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Greenville, S.C.
 Continuation of application Ser. No.
 866,223, Oct. 14, 1969, now abandoned.
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 64,151

[50] Field of Search..... 181/33,
 33.4, 33.6, 33.7; 139/1; 57/1

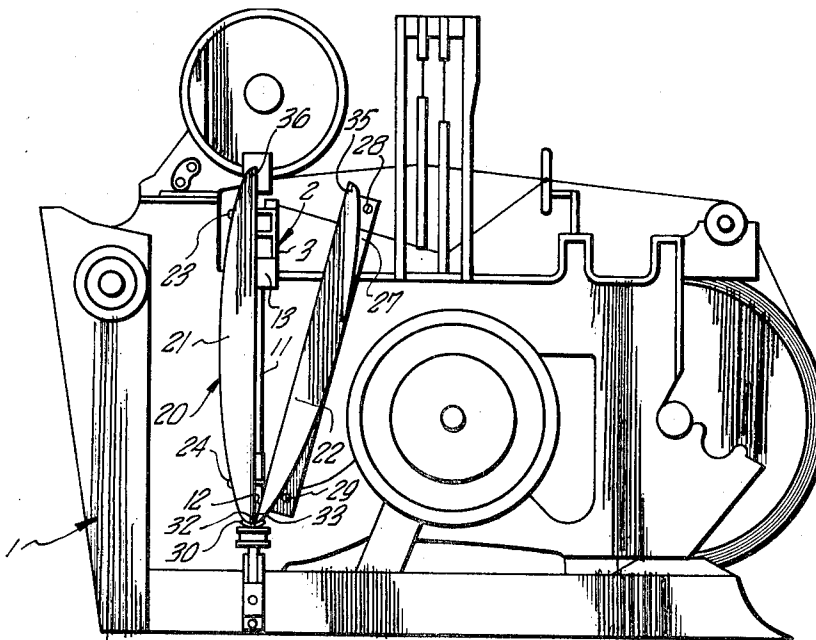
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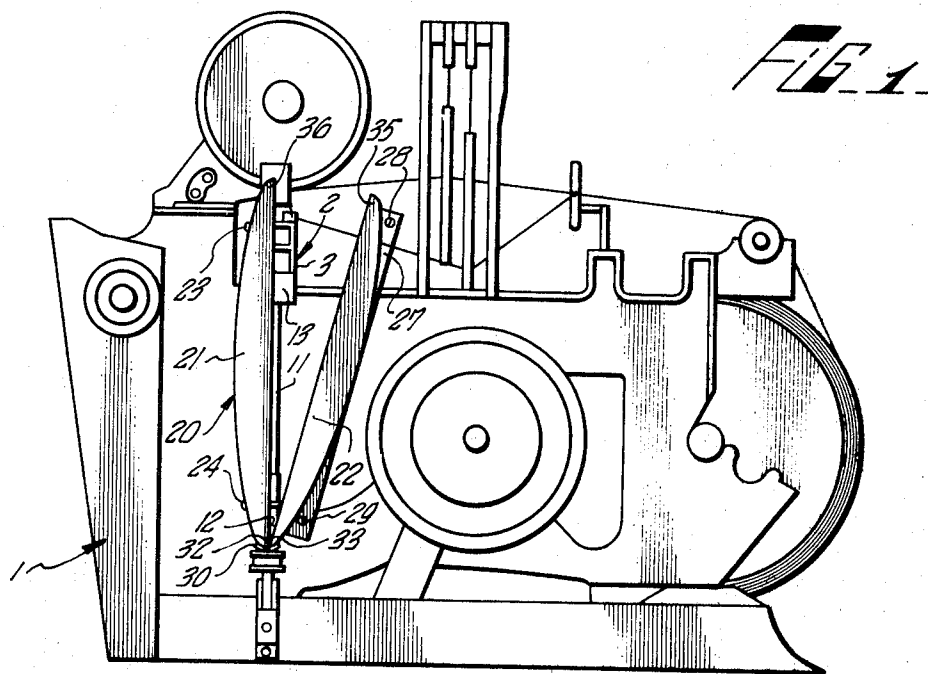
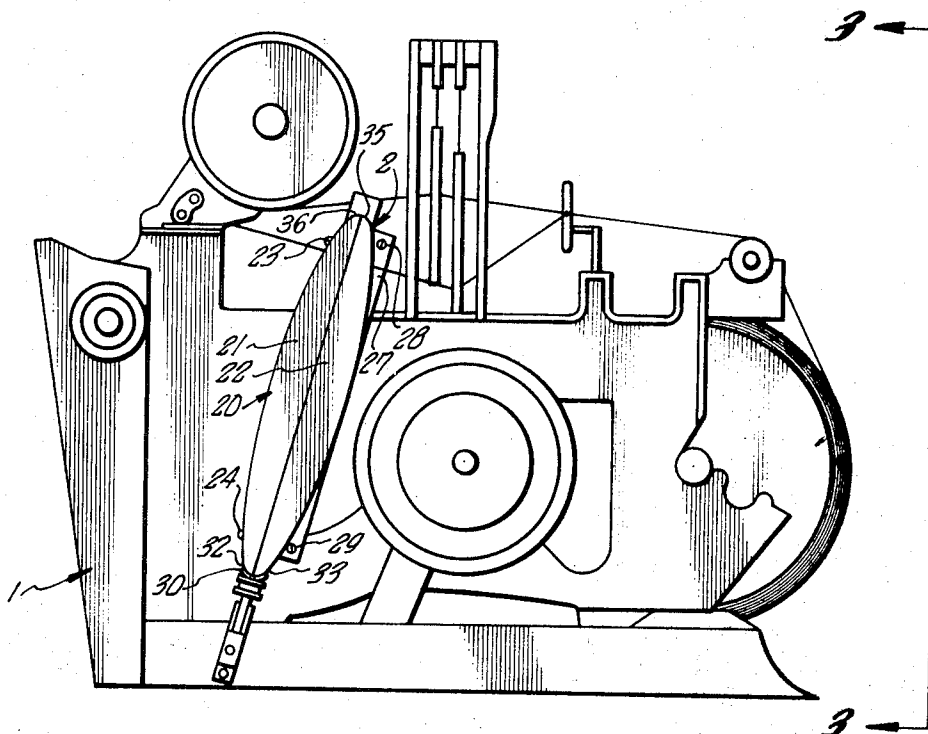
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[54] **NOISE SUPPRESSION ASSEMBLY**
 17 Claims, 6 Drawing Figs.

[52] U.S. Cl..... 181/33 K,
 139/1
 [51] Int. Cl..... G10k 11/00,
 D03d 49/02

ABSTRACT: A noise suppression assembly adapted for use with a shuttle loom or a weaving machine. The assembly includes a pair of plates which are to be mounted on the loom, one of the plates being mounted on the lay and the other on the frame of the loom. The plates have a sound-absorbing material secured to the inner surface.





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FIG. 3.

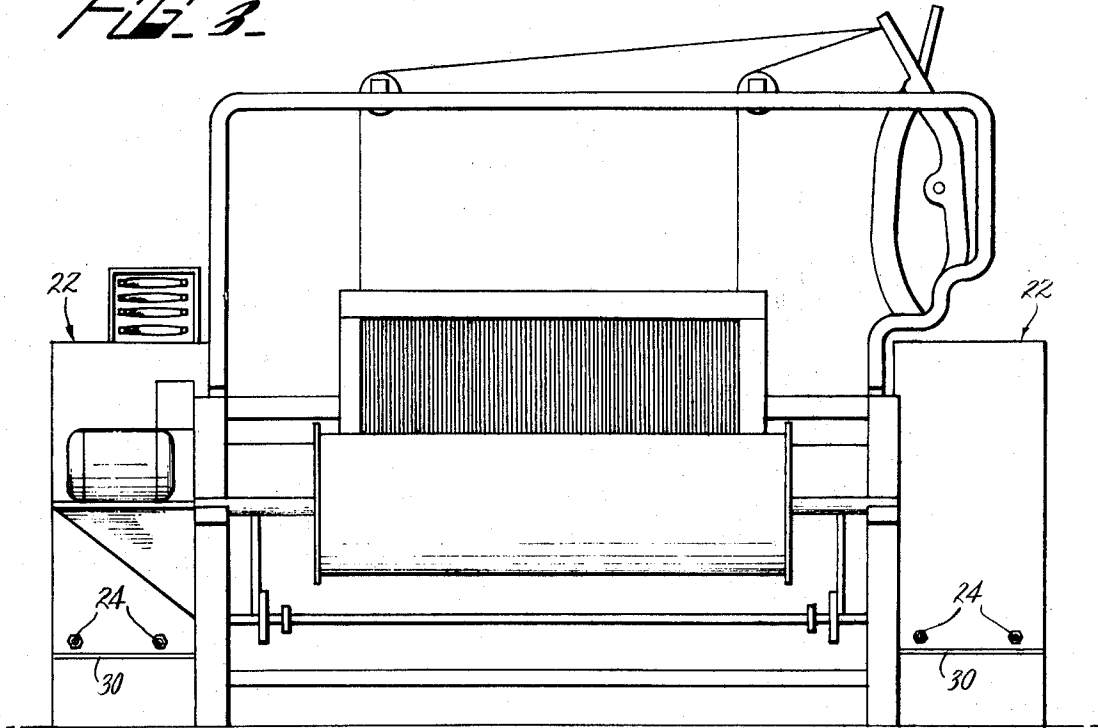
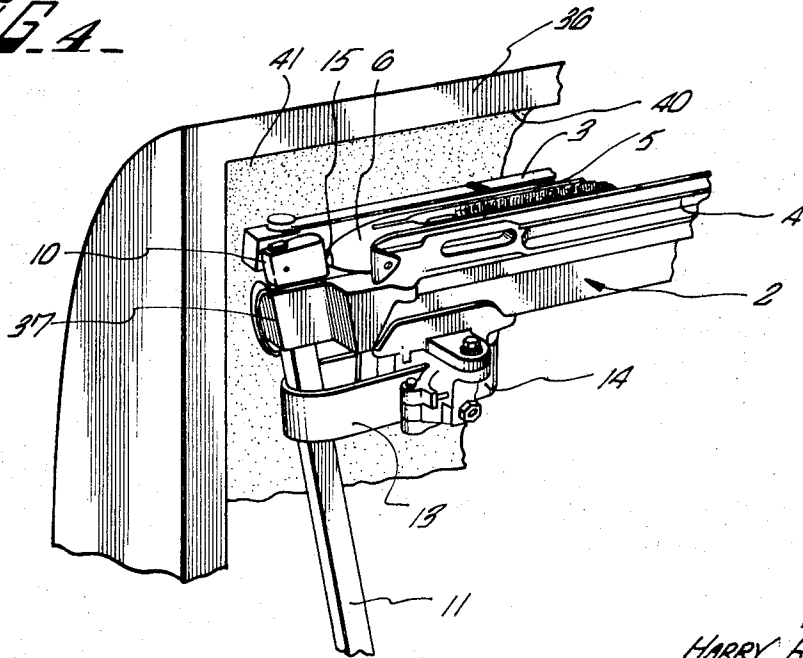


FIG. 4.



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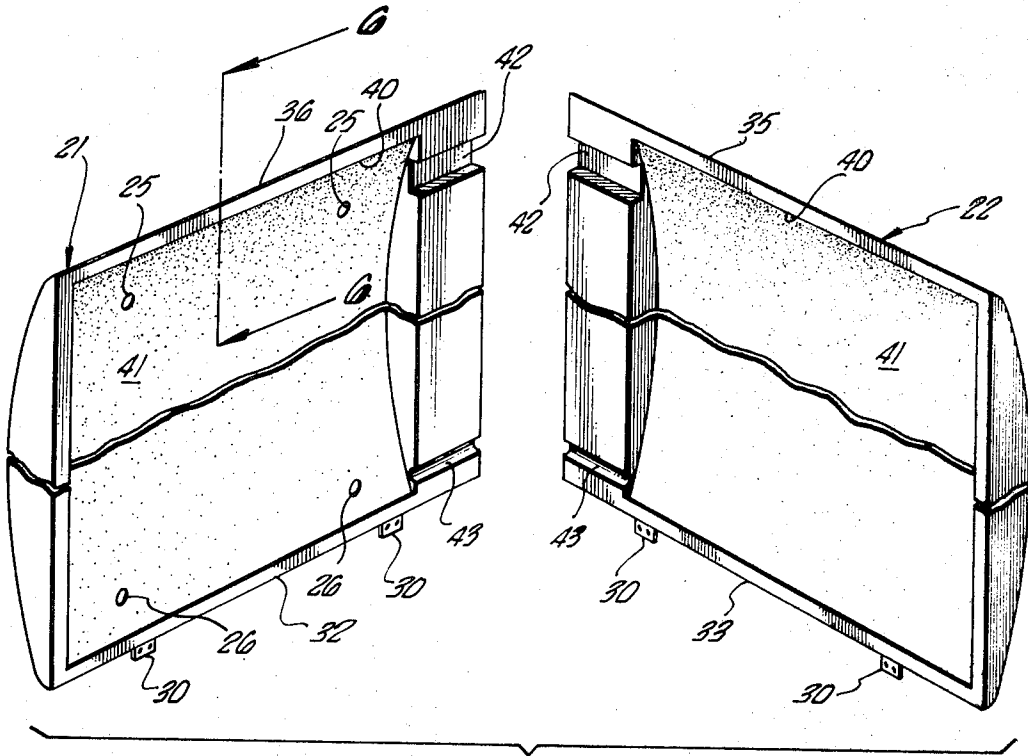


FIG. 5.

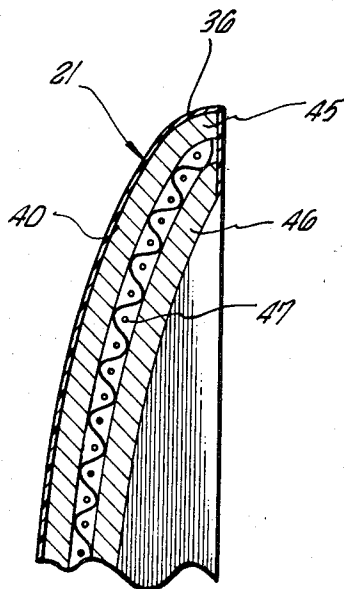


FIG. 6.

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NOISE SUPPRESSION ASSEMBLY

This application is a continuation of application Ser. No. 866,223, filed Oct. 14, 1969, and now abandoned.

BACKGROUND OF THE INVENTION

Shuttle looms and weaving machines have, of course, been used extensively in the textile industry for many years. The loom is a basic and essential machine for the production of fabric from yarn. In the operation of a shuttle loom, as is well understood, warp yarns are fed from a beam or creel through harness, heddles, reed, lay and takeup where they are contacted by a shuttle which moves across the lay carrying "filling" yarn which is interwoven among the warp yarns. To propel the shuttle across the lay and also to stop the shuttle and prevent it from going beyond the end of the lay, the loom includes a picker on each side of the lay carried by a stick or arm which is movably connected to the loom. As might be expected, the contact between the shuttle and the picker creates considerable noise. Since even a small mill may have 100 or 500 or more looms operating at the same time, the noise level can easily become excessive, in some instances on the order of 102 decibels or higher.

Although the threshold of pain in noise is about 120 decibels, injury is possible above 80 decibels and is believed to be almost certain at 90 and above. In a textile mill, a worker in a weave room may require as much as 24 hours to regain normal hearing after working an 8-hour shift, and after working 1 year in an average weave room, normal hearing may never be regained.

The problem of noise level in textile mills is well known and has been the subject of extensive government investigation and concern. The U.S. Department of Labor has issued regulations setting the upper noise level limit at 90 decibels. It is thus imperative that means be provided for suppressing or eliminating the noise produced by operation of the shuttle loom.

One approach which has been used in the past to reduce the noise level in the weave room has been to install acoustical panelling in the ceiling and the walls. While this reduces the noise somewhat, it is not adequate to attain the level of 90 decibels or less. Moreover, since the major source of the noise in the weave room is the loom itself, it is necessary to approach the noise problem from that standpoint, i.e., to modify the loom to suppress the noise when created.

SUMMARY OF THE INVENTION

It is principal objective of the present invention, therefore, to provide an assembly for modification of a conventional shuttle loom to suppress the noise caused by contact between the shuttle and picker. This is accomplished by the provision of a pair of plates which are to be mounted on the loom, one plate being mounted on the lay and the other on the frame of the loom. A resilient material is secured to the inner surface of the plates to assist in dampening or suppressing the noise.

It is also an object of the present invention to provide an improved shuttle loom having a noise suppression assembly mounted thereon.

A further object of this invention is the provision of a noise suppression assembly of relatively simple construction which can be mounted on the loom with a minimum of time and effort.

Yet another object of this invention is the provision of a noise suppression assembly which not only suppresses noise caused by contact between the shuttle and picker of the shuttle loom, but also permits access to the lay. An additional object of this invention is to provide a noise suppression assembly which also permits release of heat generated during operation of the loom.

Other objects, features and advantages will be apparent to those skilled in the art after a reading and understanding of the following more detailed description.

DESCRIPTION OF PREFERRED EMBODIMENTS

In the drawings:

FIG. 1 is a side elevation view of a shuttle loom illustrating the lay and noise suppression assembly with the lay on front center;

FIG. 2 is a side elevation view showing the lay and noise suppression assembly closed with the lay on back center;

FIG. 3 is a rear view of the loom taken on line 3—3 of FIG. 2;

FIG. 4 is an enlarged fragmentary perspective view of the shuttle, picker and noise suppression assembly;

FIG. 5 is a perspective view of the noise suppression assembly; and

FIG. 6 is a fragmentary sectional view taken on line 6—6 of FIG. 5 showing one form of the noise suppression assembly.

Referring now to the drawings, and more particularly to FIGS. 1—4 thereof, a conventional shuttle loom, such as a Draper loom, is designated generally by the numeral 1. Since both the loom and its operation are conventional, for the sake of brevity, the description herein will be limited to the features to which the present invention is most directly related.

The loom includes a lay 2 movable from a back center position (FIG. 2) to a front center position (FIG. 1) in the usual manner. The lay includes a back box plate 3 mounted on the back side of its upper surface at the end thereof and a front box plate 4 mounted on the front side of its upper surface, with box 5 formed therebetween in which the shuttle 6 is caught and retained at the ends of the lay. A picker 10 is supported on the picker stick 11, which is pivotally connected to the loom about shaft 12. A check strap 13 extends about the picker stick and is secured to the lay 2 at 14. As can be seen most clearly in FIG. 4, the picker 10 is positioned at the end of the lay 2 and contacts shuttle spur 15, which is normally metallic, when the shuttle is at that end of the lay. Movement of the shuttle across the lay is thus stopped by contact with the picker and the shuttle is prevented from traveling beyond the end of the lay. The picker, acting through movement of the picker stick, serves to propel the shuttle across the lay to the opposite side. It is, of course, to be understood that the lay thus far described is conventional and includes a picker, picker stick, check strap, etc., on both sides thereof.

The loom also includes a noise suppression assembly designated generally by the numeral 20 mounted thereon. The assembly comprises a pair of plates 21 and 22, plate 21 being mounted on the lay as for example by bolts 23 and 24 which extend through holes 25 and 26 respectively. The plate 21 thus moves with the lay and extends above the front box plate 4 to enclose the same. The second plate 22 includes a flange 27 and is mounted on the frame of the loom by bolts 28 and 29 which extend through the flange and is thus stationary. Plates 21 and 22 are hinged together as at 30 so that the lower edges 32 and 33 are retained together about the shaft 12 and the picker assembly at its lower end. The edges 32 and 33 are thus adjacent one another when plates 21 and 22 are closed at the time the lay is on back center.

The upper surface 35 of plate 22 is positioned, as shown in FIG. 2, so as to be adjacent the upper surface 36 of the plate 21 when the lay is in its back center position. The plates 21 and 22 thus enclose the front and back box plates, lay end plate 37, the picker assembly and the shuttle when the shuttle spur contacts the front and back box plates and the picker, thereby suppressing the noise created by such contact and by the contact between the picker and the lay end plate. Since plate 22 is stationary, however, when the lay 2 is in its front center position, the upper surface 35 of plate 22 is separated from the upper surface 36 of plate 21, as shown in FIG. 1, to permit the release of heat generated during operation of the lay, to permit access to the lay, and also to transfer a full bobbin into the shuttle.

Referring now to FIGS. 5 and 6, the construction of plates 21 and 22 is shown in more detail. The plates are preferably semirigid, heat- and shock-resistant plastic such as polyvinyl chloride, when may be made to conform to the contours of the parts of the loom and have noise-reducing properties to improve the effectiveness of the noise suppression assembly. The plates are of similar construction except for flange 27 of plate

22, and include a slightly concaved inner surface 40. To improve the effectiveness of the noise suppression assembly, a resilient insulating or soundproofing material 41 is secured to the inner surface of the plates. The plates include cutouts 42 and 43 adjacent the upper and lower surfaces respectively which permit the plates to fit over the lay, pick shaft, lug connector and other moving parts of the loom frame (as shown by the broken lines in FIG. 3). The inner surfaces 41 also preferably conform to the parts of the loom to keep the parts thereof clean and thus enhance the operation of the loom. The plates also, of course, must not interfere with proper operation of the moving parts of the lay and pick motion.

The sound-absorbing material is preferably a foamed plastic, such as a flexible or semirigid foamed polyurethane or foamed polyvinylchloride, such as that available from Phillips Foscue Company, secured to the inner surface of the plates by a suitable adhesive, such as a contact cement of U.S. Plywood Company. Foamed polyurethane is a preferred insulating material because of its excellent ability to absorb sound, but other materials can also, of course, be used, such as the tar and fibrous deadening material used for automobile undercoating.

The noise-absorbing media is preferably flexible enough to conform to the operating loom parts but rigid enough so that when bonded to plates 21 and 22 it will not shed, tear, or change shape so as with age, to interfere with the proper operation of the loom. The noise-absorbing material which is used within the enclosures 21 and 22 should preferably have a closed cell structure so that the noise cannot penetrate the inner layer and cause the sound waves to contact the shell structure 20 and 21, thereby making the outer shell structure a sounding board or amplifier for the noise.

In one preferred form, as shown in FIG. 6, the foamed insulating material is a laminate of layers 45 and 46 of the foamed material with a wire backing 47 secured therebetween. The wire backing can be secured to the foamed material by a suitable adhesive, such as the contact cement referred to above. One advantage of the laminated construction is that the foamed material can be shaped to conform in a more permanent manner to the inner surface of plates 21 and 22 and also with the configuration of the lay and the picker assembly.

It will thus be seen that a highly suitable assembly has been provided to suppress the noise created by contact between the shuttle and picker of the conventional shuttle loom, the assembly is readily mountable on the loom without requiring significant modification of the loom, is also capable of mounting with a minimum of time and effort. It will also be appreciated that the assembly serves to suppress the noise when created by the loom and thus is an effective device for lowering noise in a textile mill to a tolerable level.

I claim:

1. In a shuttle loom having a lay mounted thereon, front and back box plates mounted on the upper surface of said lay thus forming a box for a shuttle to transverse said lay, and means movably mounted on said loom having one end positioned in communication with said box adjacent the end of said lay to stop the movement of such shuttle across said lay and to propel the shuttle thereacross, the improvement comprising means connected to said loom to suppress the noise caused by contact between such shuttle and said movably mounted means, said noise suppression means comprising a first plate mounted on said lay enclosing said front box plate and said movably mounted means, and a second plate mounted on said loom in a stationary position having its lower edge adjacent the lower edge of said first plate and its upper surface positioned so as to be adjacent the upper surface of the said first plate and enclose the back of said lay when said lay is in its back center position, whereby the end of said lay and said box are enclosed between said first and second plates when the shuttle contacts said movably mounted means but said first and second plates are separated when said lay is in its front

center position to permit the release of heat and access to said lay.

2. The loom of claim 1 wherein said first and second plates of said noise suppression means have a layer of soundproofing material secured to the inner surface thereof.

3. The loom of claim 2 in which said soundproofing material is a foamed polyurethane.

4. The loom of claim 2 in which said soundproofing material has a wire backing secured thereto.

5. The loom of claim 2 in which said soundproofing material is a laminate of a wire backing secured between layers of said soundproofing material.

6. The loom of claim 2 in which said soundproofing material is a closed cell foamed plastic.

7. In a shuttle loom including a lay with front and back box plates mounted on the upper surface thereof thus forming a box therebetween, and a picker assembly including a picker and picker stick movably mounted on said loom having said picker positioned in communication with said box adjacent the end of said lay to propel a shuttle across said lay and to stop movement of a shuttle, the improvement comprising noise suppression means connected to said loom comprising a first plate mounted on said lay enclosing said front box plate and said picker assembly and a second plate mounted on said loom in stationary position, the lower edge of said second plate positioned adjacent the lower edge of said first plate and the upper surface of said second plate positioned so as to be adjacent the upper surface of said first plate and enclose the back of said lay when said lay is in back center position, whereby the end of said lay, said box and said picker are enclosed between said first and second plates when a shuttle contacts said picker, thus suppressing the noise caused by such contact, but said first and second plates are separated when said lay is in its front center position to permit the release of heat and access to said lay, said first and second plates having a laminate of a reinforcing material secured between layers of a foamed plastic secured to the inner surfaces thereof.

8. An assembly adapted for use with a shuttle loom to suppress noise caused by contact between a shuttle and the picker comprising first and second plates having a layer of soundproofing material secured to the inner surface thereof, said first plate being adapted to be mounted on the lay of a shuttle loom and said second plate being adapted to be mounted on the loom.

9. The assembly of claim 8 in which said soundproofing material is a foamed polyurethane.

10. The assembly of claim 8 in which said soundproofing material has a reinforcing material secured to the surface thereof adjacent the inner surface of said first and second plates.

11. The assembly of claim 8 in which said soundproofing material is a laminate of a wire backing secured between layers of said soundproofing material.

12. The assembly of claim 11 in which said soundproofing is a closed cell foamed plastic.

13. An assembly adapted for use with a shuttle loom to suppress the noise created by contact between the shuttle and picker of such loom comprising first and second plates having the inner surfaces thereof of a slightly concaved configuration with soundproofing material secured to said concaved surfaces.

14. The assembly of claim 13 in which said soundproofing material is a laminate of a reinforcing material secured between layers of a closed cell foamed polyurethane.

15. The assembly of claim 14 in which said reinforcing material is a wire backing.

16. The assembly of claim 8 in which said first and second plates are of semirigid, heat and shock-resistant plastic.

17. The assembly of claim 16 in which said plastic is polyvinyl chloride.

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