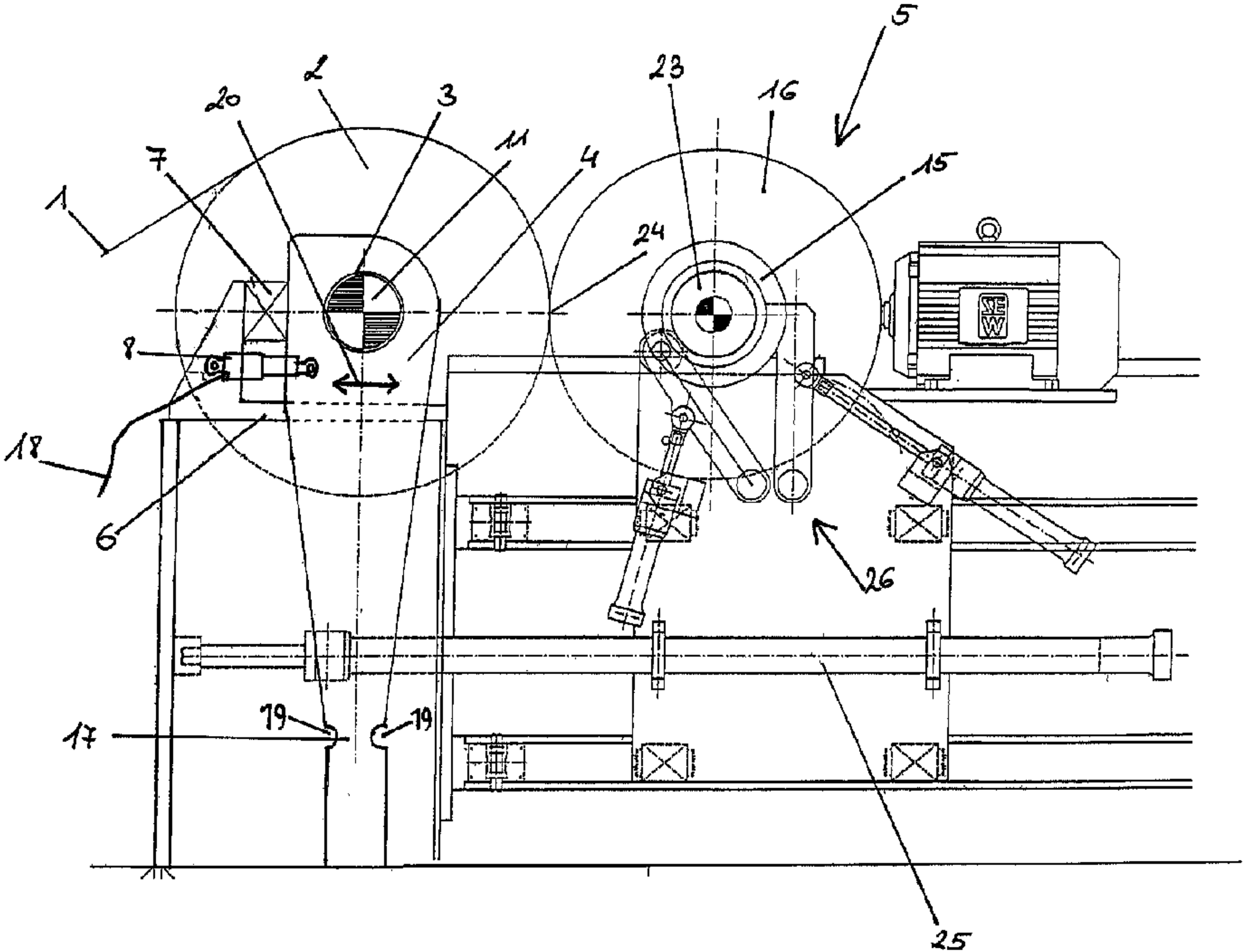


Fig. 4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