Jan. 9, 1968 YOSHIYUKI KOISHIKAWA 3,362,275

DRUMHEAD CONSTRUCTION

Filed May 9, 1966 2 Sheets-Sheet 1

FIG. 1

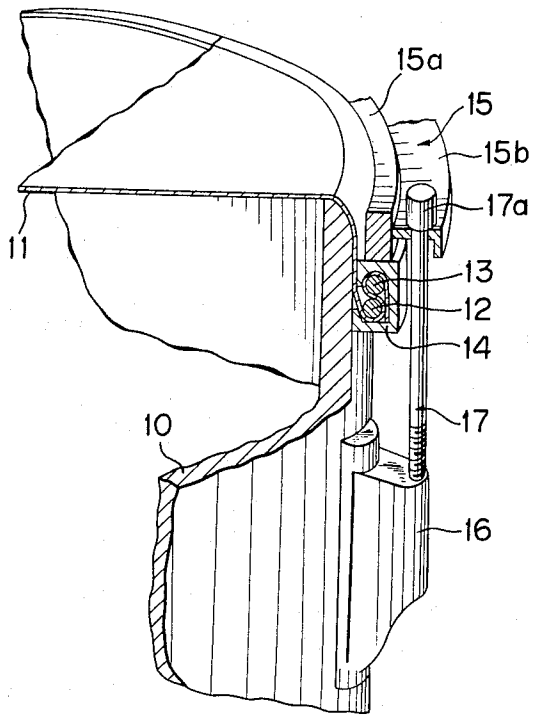


FIG. 2

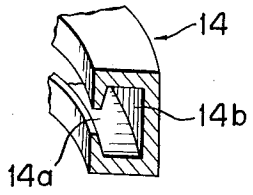


FIG. 3

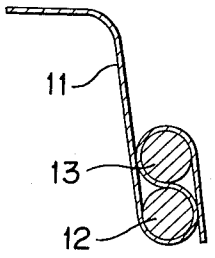


FIG. 4

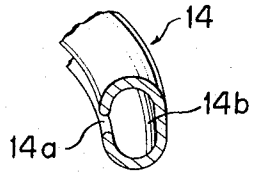


FIG. 5

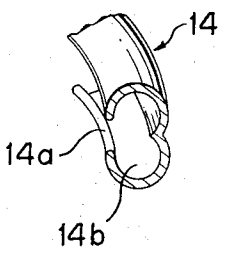
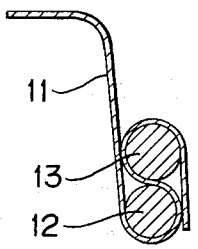


FIG. 6



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DRUMHEAD CONSTRUCTION

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FIG. 7

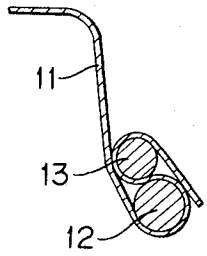


FIG. 8

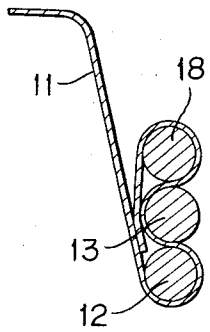


FIG. 9

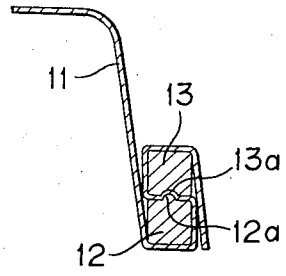


FIG. 10

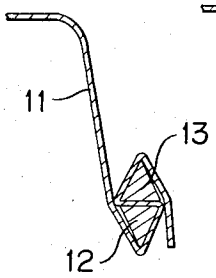


FIG. 11

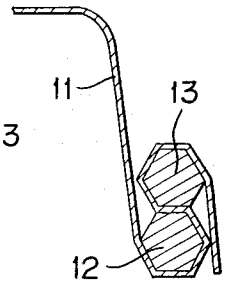


FIG. 12

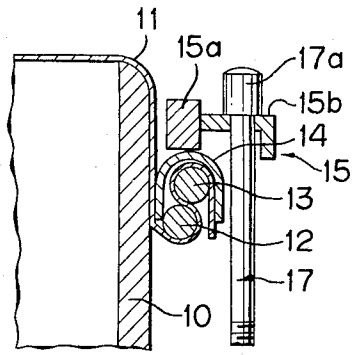


FIG. 13

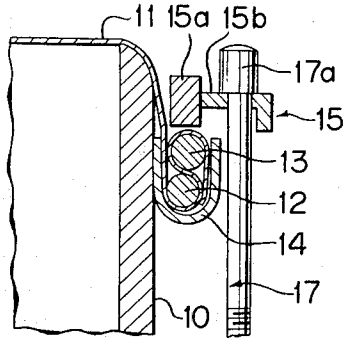
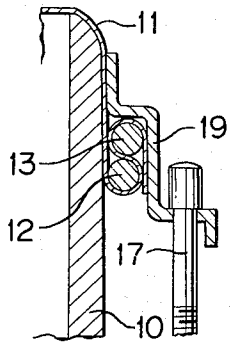


FIG. 14



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3,362,275

DRUMHEAD CONSTRUCTION

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15 Claims. (Cl. 84—411)

ABSTRACT OF THE DISCLOSURE

A drumhead construction which comprises a sheet edge clamping means having at least two superposed ring-shaped clamps around the outer periphery of a drum body, and a drumhead sheet blocked under tension on the edge surface of the drum body, the peripheral edge of said drumhead sheet extending through the ring-shaped clamps from the end of the drum body over which the drumhead sheet is blocked and along the bottom peripheral surface of said lower ring-shaped clamp, then extending along the outer peripheral surface thereof and then over the top peripheral surface of the lower ring-shaped clamp and along the bottom peripheral surface of the next higher ring-shaped clamp, and then extending along the inner peripheral surface of said next higher ring-shaped clamp and then along the top peripheral surface of said next higher ring-shaped clamp so that the peripheral edge of said drumhead sheet is wound in the shape of an S between said at least two superposed ring-shaped clamps, whereby when the construction is mounted on a drum body and the ring-shaped clamps are pressed down along the drum body, the drumhead sheet is held tightly by said ring-shaped clamps.

This invention relates to a drumhead construction.

Heretofore, animal skin has been principally used as a drumhead sheet. Recently, however, as a replacement for said skin, a synthetic resin film, for example, a polyester film has also been in use. Such a synthetic resin film is rich in moisture-resisting property and suitable as a drumhead sheet material. However, its thickness is extremely thin or 0.075–0.35 mm. and it is very slippery, it being apt to break upon anchoring the periphery of the drumhead sheet at the drum body, to slip from the anchoring member and it is difficult to tightly fix the sheet. Because of that, the anchoring means for the drumhead sheet tend to become very complicated.

The present invention has been devised in order to eliminate all these defects. The principal object of the present invention is to provide an improved drumhead construction wherein the drumhead sheet is tightly fixed to the drum body by a simple construction and not damaged by rough use.

One of the other objects of the present invention is to simplify fitting of the drumhead sheet of a slippery synthetic resin film to the drum body, to prevent the occurrence of expansion and contraction of the drumhead sheet due to moisture by the moisture-resisting property of the synthetic resin film constituting the drumhead sheet whereby the drumhead sheet can be always maintained in a uniformly tensioned state.

Another of the objects of the present invention is to provide an improved drumhead construction which is simple and suitable for mass production.

In order to achieve the aforesaid objects of the present invention, the drumhead construction of the present invention comprises a pair of upper and lower ring-shaped clamps to be fitted on the outer periphery of the drum body, a drumhead sheet blocked under tension on the edge surface of the drum body and means to press down said pair of ring-shaped clamps, characterized in that the periphery of said drumhead sheet is wound on the lower

outer periphery of said lower ring-shaped clamp, the edge of said drumhead sheet is held at the contact point between the upper and lower clamps, the edge part of said drumhead sheet is wound on the upper outer periphery of said upper ring-shaped clamp and the periphery of said drumhead sheet as a whole is wound in the shape of S between said clamps.

In the drumhead of the present invention, because the periphery of the drumhead sheet blocked under tension on the edge of the drum body is wound on the lower periphery surface of the lower ring-shaped clamp fitted on the outer periphery of the drum body, thereafter the edge of the drumhead sheet is held at the contact point between the upper ring-shaped clamp and the lower ring-shaped clamp, further the free end of the drumhead sheet is wound on the outer peripheral surface of the upper ring-shaped clamp, thus the periphery of said drumhead sheet is wound in the shape of S between said upper and lower ring-shaped clamps, the friction resisting force between the periphery of the drumhead sheet and the other peripheral surfaces of the up and down ring-shaped clamps to act effectively against pulling out of the drumhead sheet from said up and down clamps increases, said drumhead sheet is simply and uniformly anchored throughout its entire periphery between said up and down clamps and does not easily relax and does not break when the drumhead sheet is tensioned. Further by pressing down the both clamps by said means to press down said ring-shaped clamps the drumhead sheet is uniformly tensioned and no wrinkle is brought about on the surface of the drumhead sheet. Accordingly, there is no fear that the sound tone goes out of order.

Other objects and advantages of the present invention will become clear from the description of the following embodiments.

In the drawings:

FIG. 1 is a fragmentary perspective view in longitudinal section of an important part of an embodiment.

FIG. 2 is a fragmentary perspective view in transverse section of an annular cover used in the embodiment of FIG. 1.

FIG. 3 is a transverse section of a periphery anchoring part of the drumhead sheet of the embodiment of FIG. 1.

FIGS. 4 and 5 are perspective views in partial transverse section showing other embodiments of the cover shown in FIG. 2.

FIGS. 6–11 are transverse sections showing other embodiments of the periphery anchoring part of the drumhead sheet.

FIGS. 12–14 are transverse sections showing other embodiments of the drumhead construction according to the present invention.

In FIG. 1, **10** is a drum body, the end opening of which is blocked by a drumhead sheet **11** made of a synthetic resin film like a polyester film or an animal skin, and the periphery of the drumhead sheet is held between a lower ring-shaped clamp whose section is round **12** and an upper ring-shaped clamp whose section is round and whose diameter is same as that of the lower ring-shaped clamp **13**.

FIG. 3 shows a detail of an anchoring part of the periphery of the drumhead sheet **11**, wherein the periphery of the drumhead sheet **11** is pulled downwardly along the periphery of the upper end opening of the drum body **10**, the lower edge of the drumhead sheet **11** is wound along the lower peripheral surface of the lower ring-shaped clamp **12**, the edge of the drumhead sheet **11** is held between the contact point between the upper and lower clamps **12**, **13**, further the edge is wound along the upper periphery surface of the upper ring-shaped clamp **13**, thus said drumhead sheet is wound in the shape

of S between the upper and lower ring-shaped clamps and held therebetween. At this time it is good to frictionally contact the outer peripheral surface of the drumhead sheet 11 wound on the upper ring-shaped clamp 13 with the part of the drumhead sheet 11 located on the outer peripheral surface of the drum body 10 thereby increasing the resistance against pulling out of the drumhead sheet 11 from the ring-shaped clamps 12, 13.

14 is an annular cover having a cross section in the shape of a groove and made of a material high in strength, durability and elasticity such as vinyl chloride and nylon, in whose internal periphery is provided an opening 14*a* in the direction of the periphery. The upper and lower ring-shaped clamps 12, 13 holding the periphery of the drumhead sheet 11 are forcibly inserted through the opening 14*a* into a hollow portion 14*b* of said annular cover by taking advantage of the elasticity thereof.

As occasion demands, an adhesive may be filled in the hollow portion 14*b* of said cover 14.

15 is a means to press down said clamps 12, 13, the lower end of whose interior annular piece 15*a* contacts the upper surface of the upper flange of the cover 14, an exterior annular piece 15*b* projecting horizontally from the outer periphery of said interior annular piece 15*a* has a threaded rod 17 threaded through a threaded hole of a part projecting from the periphery of the drum body and by turning the rod 17, the exterior annular piece 15*b* of said means to press down is pressed by the top of the screw rod 17*a*, and said cover 14 in whose hollow portion is held the ring-shaped clamps holding the periphery of the drumhead sheet is pressed down whereby the drumhead sheet 11 is so tensioned as to close the edge opening of the drum body 10 and the drumhead sheet 11 is held tightly on the drum body 10.

Said drumhead sheet 11, the ring-shaped clamps 12, 13 and the annular cover 14 constitute a drumhead, and said drumhead is constituted separately from the drum body 10. Accordingly, said drumhead and the drum body can be separately transported and said drumhead can be easily fitted on the drum body 10 at a desired location. At the time of assembling, the opening 14*a* in the interior peripheral surface of the annular cover 14 contacts the outer periphery of the drum body 10 without being exposed outwardly, and at the same time, the flange parts and a web part of said cover 14 cover said two ring-shaped clamps 12, 13 and the periphery of the drumhead sheet 11 held thereby, making the appearance of the drum very good.

FIG. 4 shows another embodiment of the cover, wherein the annular cover having an opening 14*a* in its interior peripheral surface in the direction of periphery 14*a* and a hollow portion 14*b* inside, has a sectional area in the shape of a C to increase the contact area with said two ring-shaped clamps 12, 13 in order to more tightly hold said clamps.

In an embodiment shown in FIG. 5, the annular cover 14 having an opening 14*a* in its interior peripheral surface in the direction of periphery and a hollow portion 14*b* inside, has a sectional area in the shape of a 3 in order to further tightly hold said ring-shaped clamps 12, 13. Each of said covers shown in FIGS. 4 and 5 is made of a material high in strength, durability and elasticity as in the covers shown in FIGS. 1 and 2.

In an embodiment shown in FIG. 6, the upper ring-shaped clamp has a diameter larger than that of the lower ring-shaped clamp to increase the contact area of the drumhead sheet 11 with the upper ring-shaped clamp.

In an embodiment shown in FIG. 7, the axial centers of the upper and lower ring-shaped clamps are eccentric in a longitudinal direction, and at the same time, the diameter of the lower ring-shaped clamp is made larger than that of the upper ring-shaped clamp to increase the contact area of the periphery of the drumhead sheet 11 with the lower ring-shaped clamp 12.

In an embodiment shown in FIG. 8, an additional ring-shaped clamp 18 is provided above the upper ring-shaped clamp 13, whereby the periphery of the drumhead sheet 11 is wound in a zigzag state along the clamps 12, 13 and 18.

In an embodiment shown in FIG. 9, said clamps 12, 13 have square sectional areas and at the contact area of the clamps 12 and 13, mutually engaging projection 12*a* and concavity 13*a* are provided to wind the periphery of the drumhead sheet 11 in the shape of an S between said two clamps 12, 13, and at the same time, a part of the drumhead sheet 11 is held between said projection 12*a* and concavity 13*a* to more certainly prevent the pulling out of the drumhead sheet 11 from said two clamps 12, 13.

In an embodiment shown in FIG. 10, the ring-shaped clamps 12, 13 have triangular sectional areas, whereas in an embodiment shown in FIG. 11, the ring-shaped clamps 12, 13 have hexagonal sectional areas.

In the embodiments of said FIGS. 9–11, by making the ring-shaped clamps with polygonal sectional areas, strong frictional resistance against the pulling out of the drumhead sheet 11 is brought about at their edge lines.

In an embodiment shown in FIG. 12, the cover 14 consists of a metal piece whose sectional area is in the shape of an inverted U, while in an embodiment shown in FIG. 13, the cover 4 consists of a metal piece whose sectional area is in the shape of an upright U.

In both of the aforesaid two embodiments, the parts the same as those in the embodiment in FIG. 1 are given the same reference numerals.

In an embodiment shown in FIG. 14, 19 is an annular cover and means to press down having the combined actions of the cover 14 and the annular means to press down 15 in the embodiments shown in FIGS. 1, 12 and 13.

The present invention has been described in connection with its preferred embodiments. However, many modifications thereof are included without departing from the inventive concept, which is limited only by the scope of the appended claims.

What is claimed is:

1. A drumhead construction which comprises a sheet edge clamping means having at least two superposed ring-shaped clamps around the outer periphery of a drum body, a drumhead sheet blocked under tension on the edge surface of the drum body, and means engaging with said clamping means to press said pair of ring-shaped clamps down along the drum body, the peripheral edge of said drumhead sheet extending through the ring-shaped clamps from the end of the drum body over which the drumhead sheet is blocked and along the bottom peripheral surface of said lower ring-shaped clamp, then extending along the outer peripheral surface thereof and then over the top peripheral surface of the lower ring-shaped clamp and along the bottom peripheral surface of the next higher ring-shaped clamp, and then extending along the inner peripheral surface of said next higher ring-shaped clamp and then along the top peripheral surface of said next higher ring-shaped clamp so that the peripheral edge of said drumhead sheet is wound in the shape of an S between said at least two superposed ring-shaped clamps.

2. A drumhead construction as claimed in claim 1 in which the ring-shaped clamps have a round cross section.

3. A drumhead construction as claimed in claim 1 in which the ring-shaped clamps have a triangular cross section.

4. A drumhead construction as claimed in claim 1 in which the ring-shaped clamps have a square cross section.

5. A drumhead construction as claimed in claim 1 in which the ring-shaped clamps have a hexagonal cross section.

6. A drumhead construction as claimed in claim 1 in which said ring-shaped clamps have cross sectional shapes which are different sizes.

7. A drumhead construction as claimed in claim 1 in which one of said ring-shaped clamps has a projection on the peripheral surface thereof opposed to the other, and the other ring-shaped clamp has a recess in the peripheral surface thereof opposed to said projection for receiving said projection.

8. A drumhead construction as claimed in claim 1 in which said clamping means includes a third ring-shaped clamp superposed on said ring-shaped clamps, and the peripheral edge of said drumhead sheet extends along the bottom peripheral surface of said third ring and then along the outer peripheral surface thereof and over the top peripheral surface of said third ring.

9. A drumhead construction as claimed in claim 1 in which said clamping means further includes a hollow annular cover member over said ring-shaped clamps and the peripheral edge of said drumhead sheet wound thereon, said annular cover member having a peripheral opening therein extending all the way around the periphery thereof through which said ring-shaped clamps and the peripheral edge of said drumhead sheet are inserted into said cover member.

10. A drumhead construction as claimed in claim 9 in which said cover member has a C-shaped cross section.

11. A drumhead construction as claimed in claim 9 in which said cover member has a cross section in the shape of a 3.

12. A drumhead construction as claimed in claim 9 in which said cover member has a cross section in the shape of a downwardly opening U.

13. A drumhead construction as claimed in claim 9 in which said cover member has a cross section in the shape of an upwardly opening U.

14. A drumhead construction as claimed in claim 9 in which said annular cover member also forms part of said engaging means.

15. A drumhead construction which comprises a sheet edge clamping means having at least two superposed ring-shaped clamps around the outer periphery of a drum body, and a drumhead sheet blocked under tension on the edge surface of the drum body, the peripheral edge of said drumhead sheet extending through the ring-shaped clamps from the end of the drum body over which the drumhead sheet is blocked and along the bottom peripheral surface of said lower ring-shaped clamp, then extending along the outer peripheral surface thereof and then over the top peripheral surface of the lower ring-shaped clamp and along the bottom peripheral surface of the next higher ring-shaped clamp, and then extending along the inner peripheral surface of said next higher ring-shaped clamp and then along the top peripheral surface of said next higher ring-shaped clamp so that the peripheral edge of said drumhead sheet is wound in the shape of an S between said at least two superposed ring-shaped clamps, whereby when the construction is mounted on a drum body and the ring-shaped clamps are pressed down along the drum body, the drumhead sheet is held tightly by said ring-shaped clamps.

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