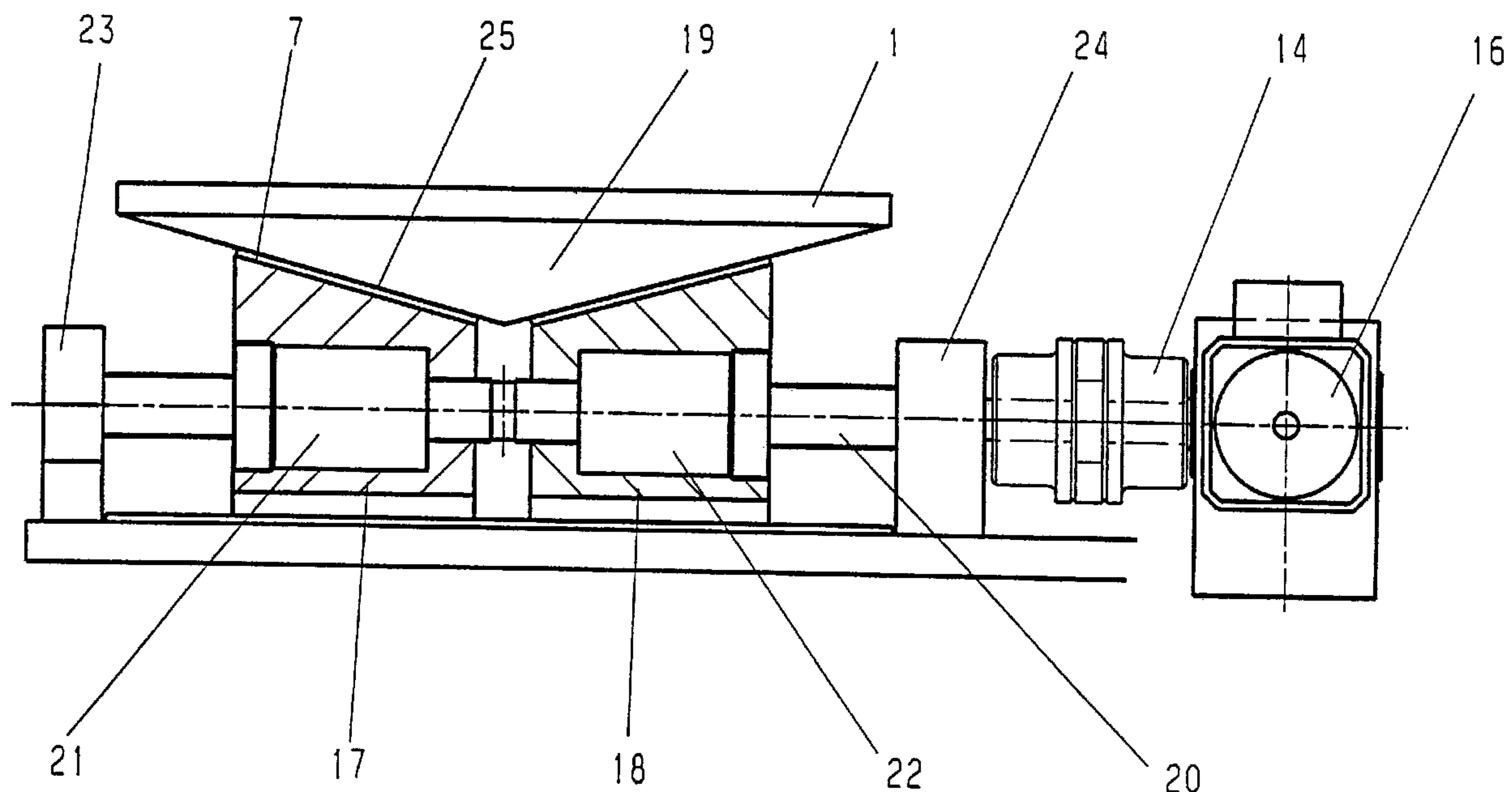




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(54) Titre : DISPOSITIF DESTINE A ACTIONNER UN COULISSEAU DANS UN DISPOSITIF DE LEVAGE OU DE
SERRAGE, EN PARTICULIER POUR L'AGRAFAGE DE TOLES DANS LA CONSTRUCTION AUTOMOBILE
(54) Title: METHOD FOR ACTUATING A TAPPET IN A LIFTING OR CLAMPING DEVICE, ESPECIALLY FOR FOLDING
SHEET METALS IN CAR MANUFACTURE



(57) **Abrégé/Abstract:**

The present invention pertains to a device for actuating a slide (1) in a lifting or clamping device, especially for folding sheet metals in automobile manufacture, wherein a slide (1) that can be driven is guided in a base (3). The inventions provides for that that the slide (1) is supported on two wedges (17, 18) with oppositely situated wedge surfaces (7) that can simultaneously be adjusted in the opposite direction by means of an electric motor via a threaded gear (20) with anti-clockwise and clock-wise thread, acting on a wedge (1) with allocated wedge surfaces (25) that is connected with the slide.



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Summary

The present invention pertains to a device for actuating a slide (1) in a lifting or clamping device, especially for folding sheet metals in automobile manufacture, wherein a slide (1) that can be driven is guided in a base (3).

The invention provides for that the slide (1) is supported on two wedges (17, 18) with oppositely situated wedge surfaces (7) that can simultaneously be adjusted in the opposite direction by means of an electric motor via a threaded gear (20) with anti-clockwise and clockwise thread, acting on a wedge (1) with allocated wedge surfaces (25) that is connected with the slide.

Fig. 1 shall be attached to this summary.

METHOD FOR ACTUATING A TAPPET IN A LIFTING OR CLAMPING DEVICE,
ESPECIALLY FOR FOLDING SHEET METALS IN CAR MANUFACTURE

Description:

The present invention pertains to a device for actuating a slide in a lifting or clamping device, especially for folding sheet metals in automobile manufacture, wherein a slide that can be driven is guided in a base.

In a prior-art device of the class described in the introduction (US 5 150 508), the folding stroke and the needed folding force are brought about by a central hydraulic cylinder located under the slide. In another embodiment, a compressed air cushion is located under the slide (DE 197 47 291). The slide moves the folding bed and the work piece (body sheet metal) located therein against the stationary prefolding and finishing folding tools, which are fastened to displaceable and pivotable means.

WO-A-97/49128 describes a press device, wherein the press slide is supported on a wedge surface, which can be adjusted by an electric motor on a gliding surface to actuate the slide.

The object of the present invention is to dispense with hydraulic or pneumatic systems for generating and transmitting the necessary force.

This object is solved in that the slide is supported on two wedges with oppositely situated wedge surfaces that can simultaneously be adjusted in the opposite direction by means of an electric motor via

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a threaded gear with anti-clockwise and clockwise thread, acting on a wedge with allocated wedge surfaces that is connected with the slide.

On rotation of the spindle, which is driven by an electric motor, the two wedges are pushed together and/or moved apart by the anti-clockwise and clockwise thread of the spindle via the threaded nuts.

Consequently, the wedges, which are connected with the slide, are accordingly moved to and fro.

In particular, the wedges featuring the wedge surface can be guided at the base.

The wedges are preferably adjustable essentially orthogonally to the working direction of the slide.

In a preferred embodiment of the present invention, threaded nuts for a threaded drive guided therein and drivable by an electric motor are arranged at the wedges. The wedges are adjusted during the rotation of the spindle and the slide is thus raised or lowered, respectively. In addition, each wedge may include a recess to accommodate the threaded nuts.

The threaded nuts preferably have a recirculating ball thread.

The spindle of the threaded drive can be connected via a coupling to an electric motor. A frequency converter preferably controls the electric motor. A transmission gear may advantageously be linked between the electric motor and the coupling. The spindle may be guided in a self-aligning roller thrust bearing on the motor side.

The device, which is preferably called an electromechanical lifting unit, can be used, among other things, in the fields of clamping technique, folding and hemming technique and also in special areas of material handling technology.

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The present invention will be explained in greater below as an example on the basis of Figures 1 and 2, where

Figure 1 shows the embodiment being the subject of this invention, using two wedges (17,18) displaceable in opposite directions in the lower position of the wedge (19), and

Figure 2 shows the embodiment according to Figure 2 in the upper position of the wedge (19).

These figures show a slide 1, which can be moved vertically up and down and carries on the topside a folding bed not shown here for the body sheet metals to be folded. Stationary folding tools, not shown, are located above the folding bed. The slide 1 is guided in a base 3. Horizontally adjustable wedges 17, 18, which are guided on gliding plates 6 arranged at the base 3, are located below the slide 1. The slide 1 is supported on oblique wedge surfaces 7 facing the slide 1.

A left-hand lower wedge 17 and a right-hand lower wedge 18 with wedge surfaces 7 sloped in opposite directions can be moved in opposite directions by means of a common threaded drive 20 with threaded nuts 21, 22 with anti-clockwise and clockwise threads. The threaded drive 20 is driven by a common electric motor 16 via the coupling 14 and has the bearings 23 and 24 on the end side. To lift the slide 1, the two wedges 17, 18 are moved simultaneously toward each other by means of the threaded drive 20, and the corresponding wedge surfaces 7 of the wedges 17, 18 glide on the wedge surfaces 25 of the upper wedge 19 and thus lift the slide 1. After reversal of the direction of rotation of the threaded drive 20, the wedges 17, 18 are again moved apart and the slide 1 is thus lowered.

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List of Reference Numbers

- 1 Slide
- 3 Base
- 6 Gliding plate
- 7 Wedge surface
- 14 Coupling
- 16 Electric motor
- 17 Left-hand wedge (bottom)
- 18 Right-hand wedge (bottom)
- 19 Wedge (top)
- 20 Threaded drive with anti-clockwise and clockwise threads (spindle)
- 21 Threaded nut with anti-clockwise thread
- 22 Threaded nut with clockwise thread
- 23 Bearing of 20
- 24 Bearing of 20
- 25 Wedge surfaces at 19

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

1. A device for actuating a slide in a lifting or clamping device, for folding sheet metals in automobile manufacture, wherein the slide can be driven and is guided in a base;
said device further comprising two wedges with oppositely arranged wedge surfaces to support said slide;
wherein said wedge surfaces can simultaneously be adjusted in opposite direction by means of an electric motor via a threaded drive with anti-clockwise and clockwise thread and which act on a wedge with allocated wedge surface, said wedge being connected to said slide.
2. A device in accordance with claim 1, wherein the wedges having said wedge surfaces are guided at said base.
3. A device in accordance with claim 1 or 2, wherein said wedges are adjustable substantially orthogonally to the working direction of said slide.
4. A device in accordance with any one of claims 1 to 3, wherein threaded nuts for the threaded drive guided therein and drivable by an electric motor are arranged at said wedges.
5. A device in accordance with claim 4, wherein the threaded nuts are accommodated in a recess of said wedges.
6. A device in accordance with claim 4 or 5, wherein said threaded nuts have a recirculating ball thread.
7. A device in accordance with claim 1, wherein the threaded drive includes a spindle connected via a coupling to an electric motor.

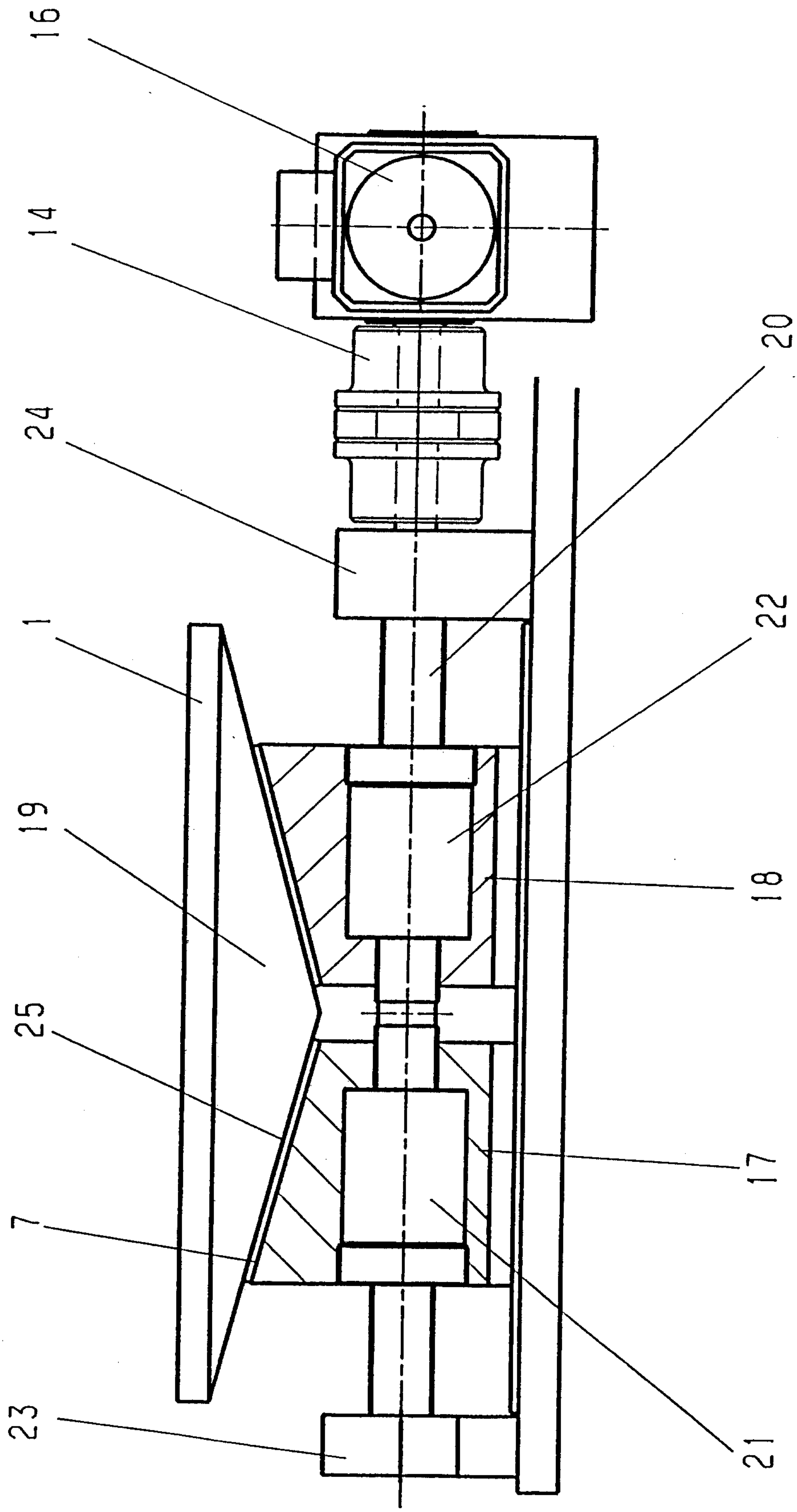


Fig. 1

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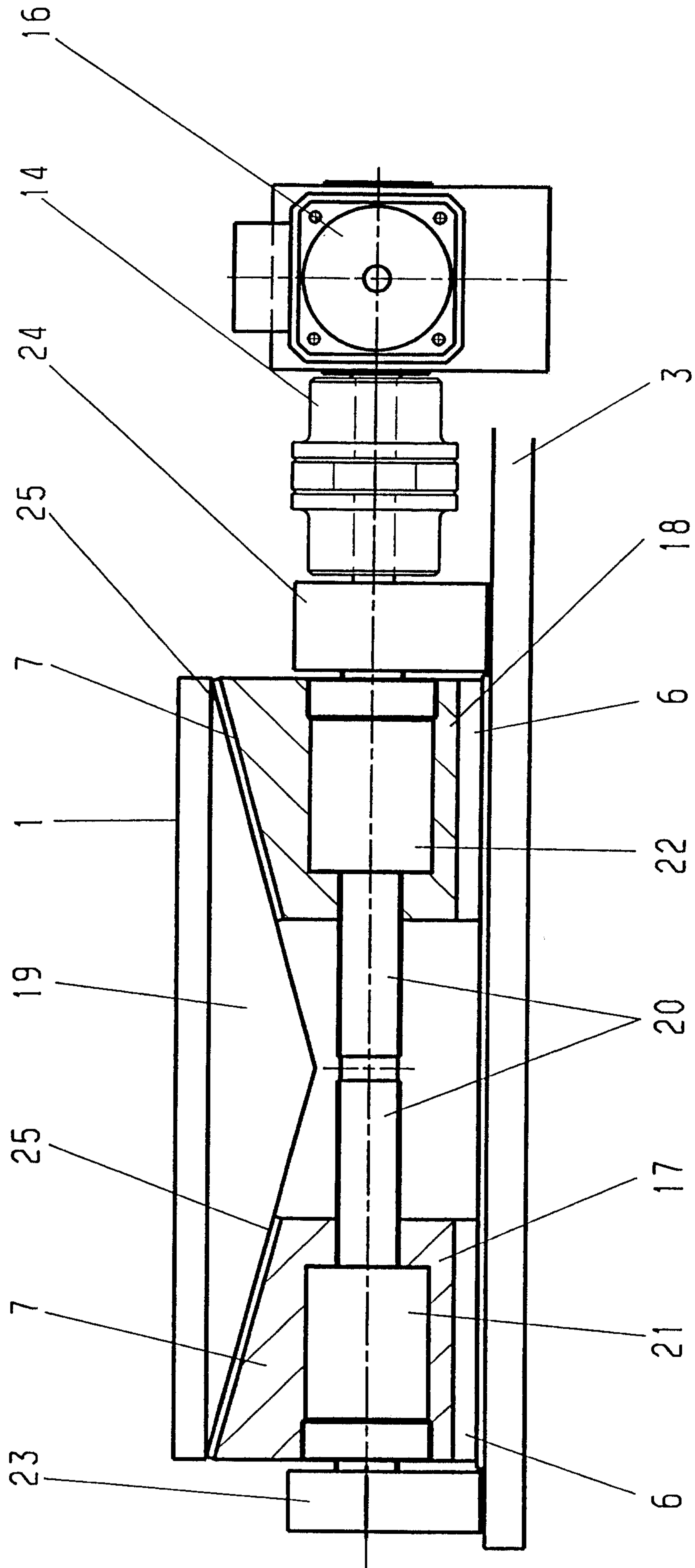


Fig. 2

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