

★★★ <第30回知的財産翻訳検定試験【第16回和文英訳】> ★★★
《 1 級課題 -機械工学- 》

【問 1】

A conventional squid fishing apparatus is configured as follows. The squid fishing apparatus includes winch drums B, a hinged squid landing bay C, guide rollers D, also referred to as tip rollers, and fishlines F to which sinkers E are attached to the distal ends thereof, as illustrated in Figs. 7 and 8. The winch drums B are disposed in a fixed manner on a hull A of a vessel parallel to the side of the vessel. The squid landing bay C is disposed outward of the side of the vessel at a position where the winch drums B are disposed. The guide rollers D are attached to the distal end of the squid landing bay C, and the fishlines F run over the guide rollers D from the winch drums B and down into the sea. Drive motors drive the winch drums B to winch up the fishlines F. Squid caught on fishhooks attached to the fishlines F drop onto the squid landing bay C while passing between the guide rollers D and the winch drums B. The squid that have been fished by this squid fishing apparatus naturally fall onto the squid landing bay C under their own weight while the fishhooks travel from the guide rollers D to the winch drums B. This is advantageous in that little human labor is involved for landing the squid, and accordingly, the crew are able to concentrate on operating and monitoring the apparatus and processing the landed squid, work can be carried out efficiently with a relatively small crew, and so forth.

[0003]

In such conventional squid fishing apparatuses, the winch drums are disposed in a row following the side of the hull. This means that the number of winch drums disposed is restricted by the length of the side of the hull, and accordingly the number of squid fishing apparatuses that can be installed is unavoidably restricted in accordance with the size of the hull. Moreover, the limit on the number of winch drums that can be disposed for each squid landing bay in such conventional squid fishing apparatuses is one, or two at most. Further, the winch drums of conventional squid fishing apparatuses are disposed on the deck. Accordingly, there is danger of serious accidents occurring during operation: there have been reports of incidents in which a worker was caught in a rotating drum during operation and in which

a sinker attached to a fishline being winched up flew across the deck and fatally struck a worker.

【問 2】

[0014]

Reference numeral 41 denotes a drive-force/axial-force/motor-torque calculating unit. Drive force, axial force, and motor torque are calculated from load, shaft diameter, friction coefficient, and pressure angle stored in a load/shaft-diameter/friction-coefficient/pressure-angle storage unit 21 and from gear position and gear size stored in a gear-position/gear-size storage unit 22. The principle of calculation will be described with reference to Fig. 2.

[0015]

In Fig. 2, G_n denotes a current gear of interest, G_{n-1} denotes a gear on the drive side of G_n , and G_{n+1} denotes a gear on the load side of G_n . G_n receives a drive force T_{n-1} in a direction of a pressure angle α with respect to a tangent to G_{n-1} and receives $-T_{n+1}$ as a reactive force that provides a drive force T_{n+1} in a direction of a pressure angle α with respect to a tangent to G_{n+1} .

[0016]

The resultant force of these two forces is given as axial force A_n by G_n to a shaft S_n . Due to A_n , friction is generated between G_n and S_n when G_n rotates. G_n is subjected to a frictional force R_n that is the product of A_n and a friction coefficient. Accordingly, driving G_n requires, in addition to torque for driving the load, the torque loss due to this frictional force, which is a value including the product of the radius of the shaft and the frictional force. Thus, calculating the drive force in which the load and the frictional loss for each gear is combined, sequentially from the gear under load to the motor gear, ultimately yields the necessary motor torque.

【問 3】

1. A method for manufacturing a bed of a trailer (1), comprising:
an internal bed unit forming step of forming an internal bed unit (70) by serially arranging and joining a plurality of bed constituent members (30) in a vehicle width direction by welding, the plurality of bed constituent

members (30) extending in a vehicle longitudinal direction;

a temporarily assembled bed unit forming step of forming a temporarily assembled bed unit (71) by temporarily assembling an end-part bed constituting member (37) on either outer side in a width direction of the inner bed unit (70);

a width dimension adjusting step of arranging the temporarily assembled bed unit (71) between a pair of guide walls (75) placed at a distance therebetween and fixing the end-part bed constituting members (37) to the guide walls (75) while adjusting a width dimension; and

a welding step of joining the internal bed unit (70) to the end-part bed constituting members (37) by welding,

wherein the internal bed unit (70) is provided with a width adjusting plate (50) having an adjustment allowance in a width direction of the bed on either end in the width direction of the internal bed unit (70), and the end-part bed constituting member (37) is provided with a joint plate (55) to be joined to the width adjusting plate (50) by welding, and

the temporarily assembled bed unit forming step includes temporarily assembling the internal bed unit (70) to the end-part bed constituting members (37) with the width adjusting plates (50) overlapped by the joint plates (55).