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(54) Tension hoop for musical drum instrument

(57) The musical drum instrument has a ring-shaped rim (16) with a rectangular cross sectional shape, made of a wooden material such as a plywood. The wooden rim (16) has a plurality of bolt retention sections (17) formed equidistantly around the periphery for supporting tensioning bolts (9). Tensioning bolt (9) is inserted through an opening on the rim surface (16a) formed on a depression section (17A) of each bolt retention section (17). The bolts (9) are engaged with the lugs (8) which are firmly attached to the outer periphery of the shell (1). The bolt heads (9a) of the tensioning bolts (9) are hidden inside the depression sections (17A), because the depth of the depression section (17A) is chosen so that the bolts do not extend beyond the end of the rim surface (16a). A bolt insertion hole (18) passes through the bottom surface of the bolt retention section (17) so as to enable inserting the bolt (9) through the depression section (17A) to be engaged with the lug (8). Because metallic couplers (7) are not used in the present drum, the number of parts are economically reduced. Also, the rim is able to produce natural vibrations enabling it to produce soft and simple sounds, characteristic of wood instruments.

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Description

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates in general to percussion instruments, and relates in particular to a drum with a wooden rim, including other drum types such as a bass drum, snare drum, tum-tum drum, floor drum and marching drum.

This application is based on patent application No. Hei 9-4569 filed in Japan, the content of which is in corporated herein by reference.

Description of the Related Art

As illustrated in a general cross sectional view in Figure 5, musical drums such as bass drum, snare drum, tum-tum drum and marching drum are comprised by a cylindrical shell member 1 made of fiber reinforced plastic (FRP) or metal whose end openings are covered over with a head membrane 2 (2a, 2b) made of natural leather or polymeric resin material such as polyester or polycarbonate resin, which is tensioned by means of a plurality of head tensioning device 3, shown in more detail in Figure 4, to retain a uniform head membrane tension on the battering surface.

Such drums produce drumming sound by the action of an air column, sealed between the two drum heads 2a, 2b, acting as a vibrating medium. Technically, when the front head 2a is struck with a drumstick 4, the vibration from the front head is transmitted to the rear head 2b, through the air column, which in turn transmits the vibration back from the rear head to the front head through the air column. The final sound effects are produced by the mutually induced repetitive vibrations of the two drum heads 2a, 2b.

For optimum performance of the drum, the shell 1 should retain a stable shape without having its shape affected by factors such as weather conditions and tensioning of the drum head 2, be able to minimize off-tuning and be free from self vibration and self absorption effects. As shown in Figure 5, the head tensioning device 3 generally comprises a ring shaped head collar 5 for retaining the outer periphery of the drum head 2, mounted on the outer periphery of the shell 1 near the end opening of the shell 1; ring shaped tensioning collars (referred to as rims hereinbelow) 6 similarly mounted on the outer periphery of shell 1 for compressing on the head collar 5; tensioning couplers 7 for coupling to the rims 6; and tensioning bolts 9 for coupling the tensioning couplers 7 to the lugs 8 fixed to the outer surface of the shell 1. When the tensioning bolts 9 are rotated on screw threads to move the rim 6 in the axial direction, the compressive force exerted by the rim 6 on the head collar 5 is altered, thereby affecting the tension on the drum head 2 and enabling to adjust the drum tone.

However, in the conventional drums with wooden rims 6, the hook 7a of the tensioning couplers 7 are engaged on the periphery of the rims 6 at the open ends of the shell 1, and the tensioning bolts 9 are inserted through the couplers 7 so as to secure the couplers 7 to the lugs 8. However, this method of fastening the head presents a problem that, when metallic couplers 7 are used to press down on the rim 6, the vibration of the wooden rims themselves become suppressed. The vibrational tone of metallic couplers 7, tending to a higher sharper pitch, is different from that of wooden rims 6, and while such a tensioning method may be acceptable for a snare drum which is designed for metallic piercing sound, it is unsuitable for a tum-tum drum intended for simpler and softer sound. In such a combination, the inherent characteristics of the wooden rims are negated and the desirable feature of the wooden musical instrument is diminished. Furthermore, this tensioning arrangement tended to interfere with playing of special effects (so-called rim shot playing) created by striking the batter surface with the tip end 4a of the drumstick 4 simultaneously with tapping of the rim 6 with the middle section of the drumstick 4 (between the tip 4a and the grip section) or by tapping the rim 6, while holding onto the middle section and resting the tip 4a on the front head, with a section of the drumstick 4 nearer to the grip side of the drumstick 4. When performing such rim shot, the drummer has to be careful not to disturb the mood by accidentally hitting the hook 7a of the coupler 7. Additionally, the production cost presents another problem because metallic tensioning coupler 7 are made by bend forming and welding metal strips, and their production costs are rather high.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a drum instrument that does not require metallic couplers for tensioning the head membranes to enable to generate natural vibrations to produce softer, simpler sounds, and that requires lesser number of parts to enable the drum with wooden rims to be produced economically.

The object has been achieved in a musical drum instrument comprising: a head collar coupled to each end opening of a drum shell to retain peripheries of a head membrane; a wooden rim for compressing on each of head collars; and a plurality of tensioning bolts for directly engaging wooden rims with a plurality of lugs firmly attached to an outer periphery of the shell, wherein the wooden rim is provided with a plurality of bolt retention sections for internally housing the tensioning bolts.

The bolt retention section is provided with a depression section which extends away from the lugs so as to retain a bolt head of the bolt in the depression section, and a bolt insertion hold extending towards the lugs formed through a bottom surface of the depression sec-

tion.

The depression section is provided with a depth dimension such as to contain the bolt head completely within the depression section.

The feature of a drum instrument having wooden rims of the present invention is that the wooden rims themselves support the head of the tensioning bolts such that they function as means for engaging the tensioning bolts with the lugs. By eliminating the metallic couplers used in conventional drums, the number of parts required for the drum is reduced. Because the metallic couplers are not used, the wooden rims are able to generate natural vibrations so that softer and simpler sounds can be generated. The present drum instrument eliminates accidental hitting of metallic couplers when performing rim shot. Also, because the heads of the tensioning bolts are completely hidden inside the depression section of the bolt retention sections, there is no opportunity for them to be hit with the drumstick.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a general cross sectional view of a rim section of the present invention for use in a drum instrument.

Figure 2 is another example of the rim section.

Figure 3 is still another example of the rim section.

Figure 4 is an overall cross sectional view of a conventional drum.

Figure 5 is a detailed front view of the tensioning coupler shown in Figure 4.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Preferred embodiments will be presented with reference to the drawings. Those parts which are the same as the conventional drum are referred to using the same reference numerals and their explanations are omitted.

Figure 1 is a cross sectional view of the main sections of a drum instrument having the wooden rim of the present invention. In the present drum, metallic tensioning couplers which have been necessary in the conventional design are not used so that the lugs 8 and the wooden rims 16 can be directly linked with the bolts 9. The rim 16 is a ring shaped frame of a rectangular cross sectional area, and is made of a plywood of nineteen laminations using such material as maple wood. A plurality of bolt retention sections 17, for housing the bolt head 9a of the tensioning bolts 9, are formed at equal intervals around the outer section of the ring frame. The width W of the rim 16 is about 15~20 mm and the height H is chosen to be a size suitable for each drum, in such a way that, when it is attached to the shell 1, the rim 16 projects above the surface of the front head to enable playing of rim shot.

The bolt retention section 17 is provided with a depression section 17A, which has an opening facing towards the rim surface 16a away from the lug 8, so as to hide the bolt head 9a of the tensioning bolt 9. The depth of the depression section 17A is chosen such that the bolt head 9a would not extend beyond the opening. A bolt insertion hole 18 is formed to pass through the bolt retention section 17 so as to open to the depression section 17A as well as to the lug 8 so that the bolt 9 can be inserted therethrough. This design permits the compressive surface 16b to press down onto the head collar 5 by the action of the tensioning bolt 9. To adjust the tension on the drum head 2, a tuning key is inserted into the depression section 17A to engage with the bolt head 9a to turn the bolt 9.

In this example, the rim 16 is made as a ring frame having a uniform width (girth) W, but it is not necessary to limit to such a shape. As illustrated in Figure 2, those sections where the bolt retention sections 17 are to be formed may be extended outward to provide reinforcement, and other regions are formed on a smaller girth. In the example shown in Figure 1, the cross sectional shape of the rim 16 has a rectangular shape with the long dimension extending in the axial direction of the shell 1. Other designs may include such as the one shown in Figure 3, in which the rim surface 16a opposite to the lug 8 has a slanted surface 16c inclined towards the outer periphery so that the cross sectional shape will be trapezoidal.

Such a drum enables the lugs 8 to be fastened directly to the wooden rim 16 without using metallic couplers 7 because the bolt retention sections 17 provided on the rim 16 internally shrouds the bolt 9. Such an arrangement enables to significantly reduce the number of parts and the production cost. Further, because metallic couplers 7 are not used to press down onto the wooden rim 16, the rim 16 itself is able to produce natural vibrations to generate softer sound typical of a wood instrument so that the rims of the present design are ideal for a tum-tum drum. Further, the drum having the rims of the present design demonstrates a superior performance, because metallic couplers 7 are not used, there is no danger of unwittingly hitting a coupler 7 while striking the rim 16 with the drumstick 4. Further, because the bolt heads 9a are completely hidden inside the depression sections 17A, there is no danger of hitting a bolt head 9a with the drumstick 4. Further, the rim 16 is attached to the shell 1 to extend beyond the drum head 2 so that it can be played without experiencing unfamiliar tactile sensation compared with the regular drum with metallic rims.

According to its broadest aspect the invention relates to a musical drum instrument comprising; a head collar 5 coupled to each end opening of a drum shell 1 to retain peripheries of a head membrane 2; a rim 16 for compressing on each of head collars 5; and a plurality of tensioning bolts 9.

Claims

1. A musical drum instrument comprising: a head collar (5) coupled to each end opening of a drum shell (1) to retain peripheries of a head membrane (2); a wooden rim (16) for compressing on each of head collars (5); and a plurality of tensioning bolts (9) for directly engaging wooden rims (16) with a plurality of lugs (8) firmly attached to an outer periphery of said shell (1), wherein said wooden rim (16) is provided with a plurality of bolt retention sections (17) for internally housing said tensioning bolts (9).

2. A musical drum instrument according to claim 1, wherein each of said bolt retention section (17) is provided with a depression section (17A) which extends away from said lugs (8) so as to retain a bolt head (9a) of said bolt (9) in said depression section (17A), and a bolt insertion hole (18) extending towards said lugs (8) formed through a bottom surface of said depression section (17A).

3. A musical drum instrument according to claim 2, wherein said depression section (17A) is provided with a depth dimension such as to contain said bolt head (9a) completely within said depression section (17A).

4. A musical drum instrument comprising: a head collar (5) coupled to each end opening of a drum shell (1) to retain peripheries of a head membrane (2); a rim (16) for compressing on each of head collars (5); and a plurality of tensioning bolts (9).

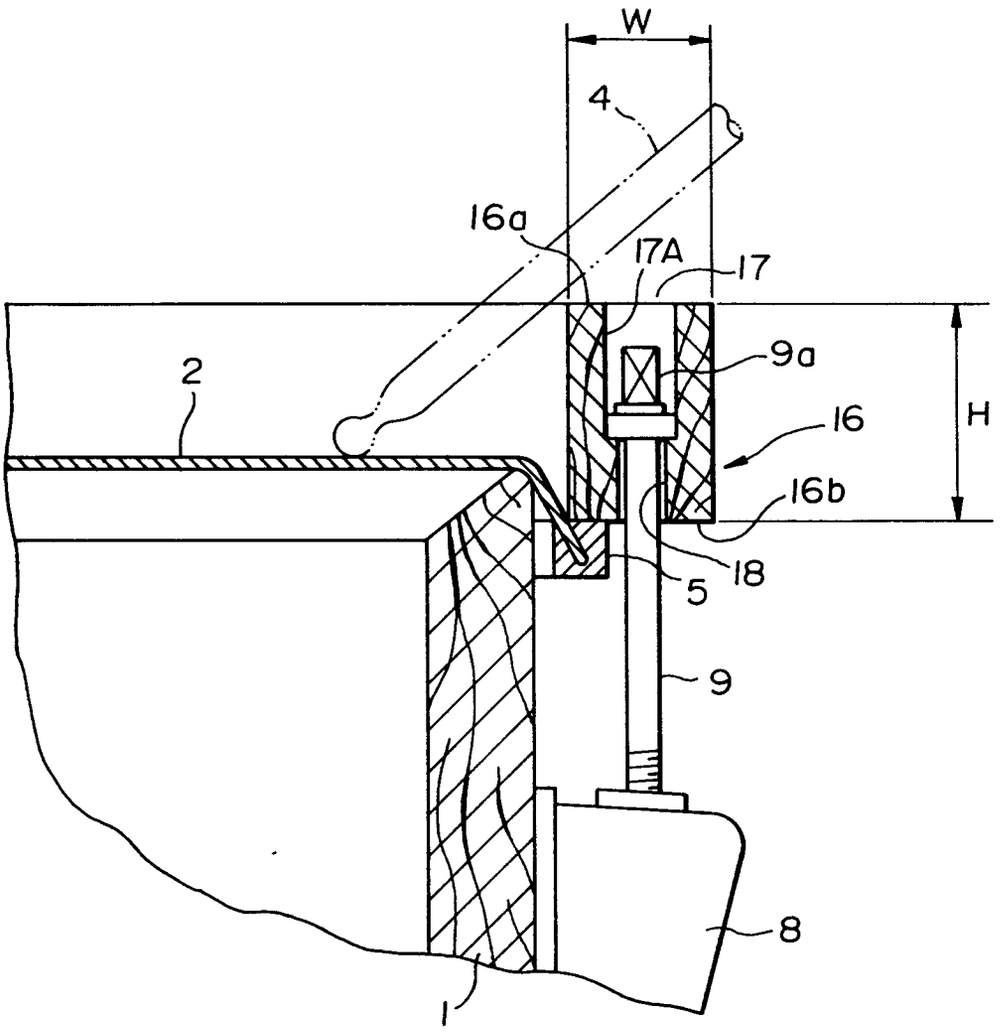


FIG.1

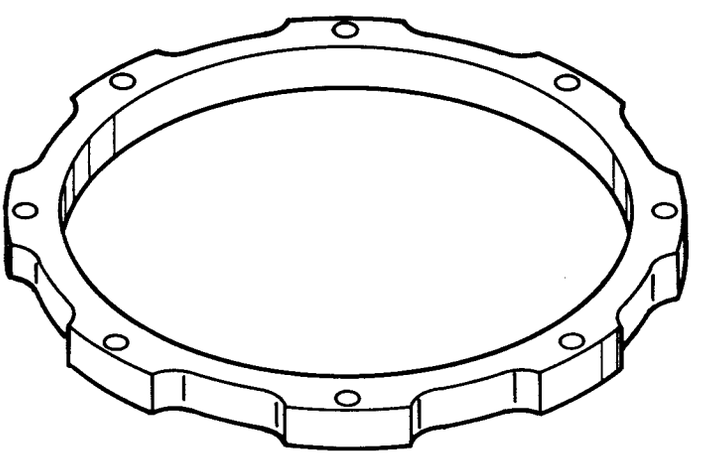


FIG.2

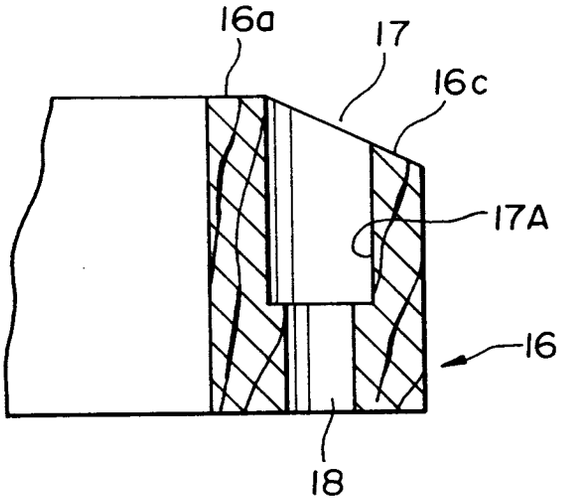


FIG.3

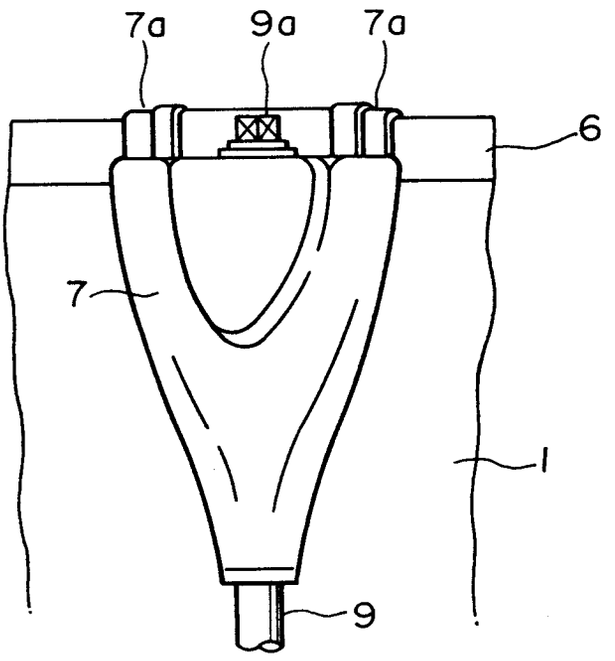
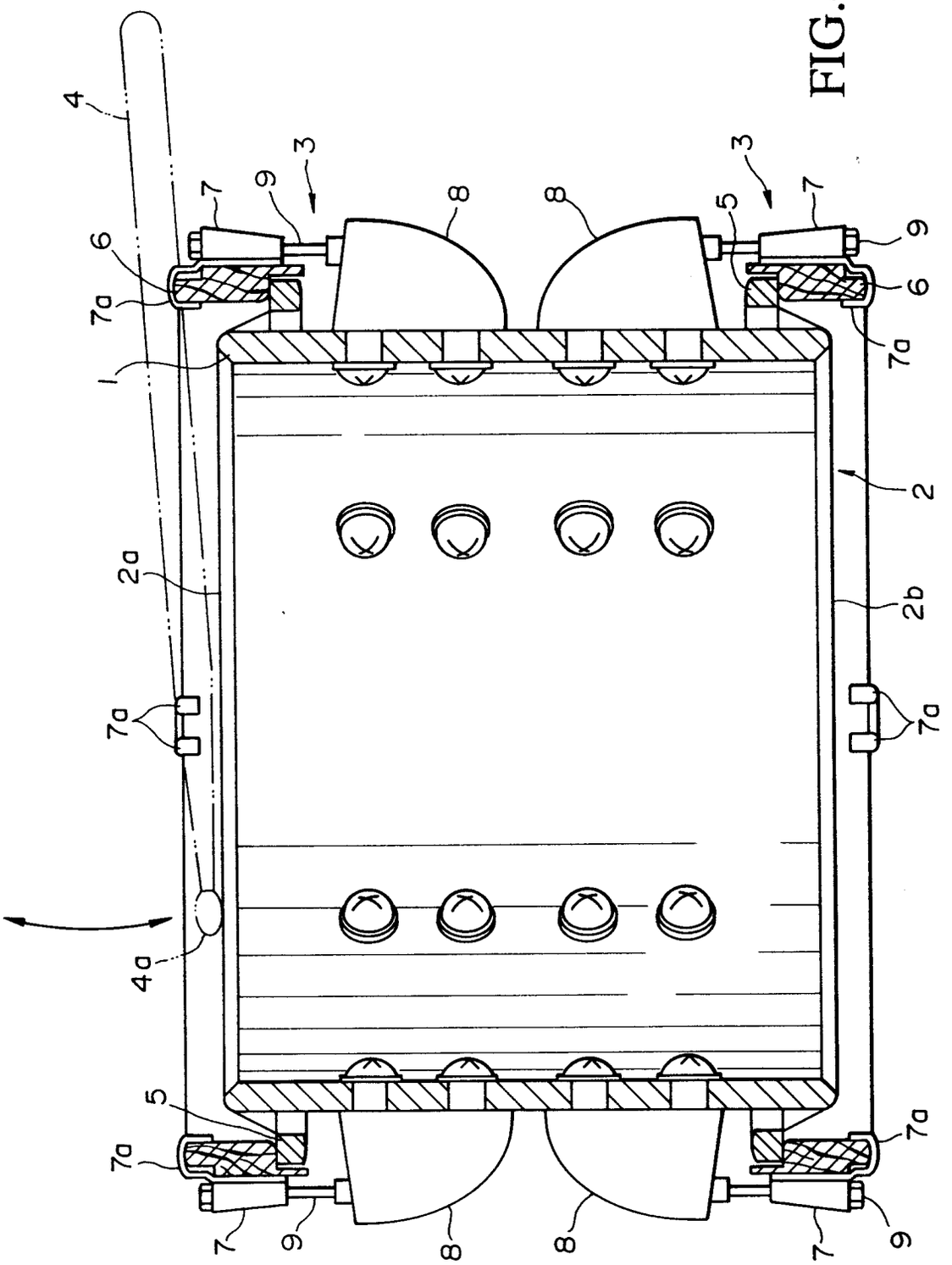


FIG.5

FIG.4



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EUROPEAN SEARCH REPORT

Application Number
EP 98 10 0563

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	US 1 597 026 A (E.L. EGERMAYER) 24 August 1926	1-3	G10D13/02
X	* figures 1,6 *	4	
A	DE 40 01 795 A (LINK JOHS GMBH & CO KG) 25 July 1991 * figures 1,2 *	1	
A	US 4 581 973 A (HOSHINO YOSHIKI) 15 April 1986 * figure 2 *	1	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

G10D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	22 April 1998	Anderson, A

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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