受験番号：30IPM017

問１.

As illustrated in FIGS. 7 and 8, a conventional squid fishing device includes: a winding drum B secured to a vessel body A in parallel with a side of the vessel; a flippable squid landing bay C extending from the position of the winding drum B outwardly of the side of the vessel; and a guide roller D, called a tip roller, attached to an end of the squid landing bay C. A fishing line F with a weight E on the end thereof is routed from the winding drum B on the guide roller D into the sea. When the winding drum B is operated by a drive motor to wind up the fishing line F, a squid caught on a fishhook attached to the fishing line F is allowed to drop onto the squid landing bay C while passing from the guide roller D to the winding drum B. In this type of squid fishing device, squids that have been caught fall and land on the squid landing bay C spontaneously due to their weight while the fishhooks move from the guide roller D to the winding drum B. This proves to be advantageous in that plentiful manpower is not required for landing squids, workers can concentrate their efforts to the operation and monitoring of machinery and the processing of squids, and the operation can be performed efficiently with a relatively small number of workers.

[0003]

Technical Problem

In conventional squid fishing devices as described above, winding drums are placed in line along a side of a vessel body and thus the number of winding drums is limited by the length of the side of the vessel body. This means that the number of squid fishing devices installable in a vessel is inevitably limited by the size of the vessel body. Moreover, in conventional squid fishing devices, the number of winding drums that can be installed for one squid landing bay is also limited, which is normally one, or two at best. Furthermore, each winding drum of a conventional squid fishing device is placed on the

deck of a vessel and this may pose risks of serious accidents to workers during operation. There have been reports of workers caught in a rotating drum during operation and fatalities due to weights on a fishing line flying and hitting workers while being wound.

問２.

[0014]

A driving force/axial force/motor torque calculation unit 41 calculates an axial force, driving force, and motor torque from a load, shaft diameter, friction coefficient, and pressure angle stored in the load/shaft diameter/friction coefficient storage unit 21 and a gear position and gear size stored in the gear position/size storage unit 22. A principle of the calculation is described below with reference to FIG. 2.

[0015]

In FIG. 2, Gn denotes a gear of interest, Gn-1 denotes a drive gear of Gn, and Gn+1 denotes a load gear of Gn. Gn receives a driving force Tn-1 from Gn-1 in a direction of a pressure angle α with respect to a tangent line, and receives -Tn+1, a reaction force from giving a driving force Tn+1, from Gn+1 in a direction of pressure angle α with respect to a tangent line.

[0016]

Gn then gives an axial force An, which is a resultant force of the two forces, to a shaft Sn. Gn and Sn produces friction due to An while Gn is rotated, causing Gn to receive a friction force Rn, which is the product of An and the friction coefficient. This means that rotating Gn requires a torque value obtained by adding together a torque for driving the load and a torque loss due to this friction force, i.e., the product of the radius of the shaft and the friction force. Accordingly, a driving force is calculated for each gear by adding together the load and the friction loss, in the order from a gear to which a load is applied to the motor gear. Then, in the end, the required motor torque is obtained.

問３.

1. A manufacturing method for a floor of a trailer (1), the method comprising:

an inner floor unit forming step of forming an inner floor unit (70) by arranging a plurality of floor members (30) in a vehicle width direction and joining the floor members (30) by welding, the floor members (30) each extending in a vehicle length direction;

a temporary floor unit forming step of forming a temporary floor unit (71) by temporarily attaching end floor members (37) to both outer sides in a width direction of the inner floor unit (70);

a width dimension adjusting step of placing the temporary floor unit (71) between a pair of guide walls (75) spaced apart from each other and securing each of the end floor members (37) to a corresponding one of the guide walls (75) while width dimensions are adjusted; and

a welding step of joining the inner floor unit (70) to the end floor members (37) by welding,

wherein the inner floor unit (70) includes width adjusting plates (50) at both ends in the width direction of the inner floor unit (70), the width adjusting plates (50) each including an adjusting margin in a floor width direction,

the end floor members (37) each includes a coupling plate (55) configured to be joined to a corresponding one of the width adjusting plates (50) by welding, and

in the temporary floor unit forming step, the end floor members (37) are temporarily attached to the inner floor unit (70) with the width adjusting plate (50) and the coupling plate (55) overlapping with each other.