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VIBRATION ABSORBING MEANS FOR OUTBOARD MOTOR TILLERS

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Fig. 1.

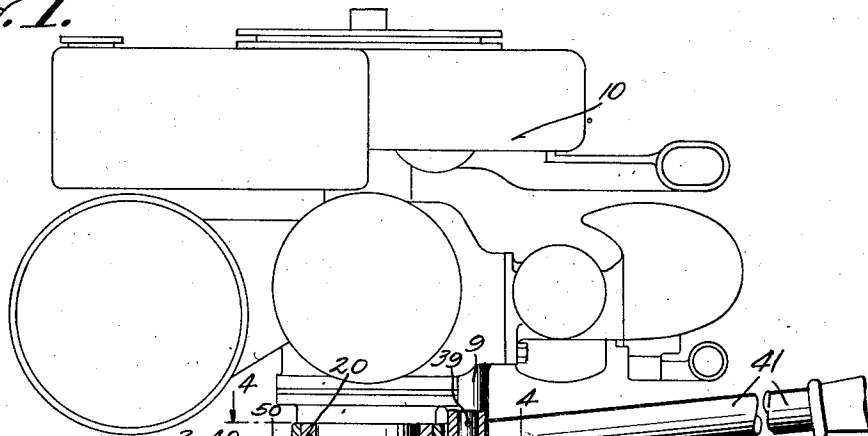


Fig. 4.

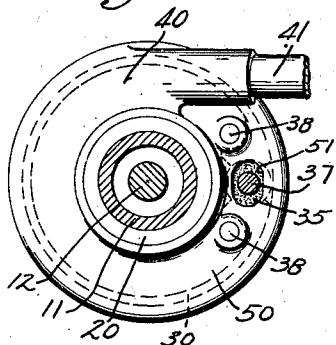


Fig. 5.

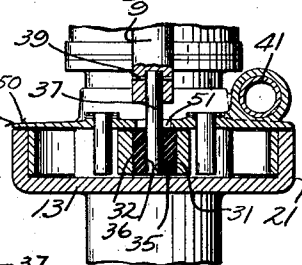


Fig. 2.

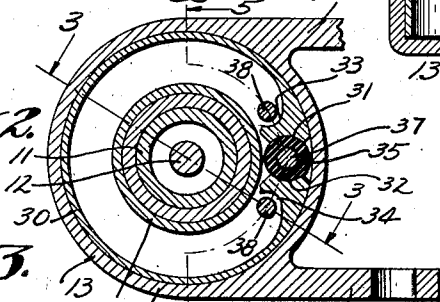
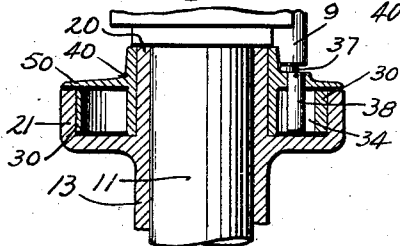


Fig. 3.



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UNITED STATES PATENT OFFICE

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VIBRATION ABSORBING MEANS FOR OUT-BOARD MOTOR TILLERS

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12 Claims. (Cl. 115—18)

This invention relates to vibration absorbing means for outboard motor tillers.

It is the principal object of this invention to provide a novel and improved means for steering an outboard motor, said means having a vibration-absorbing and tiller-locking connection between the motor and the tiller. The motor is of the well known and generally used type in which the engine and propeller and shaft housing are rigidly connected to turn as a unit for propelling and steering the boat upon which the device is mounted.

More specifically my invention comprises a cushioning and braking connection between an outboard motor casing and its support so controlled by the tiller that the motor is yieldably free for torque vibration but is locked against steering movement until the tiller is manipulated, the lock being freed by the movement of the tiller in a normal steering operation.

In the drawing:

Figure 1 is a fragmentary side view in elevation, partly in vertical section of an outboard motor embodying my device.

Figure 2 is a plan view in section taken on the line 2—2 of Figure 1.

Figure 3 is a fragmentary view similar to Figure 1 taken on the line 3—3 of Figure 2.

Figure 4 is a detail view taken in horizontal section on the line 4—4 of Figure 1.

Figure 5 is a detail view taken in section on the line 5—5 of Figure 2.

Like parts are identified throughout by the same reference characters.

The outboard motor, of which the engine 10 is shown in Figure 1, is supported by the drive shaft housing 11 in which the drive shaft 12 operates. Disposed about the drive shaft housing 11 is a swivel bracket or support 13 in which the shaft housing and engine turn for steering. The swivel bracket is carried by parallel ears 14 and pivot pin 17 from clamp arm 18. Clamp arm 18 has a clamping screw in its outer end for attachment to the transom of a boat.

The swivel bracket 13 is provided adjacent its end 20 with a braking cylinder 21 integral with and concentric to the axis of the swivel bracket 13 and the drive shaft housing 11. Within the braking cylinder 21 is an expansible brake band 30 co-acting with the cylinder as hereinafter mentioned. Brake band 30 is provided at its ends with surfaces 31 and 32 substantially concentric to dowel pin 37. It is also provided with shoulders 33 and 34 with which pins 38 are engageable.

The rubber brake band expander and cushion 35 is disposed between the surfaces 31 and 32 to normally hold the brake band 30 in frictional engagement with the braking cylinder 21. The rubber block 35 is axially apertured at 36 to receive dowel pin 37, which is secured to engine casing 9 by means of a pin 39.

Tiller handle 41 is secured to the collar 40. This collar is rotatably mounted on the swivel bracket 13 and is provided with a radially extending flange 50 intermediate its ends enclosing the braking cylinder 21. The flange 50 is provided with an aperture 51 through which the dowel pin 37 passes without contact. The pins 38 carried by the collar flange 50 are spaced to engage loosely the shoulders 33 or 34 of the expansible brake band 30 when the handle 41 is operated.

When the tiller is manipulated in a normal direction to change the position of the motor 20 for steering, one of the pins 38 engages the brake band 30 as previously suggested, and the end of the brake band 30 thus engaged will be forced toward the yieldable rubber block 35 and out of frictional engagement with the braking cylinder 21. A continued movement of the tiller will, through the rubber block 35 and the dowel pin 37, cause the engine 10 to move about its vertical axis in the same direction that the handle 41 is moved. When the steering movement 30 of the tiller ceases, the expansion of block 35 will expand the band 30 into contact with drum 21, thereby locking the motor against further movement except for the movement produced by torque vibration and accommodated by the 35 block 35.

The aperture 51 is sufficiently large to prevent dowel pin 37 contacting with the margin thereof. Any vibration of the motor casing 9 will be transmitted directly through the dowel pin 37 to the rubber block 35 and will be therein absorbed. Whatever vibration may pass through the rubber cushion will be transmitted through the brake band 30 to the bracket support 13 rather than to the handle 41.

Thus the handle 41 may be set to float upon the swivel bracket sleeve 13, being freely movable thereon in either direction to the very limited extent formed by the clearance between pins 38 and shoulders 33 and 34. This clearance relieves 50 the tiller wholly of the torque vibration of the engine and associated parts and makes it possible for the operator to maintain his grasp continuously upon the tiller handle with no strain of any kind.

When the tiller is to be used for steering purposes, it is always acting upon the dirigible portions of the apparatus through the rubber cushion, so that even during an actual steering operation the transmission of vibration from the engine through the tiller will be cushioned.

It is particularly to be observed that no special manipulation of the tiller is required for the release of the lock which normally holds the motor fixed upon a given course. The tiller is simply moved in a normal steering direction and its initial movement releases the brake band in such a manner as to free the motor for rotation in the direction in which the tiller is moving. The motor still remains locked against movement in the opposite direction and as soon as the tiller is released the expansion of the rubber cushion block engages the band to lock the dirigible parts against movement in either direction, pending further manipulation of the tiller.

Thus the rubber block 35 performs a dual function, serving first as a shock absorber yieldably permitting torque vibration of the engine and related parts with respect to the bracket and the boat, and serving secondly as an expander for the brake band which normally locks the dirigible motor parts against any steering movement while permitting the torque vibration aforesaid.

It will be recognized by those skilled in the art that while the construction herein disclosed has particular advantages and particular significance in the outboard motor art because of the problem of torque vibration present in that art, nevertheless the locking feature automatically effective to hold and control in any desired position of adjustment has utility wherever it is desired to lock any control in any kind of apparatus.

I claim:

1. In a device of the character described, the combination with a swivel bracket and a rotatable member mounted therein, of locking means including relatively movable parts one of which is connected with the swivel bracket, a yieldable connection between the other of said parts and said member and arranged to tend to cause locking of said other part with the first mentioned part, and a tiller engageable with said other part for the release of said locking means and the rotation of said member, whereby said member and said tiller are yieldably connected during manipulation of said member by said tiller.

2. In a device of the character described, the combination with a bearing sleeve and a member rotatable therein, of a brake drum connected with the bearing sleeve an expanding brake band fitted within said drum, means yieldably tending to separate the ends of said band whereby to expand said band into frictional engagement with said drum, means establishing a connection between said member and an intermediate portion of said band expanding means, whereby yieldably to permit of movement of said member respecting said band, and a lever provided with lost motion connections alternatively engageable with the respective ends of said band, whereby to compress said band against said expanding means to free said band for movement respecting said drum and yieldably to transmit motion through said expanding means to said member.

3. In a device of the character described, the combination with a bearing sleeve and a brake drum connected therewith, of a member rotatable in said sleeve, a brake band frictionally engageable with said drum, elastic means between the

ends of said band and acting thereon in a direction to maintain said frictional engagement, a lever swiveled for movement about said sleeve and provided with lost motion connections engageable alternatively with the respective ends of said band in a direction to free said band from said drum, and a connection between said elastic means and said member whereby yieldably to position said member with respect to said band and lever.

4. In a motor support the combination with an outboard motor swiveled therein, of means for locking said motor to said support including an elastic connection to said motor, said elastic connection being effective to maintain said locking means normally engaged to position the motor while permitting of the oscillation thereof pursuant to torque vibration.

5. In an outboard motor the combination with a swivel bracket thereof, of tiller controlled means for releasably locking said motor to said bracket, said means including complementary lockable parts and an elastic member connected with one of said parts and with said motor, said tiller being connected with said last mentioned part and coupled solely through said elastic means with said motor.

6. In an outboard motor the combination with a swivel bracket and a motor rotatable therein, of a locking part connected with said swivel bracket, a tiller provided with means mounting it for oscillation about said swivel bracket, a second locking part complementary to the first and operatively connected to be actuated by the tiller, and elastic means imposed between said last mentioned locking part and the motor, said tiller being connected to the motor only through said elastic means and last mentioned part whereby the position of the motor is yieldably determined by said last mentioned locking part subject to the control of the tiller but free for torque vibration with respect thereto.

7. In an outboard motor structure, a support, a motor rotatable on the support, a handle for rotating the motor, and means connecting said handle with the motor and frictionally engaging said support, said means having a resilient connection interposed between said handle and said motor.

8. In an outboard motor structure, a support, a motor rotatable on the support, a handle for rotating the motor, and brake means interposed between said handle and motor, said means comprising a friction element engaging said support, means carried by the handle for withdrawing said element from frictional engagement with the support, and resilient means interposed between said friction element and said motor.

9. In combination, a support, a member rotatable therein, a drum connected with said support, a brake band frictionally engageable with said drum and having free ends movable for the expansion and contraction of said band, elastic means between said ends pressing said band against said drum, a carrier for said elastic means connected with said member whereby the rotative position of said member is yieldably fixed by said elastic means and carrier and band with respect to said member and support, together with means for engaging an end of said band in a direction to overcome said elastic means and release said band from said drum for the adjustment of the angular position of said member.

10. In combination, a bearing, a member rotatable therein, a drum substantially concentric

with the bearing, a brake band having free ends and applied to said drum, elastic means between the ends of said band pressing said band into engagement with the drum, the ends of said band having shoulders for engagement in a direction to relieve the pressure of said band upon the drum against the pressure of said elastic means, a support for the elastic means connected with said member, whereby the position of said member is yieldably fixed through said elastic means and band with respect to said drum and bearing, and a handle having means alternatively engageable with the respective shoulders of said band in directions to free said band and member for rotation in either direction with respect to said drum and bearing.

11. An outboard motor structure comprising the combination with a supporting sleeve, of a motor having a bearing in said sleeve for support thereby, a brake drum concentric with said sleeve and connected therewith, a handle pivoted for movement about said sleeve and provided with a flange comprising a cover for said drum, a brake band having free ends expansible within said drum for frictional braking engagement therewith, an elastic block interposed between the free ends of said band and exerting a band expanding pressure, a support for said block connected with said motor whereby the position of said motor is yieldably determined by said block and band

with respect to said drum and support, shoulder terminals on said band, and pins connected with said handle and spaced to engage said shoulder terminals alternatively with a slight degree of lost motion, whereby said handle is normally free of said motor and is engageable therewith only through said band and block, the initial engagement of a given pin with a shoulder terminal of said band being adapted to release said band for rotation in the direction in which said handle tends to rotate said motor, whereby said motor is normally locked in a given steering position but is free to vibrate in said position and is unlocked for rotation to a new position by a normal steering movement of said handle.

12. In an outboard motor structure, the combination with a brake drum and a motor member rotatable therein, of a brake band connected with said member and engageable with said drum, means elastically forcing said band into engagement with the drum, whereby automatically to lock said member in any given position of adjustment, a tiller for swinging said motor for steering purposes, and means loosely connecting said tiller with said member and including mechanism opposing the action of said elastic means on said brake band, whereby to free said motor for swinging movement preliminary to the movement thereof by said tiller.

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