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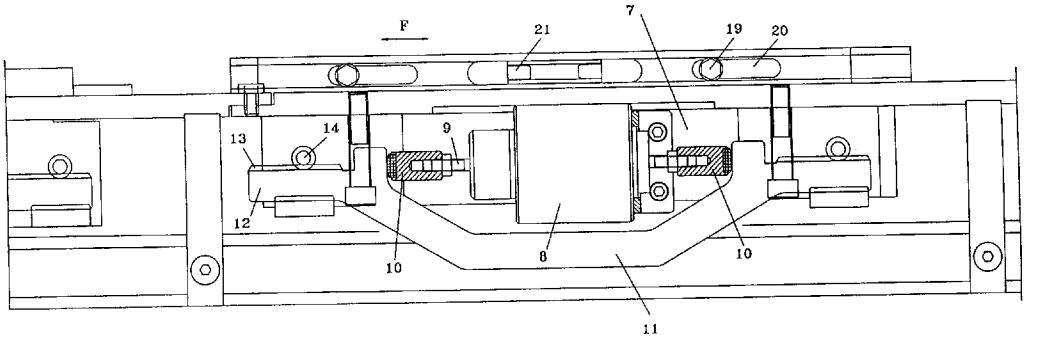
(54) **SYSTEME DE MISE EN ACTION DE TAPIS DE DECHARGEMENT DE MACHINES DE TRANSFERT**

(54) **SYSTEM FOR ACTUATING THE UNLOADING MAT IN SWITHCING MACHINES**



(57) Dispositif de mise en action de tapis de déchargement dans des machines de transfert conçues pour qu'un dispositif engage un rouleau de soutien du tapis de manière à commander sa rotation et à effectuer le déchargement de l'objet transporté au cours du mouvement vers l'avant du chariot soutenant le tapis. Le dispositif utilisé fait appel à une crémaillère pouvant engager un pignon de chaîne solidement fixé à l'arbre de l'un des rouleaux du tapis, cette crémaillère étant montée sur un support soumis à l'action de mécanismes à excentrique servant à gouverner les déplacements entre une position de repos et une position d'engagement avec ce pignon de chaîne. Une caractéristique de cette invention repose sur le fait que la crémaillère, montée sur le support, est en mesure d'effectuer de petits déplacements contre des dispositifs élastiques et dans une direction parallèle à celle du mouvement de déplacement du chariot.

(57) A device is described for actuating the unloading mat in switching machines of a type comprising means capable of engaging a supporting roller for the said mat, so as to control its rotation and effect the unloading of the transported object during the forward motion of the trolley holding said mat. Said means include a rack capable of engaging a sprocket solidly affixed to the shaft of one of the said mat rollers, and the said rack is mounted on a support subjected to the action of eccentric devices designed to govern the shifts from a position of rest to one of engaging with the said sprocket. According to a feature of the invention, said rack is mounted on said support with the capability of performing small shifts against elastic devices, along a direction parallel to the direction of the trolley's forward motion.

ABSTRACT

A device is described for actuating the unloading mat in switching machines of a type comprising means capable of engaging a supporting roller for the said mat, so as to control its rotation and effect the unloading of the transported object during the forward motion of the trolley holding said mat.

Said means include a rack capable of engaging a sprocket solidly affixed to the shaft of one of the said mat rollers, and the said rack is mounted on a support subjected to the action of eccentric devices designed to govern the shifts from a position of rest to one of engaging with the said sprocket.

According to a feature of the invention, said rack is mounted on said support with the capability of performing small shifts against elastic devices, along a direction parallel to the direction of the trolley's forward motion.

SYSTEM FOR ACTUATING THE UNLOADING MAT IN SWITCHING MACHINES

This invention relates to a system for actuating the unloading mat in switching machines of a type comprising a number of trolleys moving along a fixed path, each equipped with a rotating mat constituting the carrying plane for the object to be switched.

The invention regards the actuating devices for this mat, which is rotated when the trolley passes pre-established collecting devices to which it unloads the carried objects, based on a coding assigned at the moment of loading the machine.

According to the invention this actuating system comprises a rack mounted on a support shifted to engage the rack with a sprocket mounted on one of the rollers on which the mat is installed, so as to rotate it and unload the object.

According to a preferred aspect of the invention, this rack is mounted on said support with the possibility of performing small shifting motions opposed by elastic means, so as to favour a better engagement between the sprocket mounted on the trolley and the rack itself.

The known switching equipment comprises a number of mobile trolleys moving along a fixed path, pulled for example by chains or the like, each fitted with a rotating mat which simultaneously constitutes a carrying plane for the objects to be transported, and a device designed to unload it when passing certain pre-established collecting points.

This equipment is generally controlled by a computer and coupled to certain coding devices which assign to each of the objects, at the time of their loading on the machine, a certain trolley and exit gate and subsequently govern the actuation of the mat when it passes opposite the exit assigned to the loaded object.

Depending on the type of equipment and the user's requirements, the unloading mat may be actuated by motor devices mounted on the trolleys, each connected and coupled to an individual mat, or by mechanical means arranged along the path, so as to engage mechanical mat controlling devices installed on each trolley.

For example, one of these devices is described in the Italian patent No. 1.254.117 by the same applicant, to which reference is made for further details relating to this type of equipment.

As mentioned above, the means controlling the rotation of the mat may be of various kinds, for example devices fitted with cams that to engage certain elements attached to the mat to control its rotation, or various mechanical devices engaging the sprockets, rollers or similar elements affixed to the shaft of one of the rollers holding the mat.

The present invention relates to this field, and proposes an actuating system for this unloading mat in a switching machine, having a compact design and a precise and reliable operation.

In particular, this is a mechanical device capable of acting on the shaft of one of the rollers of the mat, and which is in turn actuated by an electromagnet.

This achieves a silently operating device of limited size, easily governed by the electronics of the machine.

This invention will now be described in detail, as a non-limiting example with reference to the attached drawings, in which:

- the Figure 1 is a partially sectioned plan view of a trolley fitted with a mat controlled by the devices according to the invention;
- the Figure 2 is a side view of the trolley in Figure 1;
- the Figure 3 is a partially sectioned view of the trolley in part 1, along a plane orthogonal with respect to the previous figure;

- the Figure 4 is a top view of the actuating devices for the unloading motion, according to the invention;
- the Figure 5 is a side view of the actuating devices shown in Figure 4;
- the Figure 6 shows, in a vertical section, a detail of the actuating devices shown in the Figures 4 and 5.

With reference to the Figure 1, no. 1 identifies the frame of one of the trolleys of a switching machine, provided with a rotating mat 2 which constitutes the carrying and unloading plane of the objects.

The mat is mounted on a pair of rollers 3, and the shaft of at least one of these rollers shafts carries a keyed-on sprocket 4.

The frame 1 is hinged to a shaft 5 (visible only in the sectional view of Figure 2) whose ends are attached to a pair of pulling chains, belts or the like which move the trolleys along their path.

Free-wheeling rollers 6, mounted on frame 1, are guided on rails or the like along their path, so as to bring the trolley and thus the plane of the mat to the desired sloping angle.

At the time of loading the object on the machine, the controlling electronics assigns the object a certain trolley and actuates, when the latter passes opposite the collecting devices corresponding to the expected point of destination, the unloading devices governing the mat's rotation to unload the object.

These devices are shown in the Figures from 4 to 6, which shall now be referred to.

The number 7 in the figures indicates the frame, holding an electromagnet 8 for actuating a rod 9 which acts, by an interposed pair of dampening elements 10, on a cursor 11 whose ends 12 carry an equal number of racks 13.

These racks engage a pair of sprockets 14, each of which is fastened to a shaft 15 provided, on the opposite side of the wheel 14, with an eccentric pin 16 (see Figure

6).

The pin commands the vertical shifts of a support 17 on which a rack 18 is mounted. When the support 17 is lowered, this rack engages the sprocket 4 on the trolley, thus rotating the roller 3 and the mat 2.

The rack 18 (see Figure 5) is mounted on the support 17 not rigidly but by means of pins 19 which can move within corresponding eyelets 20, against elastic devices 21, for instance a pair of helical springs or the like.

In this manner the rack 18 may perform limited alternating motions in the direction of the arrow F, to better engage with the sprockets 4 actuating the mat.

The embodiment shown in the figure is equipped with a pair of wheels 4 for each trolley, a configuration particularly beneficial if the path of the machine's trolleys follows a ring arranged on an essentially vertical plane, consequently including two sections of the path running in opposite directions.

In this manner, if it is for example desirable to keep the trolley always in a backward sloping position with respect to its forward motion in order to facilitate its unloading, the trolley must be tilted to one or the other side, depending on the chosen path.

The actuation will then take place by acting on one or the other sprocket, depending on the path chosen and the sloping angle of the trolley.

The apparatus works as follows.

During the transport one of the rollers 6, for instance the one in the forward section of the trolley while in a forward motion, engages a rail mounted on the machine and moves the trolley to the desired sloping angle.

Whenever the trolley carrying the loaded object passes opposite the unloading area, the machine's controlling devices actuate the electromagnet 8 that slides the support 11 with the racks 13, which in turn starts the rotation of the sprockets 14 by using the shafts 15.

The shafts, in turn, cause the rotation of the eccentric pins commanding the lowering of the support 17 and rack 18, which engages the sprocket 4 rigidly affixed to the shaft of the mat's pulling roller 3.

The rack's capability of performing limited shifts against the elastic means 21 ensures a perfect engagement between the two rows of teeth, even in the case of a slight misalignement between them.

At this point, forward motion of the trolley's and the sprocket's no. 4 with respect to the rack induces a rotation of the roller 3 carrying the mat, which unloads the object into the underlying container.

At the end of the unloading step, it suffices to again actuate the electromagnet 8 to return the rack 18 to its raised position and thus to allow the next rollers to pass without any interference.

The system described above offers the many advantages of constructive simplicity and ease of maintenance typical of mechanical systems, combined with the ease of handling of electronically controlled systems.

An expert of the trade may then apply numerous changes and variants, all of which may however be deemed to fall within the scope of this invention.

CLAIMS

1. A device for actuating the unloading mat in switching machines of a type comprising means capable of engaging a supporting roller for the said mat, so as to control its rotation and effect the unloading of the transported object during the forward motion of the trolley holding said mat, characterized by the fact that it includes a rack capable of engaging a sprocket solidly affixed to the shaft of one of the said mat rollers, whereby the said rack is mounted on a support subjected to the action of eccentric devices designed to govern the shifts from a position of rest to one of engaging with the said sprocket.

2. A device for actuating the unloading mat in switching machines according to claim 1, characterized by the fact that said rack is mounted on said support with the capability of performing small shifts against elastic devices, along a direction parallel to the direction of the trolley's forward motion.

3. A device for actuating the mat of a switching machine according to the claims 1 and 2, characterized by the fact that said rack is mounted on a support subject to the action of a pair of eccentric devices capable of simultaneously rotating said eccentrics in the same sense, so as to govern the shifting of said supports.

4. An actuating device according to claim 3, in which said eccentrics are constituted by a cursor fitted at its ends with a pair of toothed sections capable of engaging correspondingly toothed sections provided on the shafts mounting the said eccentrics.

5. A device according to claim 4, characterized by the fact that it includes an electromagnet capable of controlling the shifts of said cursor.

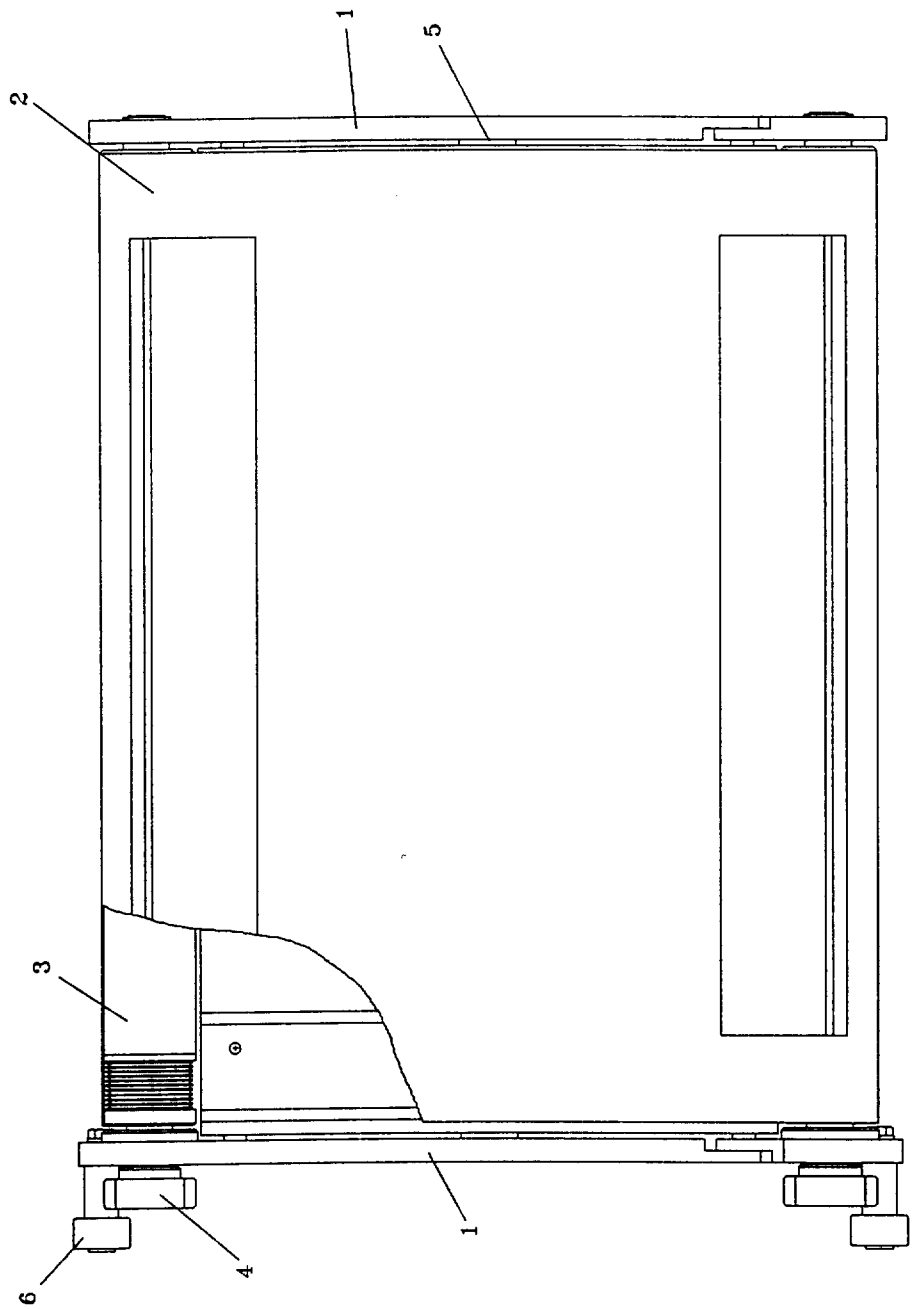
6. A system for actuating the unloading mat in switching machines in which said mat is mounted on a trolley moving along a path and equipped with a sprocket solidly affixed to the shaft of at least one of the said mat's supporting rollers, characterized

by the fact that it includes:

- a rack mounted on a support capable of moving from a position of rest to one in which the mentioned rack goes to engage the mentioned sprocket;
- a pair of eccentrics connected with said support and mounted on shafts provided, at their opposite ends, with a toothed section;
- a cursor fitted at its extremities with an equal number of toothed sections capable of engaging the toothed sections of said shafts;
- means capable of governing the shifts of said cursor to actuate said eccentrics and thereby the shifts of said support together with said rack.

7. A device according to claim 5, characterized by the fact that it provides means capable of allowing some limited motions of said rack against elastic devices, in a direction parallel to the forward motion of said trolleys.

Fig. 1



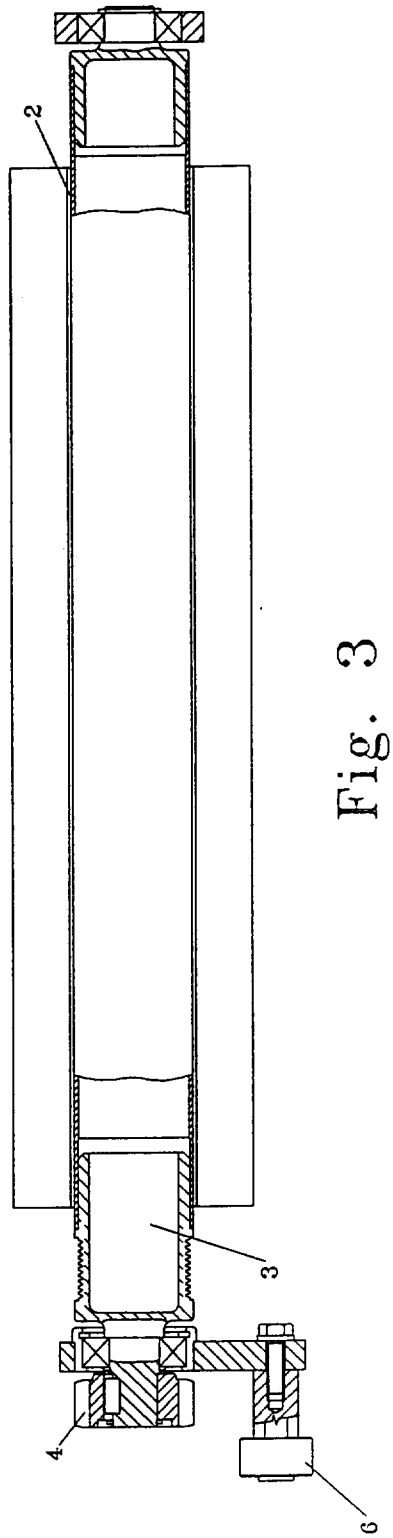


Fig. 3

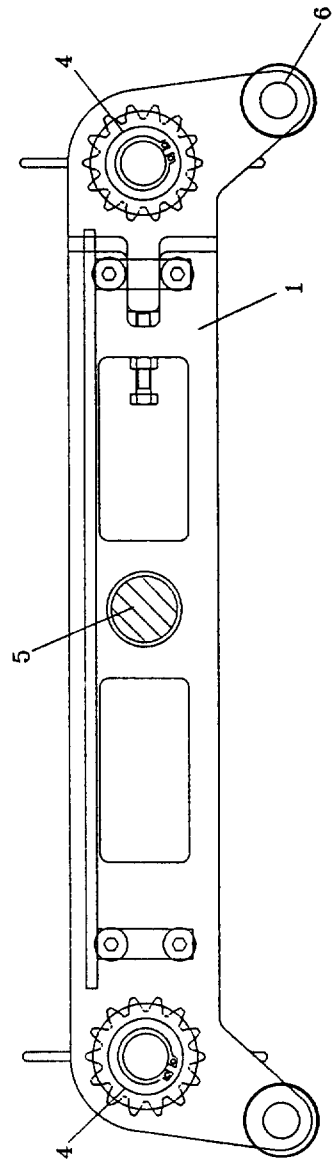


Fig. 2

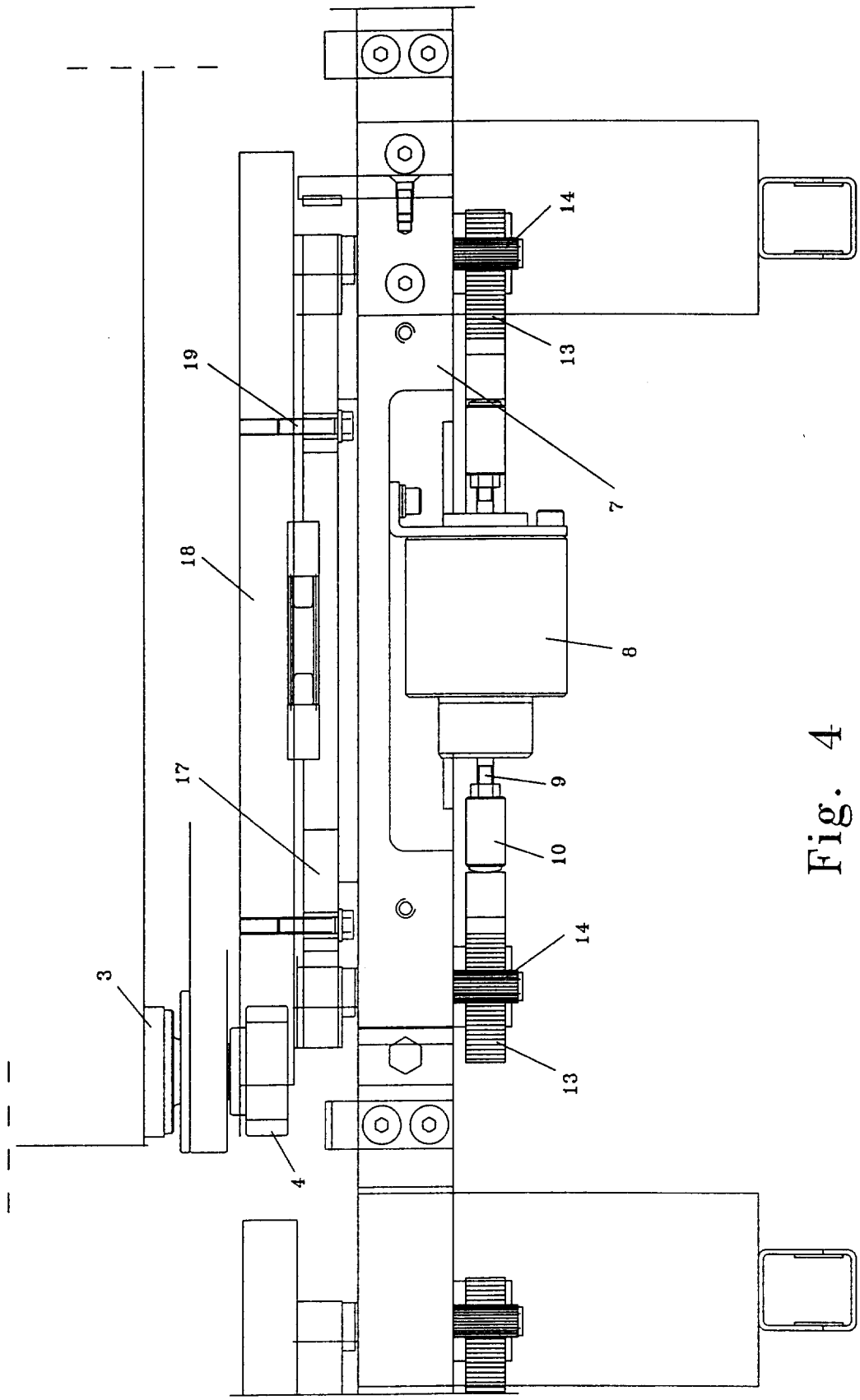


Fig. 4

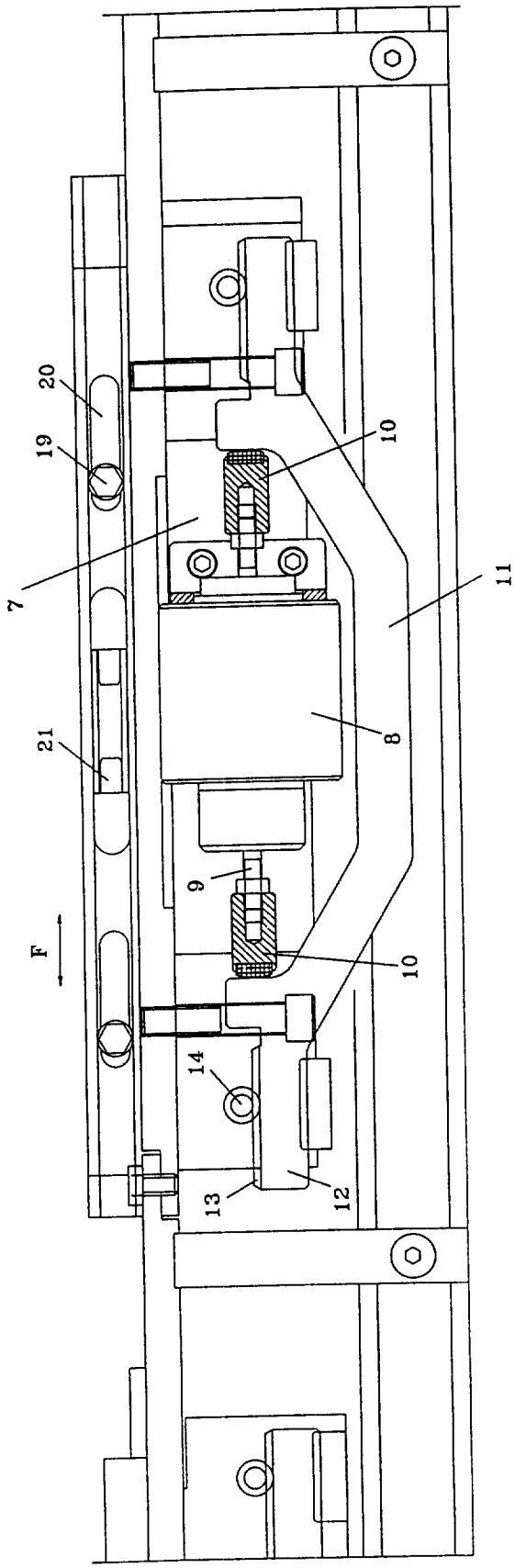
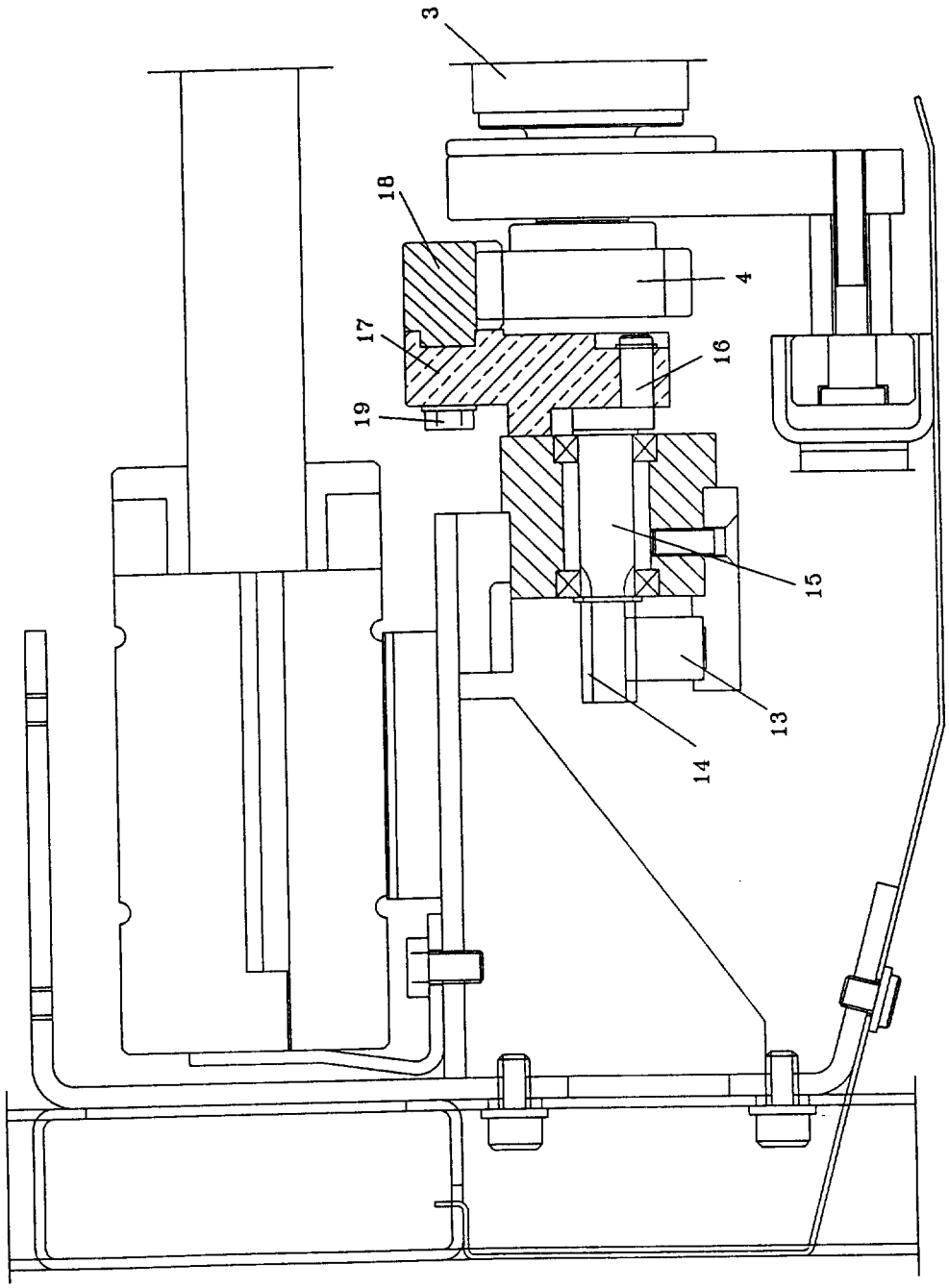
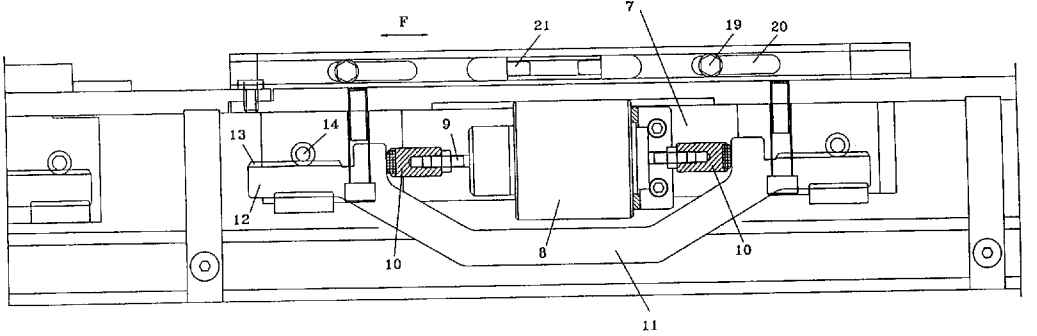


Fig. 5

Fig. 6

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