

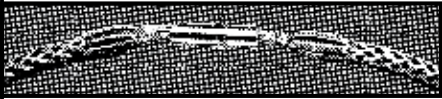
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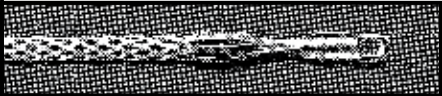
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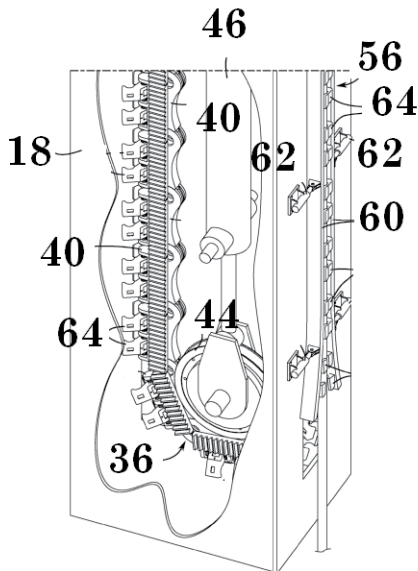
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some instances, low-speed motors 50 could be used to drive the chain 36 without gearboxes 52. Although the closed circuit traveled by the links 40 of the chain 36 in this depicted embodiment is an oval, other sheaves and arrangements may be used and the links 40 of the chain 36 may instead be driven along a non-oval path.

The closing track 56 is provided along part of the circuit that is traveled by the links 40 of the chain 36. The presently depicted closing track 56 includes opposing rails 60 spaced



**Pat. 9,790,070**

Figure 19: Detail view of a portion of the gripping assembly.

apart such that an opening between the rails 60 generally defines a travel path for the links 40 through the closing track 56. Hydraulic cylinders 62 can be coupled to the rails 60 to adjust the width of the opening between the rails.

The links 40 include clamps 64 for gripping the hoisting line 20. The clamps 64 are biased (e.g., spring-biased) toward their open position in at least some embodiments. As the chain 36 moves about the sheaves 42 and 44, and as clamps 64 of the links 40 enter an end of the closing track 56 (e.g., the lower end of the track 56 depicted in figure 19), the rails 60 engage the clamps 64 and push the opposing arms of the clamps 64 from the open position toward a closed position to grip the hoisting line 20. The rails 60 can have flared ends to facilitate entry of the clamps 64 into the closing track 56 and a gradual closing of the clamps 64 about the hoisting line 20.

The hoisting line 20 moves with the closed clamps 64 in the closing track 56. That is, as the chain 36 moves in a counter-clockwise direction in figures 18 and 19 (with clamps 64 moving up the closing track 56 between the rails 60), the clamps 64 that are closed about the hoisting line 20 pull the hoisting line 20 upward so as to raise the connected load. Similarly, when the chain 36 moves in a clockwise direction in figures 18 and 19, the clamps 64 gripping the hoisting line 20 move down through the track 56 between the rails 60 and lower the hoisted load. Due to the biasing of the clamps 64 toward their open position, the clamps 64 release the hoisting line 20 as they exit the closing track 56. Consequently, as the chain 36 moves in either direction, links 40 entering the closing track 56 grip the hoisting line 20 and links 40 exiting the closing track 56 release the hoisting line 20. The links 40 thus act as a series of hands continually gripping and releasing the hoisting line 20 to raise or lower a hoisted load. **WIKI**