FASTENING APPARATUS OF COMBINED BOAT

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ABSTRACT

A fastening apparatus of a combined boat for securely joining boat hulls of the combined boat is disclosed. Grooves (3) are provided at the peripheries of joints of the boat hulls. The fastening apparatus includes a holding band (2) with ridges (4) mating with the grooves (3), and the holding band engages via the ridges (4) with the grooves (3) so as to join the boat hulls of the combined boat together securely. The fastening apparatus of the combined boat is simple in structure, easy to manufacture, and convenient to mount and dismount.
FASTENING APPARATUS OF COMBINED BOAT

TECHNOLOGY FIELD

[0001] This design relates to an apparatus of combined boat and kayak, especially a kind of combined boat that has semicircle shaped band fastening part with grooves inside to fasten the boat securely.

BACKGROUND TECHNOLOGIES

[0002] The small boats and kayaks that are commonly used nowadays mostly are made of glass fiber reinforced plastics or normal plastics. These kinds of materials have advantages of low cost and easy to make, but the strength and durability of boats and kayaks made of them are not as good as the ones traditionally made of metal and wood. Currently the combined boat design field uses screws, locating pin and splint to fix the separate parts of the boat together. This kind of apparatus has small force contacting surface, so it has a great pressure at the joints and the small surface; therefore, the material fatigue or creep is easily occurred. And this might cause the shortened lifespan of the boat and safety issues. Also, this kind of structure is complicated, and it is hard to assemble, hard to take apart, and the nuts/screws are easy to lose.

[0003] For example, U.S. Pat. No. 4,522,145 A published a transferrable boat. The two parts of the boat is combined through a “T” shaped structure that requires 3 sets of nuts/screws. This kind of structure is complicated, and the assembling and disassembling requires the help of a wrench, so it is not convenient.

[0004] Also, CN 2106793 U published a combined boat that uses several locating pins and screws to fasten the two bodies. So separately operating on the locating pins and screws are required when assemble and disassemble the boat. And tools are required to perform these tasks. Therefore, it is not convenient.

[0005] JP 5131979 A published a submerged device. It uses holding band to fix with the groove on boat. This holding band is the combination of two semicircles. When it is fastened, the two semicircles are combined to form a whole circle and it can adjust the inner circumference using the hinges on the circle. This kind of structure is complicated and not easy to operate and use. And this kind of design is for devices underwater, which has a different environment from the boat that travels on the water, like my design, fastening apparatus of combined boat.

[0006] U.S. Pat. No. 6,634,825 B2 published a connecting cylindrical apparatus, like showing in FIG. 2. It uses two semicircle holding bands to fix with the groove on the boat. It is similar to the above design from Japan. The disadvantages of this design are some tools are needed when assembling it since the screws are tightly fastened on the two semicircles. And this kind of design has a complicated structure too. It is not easy to operate and it has great pressure on the connecting part. This device is used under water, which is different from the boat and kayak that travel on the water. The environments are different.

[0007] WO 2008049158 A1 published a kind a boat that has some anchoring structure at the front and back of the boat. Through the holding band and anchors, it connects the different pieces of bodies together. This kind of structure might seem to be easy to operate, but it might not be easy to assemble, disassemble and fasten. And when there is a big wave, the safety of the boat is concerned.

Design Content

[0008] To solve the above problems, this design is intended to provide an apparatus that is a simple, secure, easy to manufacture, convenient to mount and dismount.

[0009] To achieve the above results, this design uses the following technologies: a strip holding band that looks like a semicircle, used to combine the parts of separated parts of a boat and kayak. The characteristics are: grooves are provided at the joints of the boat hulls; the fastening apparatus includes a holding band with ridges mating with the grooves, and the holding band engages via the ridges with the grooves so as to join the boat hulls of the combined boat together securely.

[0010] By using the above technologies, since the holding band has ridge on it, it mates the groove part on the boat tightly and securely. The semicircle holding band can connect all the surfaces on the boat together tightly. The whole apparatus is simple structured; since the ridge and the grooves are connected tightly, to make sure the whole boat is travelled in the water smoothly and safe.

[0011] The connecting part from the above technology is locking grips.

[0012] The holding band from the above technology has a hinge structure near the gunwale.

[0013] The holding band from the above technology is made of hard material.

Useful Effects

[0014] Boats with this semicircle strip holding band structure provided in this design have many advantages. For example, when people are boating, the connecting part has a wide and big contacting surface, so the pressure is small and evenly spread out. The connecting groove near the gunwale is strong, so it will not deform easily under great pressure. It does not require to use tools to assemble or disassemble. The user can use his/her hand to perform the tasks. It is easy to assemble and disassemble. It does not need screws or locating pins.

[0015] Since the user of the design boat is normally not a professional that has much knowledge about boats, it is hard for the user to properly adjust the level of tightness of the screws, so it could be easy to break if it is fastened too hard and could be unsafe if it is not fasten enough. But this design eliminates this kind of problem.

[0016] Nuts and locating pins are many small objects. They are easy to get lost by storing and transporting, especially when assembled or disassembled around the lake or the sea. These places usually have sand, gravel or grass, it would be hard to find the lost pieces, which will cause difficulties to use the boat. But this design eliminates this kind of problem.

[0017] The forces caused by buoyant, the wave from the water, the shear force between the boat and the water, and the weight of user/users and their movement on the boat can cause the screw and locating pins to develop fatigue easily. And the screws might be loose or damaged after using it for a short period of time. To eliminate this problem, some more material must be used to reinforce the strength of the screw and locating pins, therefore the boat weight is increased.

[0018] The boat weight itself is an important factor that the user chooses what kind of boat to purchase. From the storage to the vehicle, the vehicle to water, the user normally carries
the boat using his/her own strength. It might be difficult for people that do not have enough strength, for example, some women, elders and disabled. The weight of the boat is important. This design makes the combined boat lighter. For the people that love sports, leisure activities, and fishing, this design is very good to them.

[0019] This designed combined boat can be placed on the back seats or in the trunk of a car. It is easy to transport, saving energy, and it is easy for the users to carry on their own, to assemble and disassemble, and it also saves material usage.

[0020] Also, this designed boat can be assembled or disassembled quickly. This could be very useful when it is under emergency, such as saving lives on the water, general saving, and evacuating, etc.

**DRAWING DESCRIPTION**

[0021] FIG. 1 is the top view of the fastening apparatus of combined boat
[0022] FIG. 2 is the side view of the fastening apparatus of combined boat
[0023] FIG. 3 is the grooves on the combined boat
[0024] FIG. 4 is the semicircle shaped apparatus side view
[0025] FIG. 5 is the semicircle shaped apparatus inside view
[0026] FIG. 6 is the semicircle shaped apparatus lock side view
[0027] FIG. 7 is to show how the separated parts are connected together

**DETAILED OPERATION METHOD**

[0028] The following is an example on how to operate the combined boat with the drawings:

[0029] According to FIGS. 1 to 7, this fastening apparatus is intended to combine the part 1 together tightly. The part 1 contains grooves (3); the fastening apparatus contains holding band (2), and the holding band is made of hard material. Holding band (2) has ridges (4) that match the grooves. The ridges (4) and the grooves (3) are tightly connected together via the holding band to make sure the separated pieces of the boat combined as a whole body.

[0030] Based on the above technology, since the holding band has ridges (4), which matches the grooves (3), and to make sure these two parts are connected together tightly. The closed loop on the holding band (2) connects separated bodies into a whole body. The holding band is made of hard material. The whole structure is simple; since grooves (3) and ridges (4) are mated together, two separated boat bodies are not easily slide away from each other, so the boat is traveling safer and more stable.

[0031] In this example, the boat is combined with three separated bodies. The bodies are connected using the holding bands (2) from each other. If there are more bodies, the same method applies to other bodies and the holding bands on each separated boat body can connected the bodies from one to another.

[0032] In this example, according to FIGS. 4 and 6, the holding band (2) has a connecting part (6) that can be in connecting status or disconnecting status. When the connecting part (6) is at connecting status, separated pieces of boat are connected together; when it needs to be separated, the connecting part (6) is at disconnecting status. The operation of connecting and disconnecting is simple. In this example, the connecting can be a lock. Using this kind of connecting method can set holding band (2) to be at connecting or disconnecting status, to connect the separated boat pieces together or separate them. The connecting part can be other publicly known connecting structures if it can set the holding band (2) at connecting or disconnecting status, which is not further illustrated here.

[0033] In this example, according to FIG. 4, the holding band (2) has chain structure around the edge of the boat body. The chain structure (5) around the edge of the boat benefits the holding band to attach to the body of the boat better, so that two separated bodies are connected together tighter, and the boat is more stable. At the mean while, since the holding band is made of hard material, having the chain structure (5) around the edge of the boat can reduce the wearing down of the hard material, and increase the lifespan of the holding band (2).

[0034] The above illustration is only the theory of this design and a good example of showing how to operate it. It needs to be pointed out that to the technicians in this technology field, based on the theory of the original design, anyone can make more other modified version of this kind of combined boats, which are protected under this patent of design.

1. An apparatus of combined boat and kayak, used to combine the parts of separated parts of a boat and kayak. The characteristics are: grooves are provided at the joints of the boat hulls; the fastening apparatus includes a holding band with ridges mating with the grooves, and the holding band engages via the ridges with the grooves so as to join the boat hulls of the combined boat together securely.

2. As the apparatus described in claim Point 1, the characteristic is: the holding band has a connecting part that can be formed in connecting or disconnecting form.

3. As the apparatus described in claim Point 2, the characteristic is: the connecting part is a lock.

4. As the apparatus described in claim Point 1, 2 or 3, the characteristic is: the holding band has chain structured parts around the edge of the boat.

5. As the apparatus described in claim Point 4, the characteristic is: the holding band is made of hard materials.

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