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(54) Arrangement in a lifting device for grasping lifting means on a lifted load

(57) An arrangement in a load lifting device for gripping, as to their material all kinds of lifting means, as lifting slings (16), ropes etc, in which arrangement the lifting device comprises a body (9,10) and holders, as pegs (5), fitted to the body, onto which lifting slings (16) can be lifted and fitted for the duration of hoisting and in the arrangement to lifting means (16) gripping means are fitted to lift the lifting means onto the actual holder, as for instance a hook or a peg (5). The gripping means have a pair of arms (7), the arms of which are from their upper ends by means of articulation fitted to body (9), whereby they can from their lower ends be drawn away from each other and drawn closer to each other and gripping of lifting means (16) is fitted to take place by bringing arms (7) against each other, lifting means (16) then remaining pressed between said lower ends.

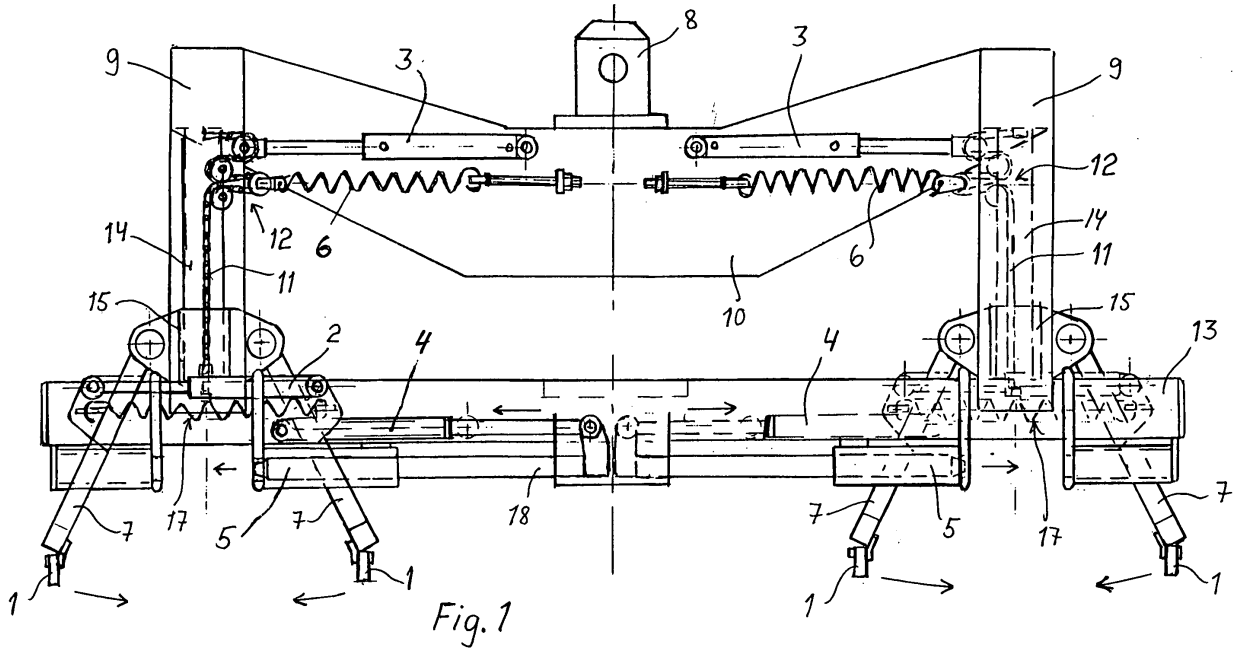

Fig. 1

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Description

[0001] The invention relates to an arrangement in a load lifting device for gripping all kinds of lifting means as lifting slings, ropes etc, that follow the load to be lifted, in which arrangement the lifting device comprises a body and holders fitted to it, as pegs, onto which the lifting slings can be lifted and fitted for the duration of lifting and in the arrangement gripping means to grip lifting means are fitted to lift the lifting means the actual holder, as on a hook or on a peg, for instance.

[0002] On hoisting loads by means of lifting slings ready wrapped around the load or threaded from the load underside at the same time the hoisting apparatus is brought to load upper side and then the slings are also installed in the hook of the hoisting apparatus. Today in both cases a person is needed to lift the slings onto the hook of the hoisting apparatus thus moving in the load hold of the ship or on the loading field. Removal of slings is usually solved in one way or another so that they come loos off the hoisting apparatus or by means of an opening motion from the hoisting apparatus, its hook or holder, when hoisting has taken place. There are for each load at least two lifting slings wrapped around the load.

[0003] This job contains many risks since the person installing slings onto hooks in the lifting apparatus moves among loads on hoisting loads and installing slings by hand in the hook of the lifting apparatus is no speedy job either, because usually the person must move per one hoist to four different positions till the slings are in hoisting apparatus. As example, hoisting of two timber loads at the same time using four slings, whereat around each load there are two slings. The slings must be hoisted at least onto two holders, however usually on four ones.

[0004] Often, from the beginning to the end, there are slings around the load, whereat hoisting would be done quickly, if the hoisting apparatus could take the slings for hoisting from the top the load

[0005] In order to solve the above presented problem a new hoisting apparatus is developed, by means of which the need of a special person is avoided, who would be there lifting slings onto the holders of the hoisting apparatus. The arrangement of the invention is characterized in that the gripping
means have a pair of arms, arms which are by means of articulation fitted from their upper end to the body, whereat they from their lower ends can be turned to draw away from and to draw closer to each other, and gripping lifting means is fitted to take place by bringing the lower arm ends against each other, while lifting means remains pressed between said lower ends.

[0006] The advantage of the arrangement of this invention is that hoisting and conveying of similar loads wrapped with slings goes quickly not needing any assisting persons. The distances of wrapped slings on the loads can vary even remarkably, since with the gripping means of the hoisting apparatus a long portion can be brushed on the load, whereat it is already possible to grip the slings. When for hoisting the slings are lifted and locked to actual holders in the hoisting apparatus the hoisting becomes fully reliable. The gripping arms of the gripping means are for instance, pieces of rubber gently treating the load surface when moved on the load. According to the invention the gripping means lightened during gripping phase while they can retreat also by quite small hoisting power, so that the load surface does no get spoiled and possibly not the wrapping on it either.

[0007] In the following the invention is disclosed with reference to the enclosed drawing, where

Fig. 1 presents the hoisting apparatus viewed from one side,
Fig. 2 presents the hoisting apparatus viewed from the end,
Fig. 3 presents securing means of gripping in opened position connected to the arms.
Fig. 4 presents securing means of gripping turning towards closing position.

[0008] Figure 1 shows the hoisting apparatus furnished with gable bodies 9 and intermediate body 10 joining them, in both gables of which there are two pairs of movable gripping arms 7. In the lower ends of gripping arms 7 there are dragging pieces 1, most suitably of rubber. When pieces 1 draw closer to each other the lifting sling 16 on the load surface remains between them. Squeezing pieces 1 against each other the lifting sling 16 can be lifted up above support peg 5 and onto it by means of gripping arms 7. Rubber pieces 1 can also be replaced by other kinds of gripping means, which have tackles, as rolls, to roll the pieces on load surface. One of the pieces or both of them can also be furnished with a wedge-shaped or similar portion in its point, whereby the piece tends to go under the cloth securing the gripping. As lifting sling a round or a flat rod can be used. As to its material it can be of any kind of tackle material, because it is not lifted by means of magnetic powers as in some solutions.

[0009] Figure 1 shows especially on its left part the moving of griping means 7, which takes place pulled by spring 17 against each other. Cylinder 2 works only to open the gripping means apart. When of griping means 7 including their sleeve part 15 are hoisted by pulling up from chain 11 it is possible by means of cylinder 4, utilizing arm construction 18 , to pull support peg 5 into locking so that sling 16 remains on the peg over the peg.

[0010] For gripping means 1, 7 the hoisting motion is arranged in vertical guide 14, where sleeve 15 is moving. Hoisting takes place by means of cylinder 3, which pulls up chain 11. In the apparatus there are also idler wheels 12, between which spring 6 is also pulling gripping means upwards. Spring 6 is so adjusted, that it has not the energy to pull up the gripping means, when they are let down, in other words sleeve 15 has got down in sleeve 14 against the stopper. On starting hoisting of gripping means 1, 7 at first spring 6 stretches a little about 5-10

cm, the spring back factor of which grows sufficiently and sleeve 15 and the gripping means begin to get up.

[0011] The solution means that that spring 6 also relieves the contact of gripping means on the load surface when the hoisting apparatus is let down above the load. The hoisting apparatus is let down to such a position that the gripping means gets upwards about 5 - 10 cm relieved by spring 6. Then spring 17 is allowed to pull rubber pieces 1 together so that the lifting sling remains between them. In this case cylinder 2 is let to get shorter. All the time spring 6 relieves the contact of rubber pieces 1 against the load. When pieces 1 are together the gripping means are by means of cylinder 3 lifted up and support peg 5 is by means of cylinder 4 moved into locking. Lifting sling 16 falls onto support peg 5.

[0012] When the load is unloaded peg 5 is by means of cylinder 4 pulled off from locking. By means of cylinder 3 gripping means 1, 7 and sleeve 15 are let down and then arms 7 are opened for gripping by means of cylinder 2.

[0013] Figure 2 shows the same procedure from the end. There are in lower body parts 9 vertical guides 13, which tie the construction rigid. There are two pairs of gripping means in both ends of the apparatus, whereby it is possible to hoist with the apparatus two loads side by side at the same time, in both of which there are two lifting slings. The hoisting apparatus is fastened in a crane by means of a fixing bit in the middle of tackle.

[0014] Figure 3 shows securing means of gripping fixed on arms 7 and formed of hook-shaped parts 19 and fitted by means of articulation fitted to turn in regard to arms 7. When approaching is made by means of arms 7 in regard to lifting means 16 said securing means 19 are by means of spring 20 turned off function, up for instance, whereby they are not in contact with the load.

[0015] Figure 4 shows arms 7 brought closer to each other in the final stage and then the upper parts of hooks 19 clash and begin to turn hooks 19 so that their lower part points move to the under side of tackle 16 to secure the gripping. The lower part points are fitted to move on lower level than the lower points 1 of the arms 7.

Claims

1. An arrangement in a lifting device for gripping, as to their material all kinds of lifting means, as lifting slings (16), ropes etc, in which arrangement the lifting device comprises a body (9, 10) and holders, as pegs (5), fitted to the body, onto which lifting slings (16) can be lifted and fitted for the duration of lifting and in the arrangement in lifting slings (16) gripping means are fitted to lift the lifting means (16) onto the actual holder, as for instance on a hook or a peg (5), **characterized in that** the gripping means have a pair of arms (7), arms of which are from their upper end by means of articulation fitted to body (9), whereby they can from their lower ends be drawn away from closer each other and closer each other and gripping of lifting means (16) is fitted to take place in bringing arms (7) against each other, lifting means (16) then remaining pressed between said lower ends.

2. An arrangement according to claim 1 **characterized in that** for gripping means (1, 7) a flexing motion up is arranged or by means of spring (6) a relief to lifting device (11, 12) in order to reduce the burden caused on the load surface by the gripping means on letting them down onto the load surface, while they are carrying out gripping.

3. An arrangement according to claim 1 **characterized in that** by means of gripping means (1, 7) lifting sling (16) can be lifted up in the lifting device above holder (5), whereby holder (5) can be moved to into locking state with the lifting sling remaining on it.

4. An arrangement according to claim 1 **characterized in that** relief spring (6) is fitted in lifting means lifting gripping means (1, 7), for instance into connection with chain (11) to produce hoisting impact in the chain.

5. An arrangement according to claim 1 **characterized in that** in the tops of arms (7) working as gripping means comprise flexible material, as squeeze pieces of rubber (1), which are fitted as tongs for lifting sling (16).

6. An arrangement according to claim 1 **characterized in that** in order to secure the gripping there are in the corresponding lower ends of arms (7) turning hooks (19) fitted to turn against each other substantially on the under side of lifting means (16).

7. An arrangement according to claim 6 **characterized in that** turning hooks (19) are fitted to turn against each other, when lower ends (1) of arms (7) are pressing lifting means (16).

8. An arrangement according to claim 1 **characterized in that** in the points of arms (7), working as gripping means, there are clamps, which are furnished with rolls for instance, improve rolling on the load surface.

9. An arrangement according to claim 1 **characterized in that** in the points of arms (7), working as gripping, means there are clamps at least the other of which is furnished with a wedge shaped part to improve penetration under sling (16), for instance.

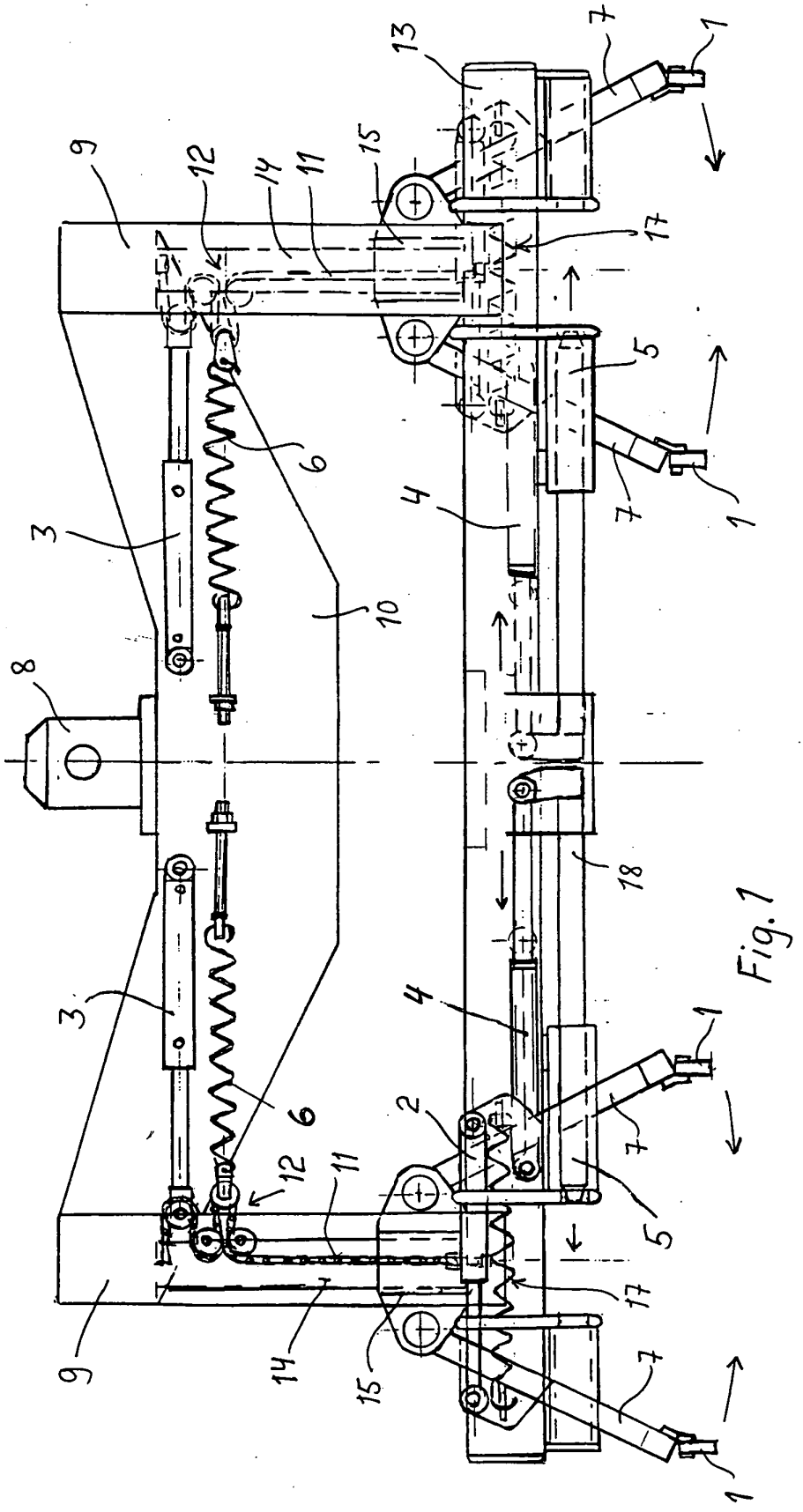

Fig. 1

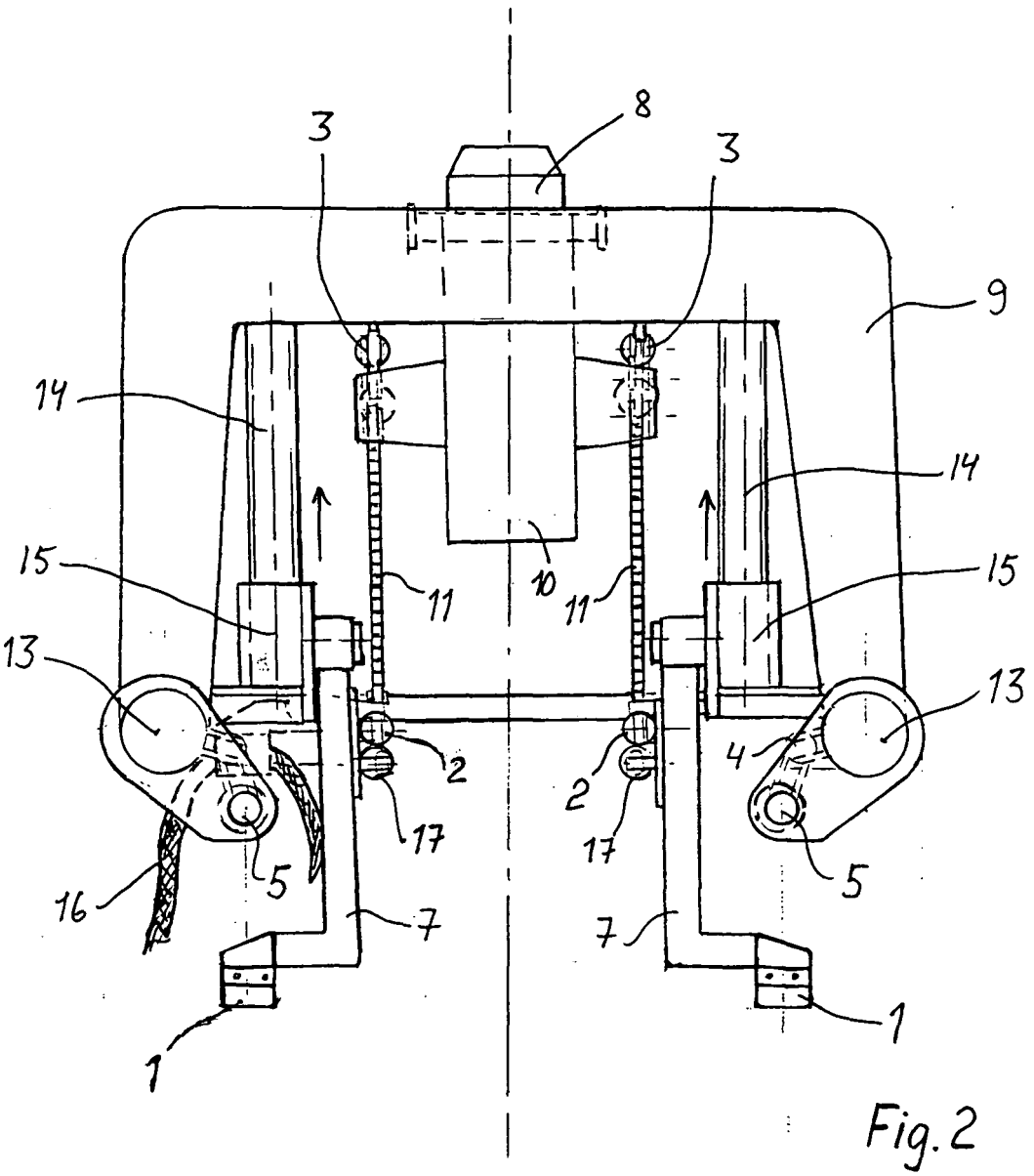

Fig. 2

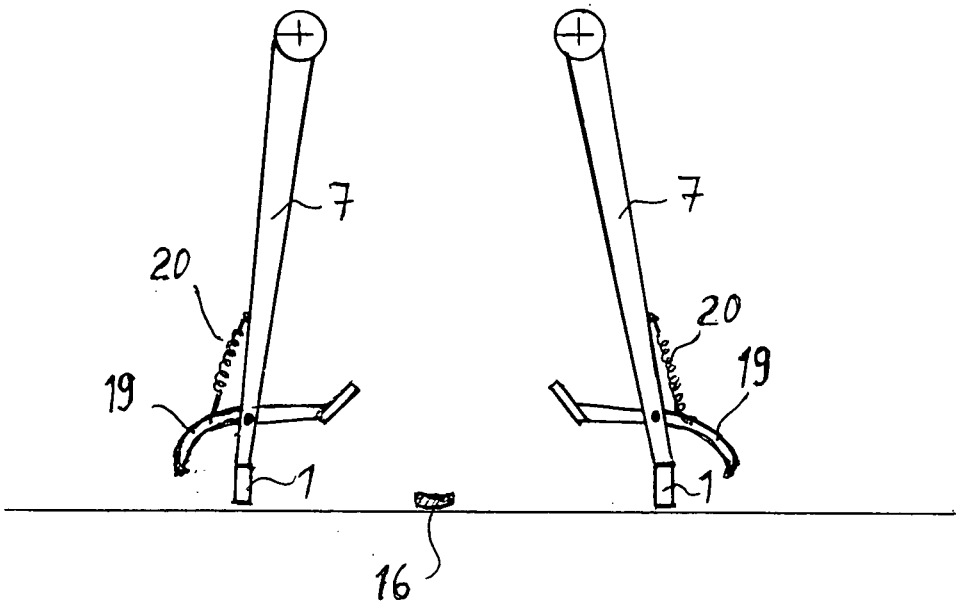

Fig. 3

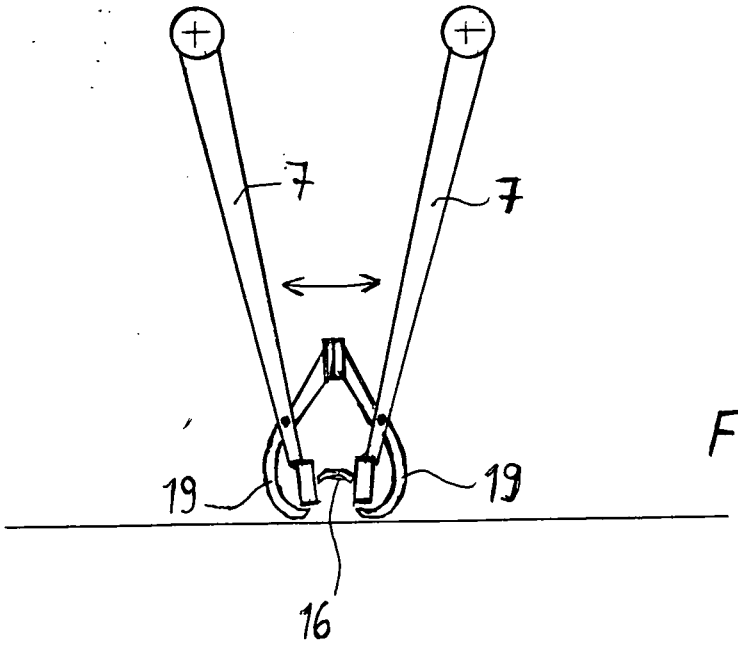

Fig. 4