

[54] **SOUND REDUCING UNIT FOR MACHINERY**

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[51] Int. Cl. **G10k 11/00**

[58] Field of Search 181/33 R, 33 A, 33 GA,
181/33 K

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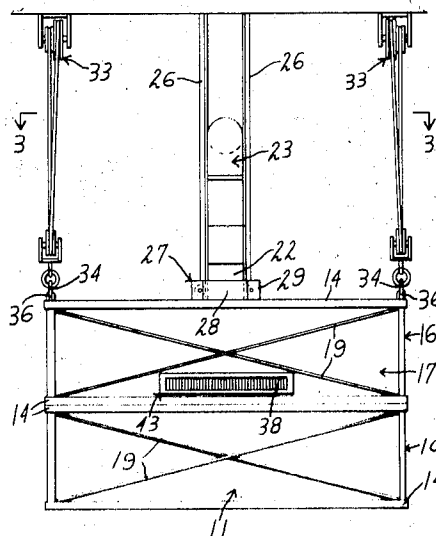
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ABSTRACT

An open top housing formed of sound deadening material surrounds the lower portion of machinery with the upper portion of machinery encased by a movable housing formed of sound deadening material. A depending conduit extends through top of the movable housing with cooperating guide means between said top and the depending conduit limiting lateral movement between said top and the conduit. Movable housing is moved selectively along the conduit to an upper position spaced from the stationary housing to a lower position in cooperation with the stationary housing.

11 Claims, 9 Drawing Figures



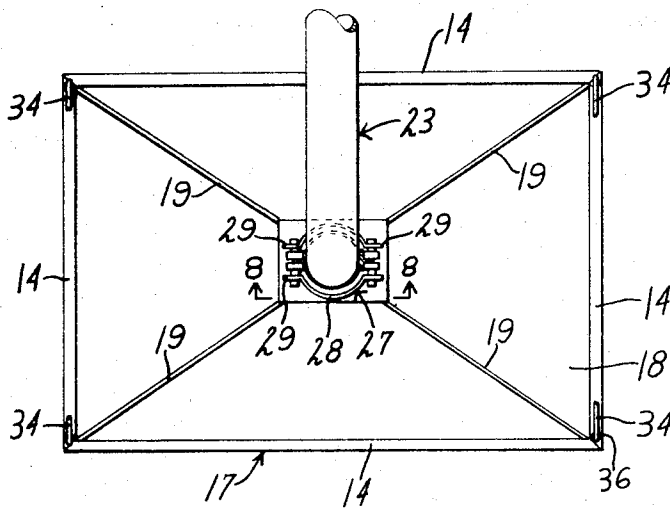


FIG 3

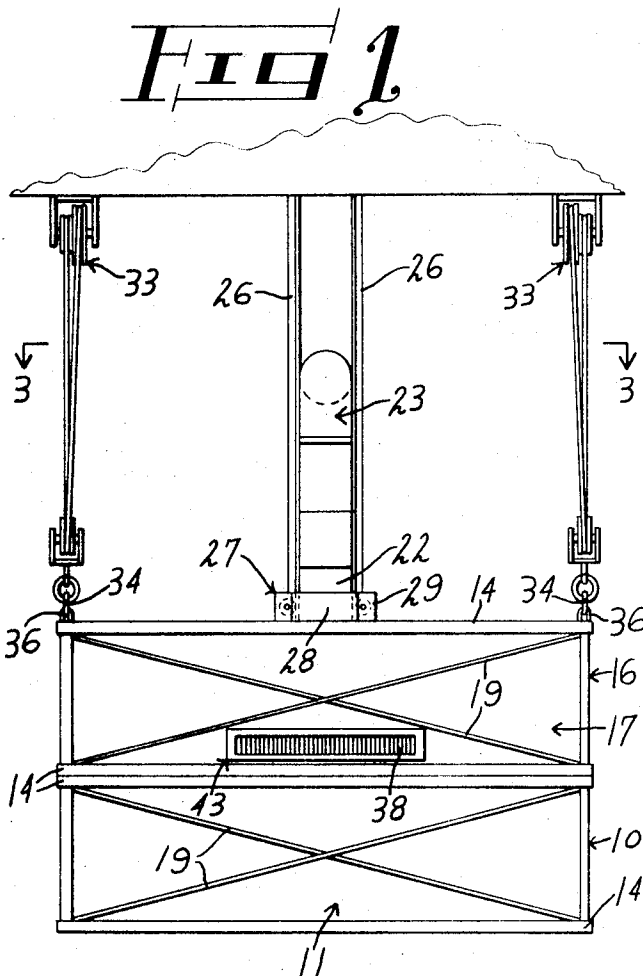


FIG 1

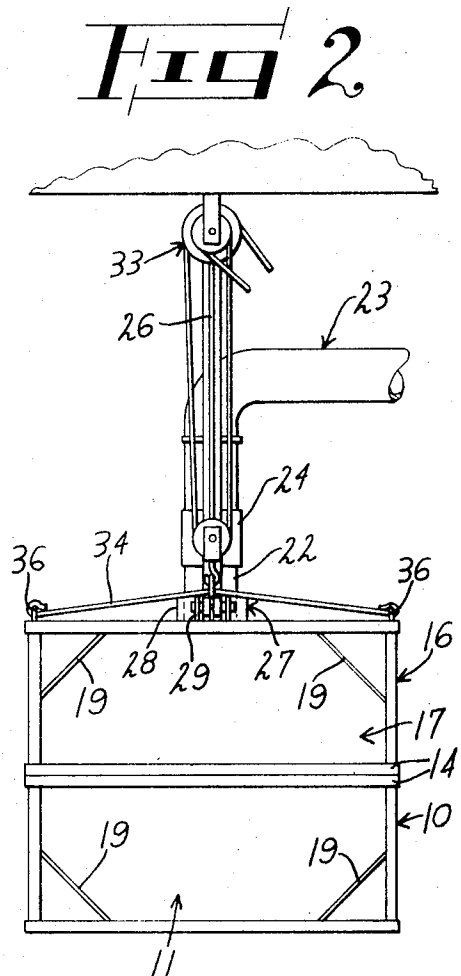


FIG 2

Fig 7

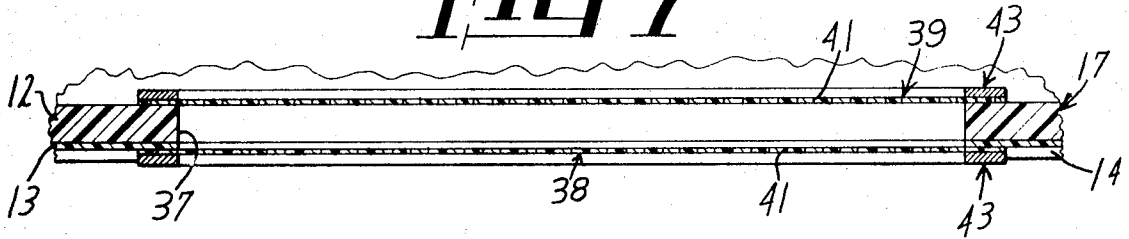
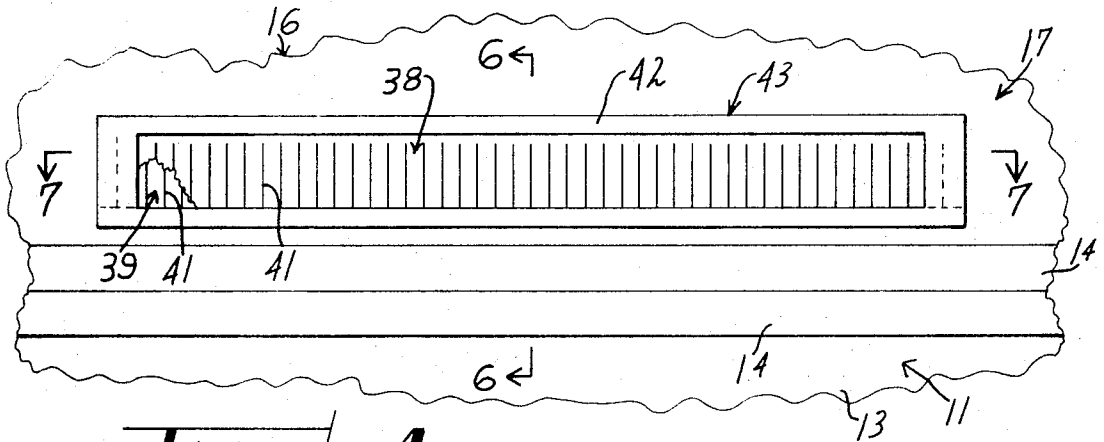


Fig 4

Fig 5

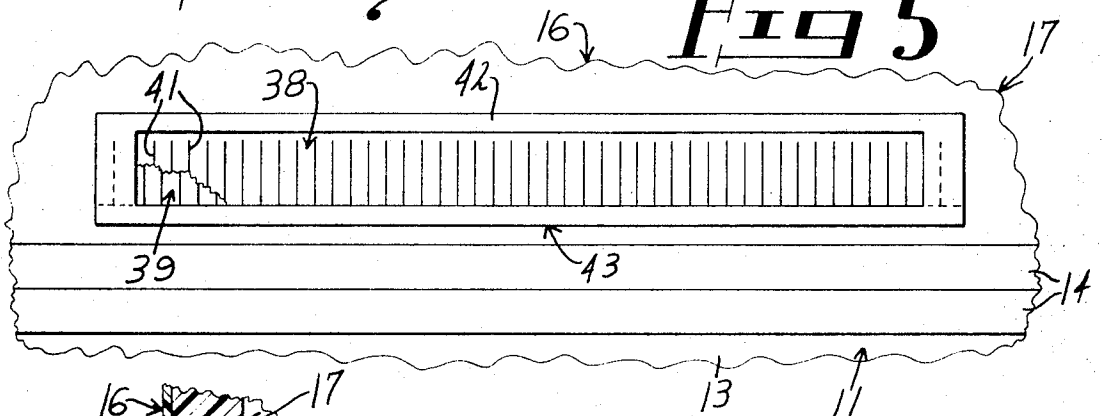
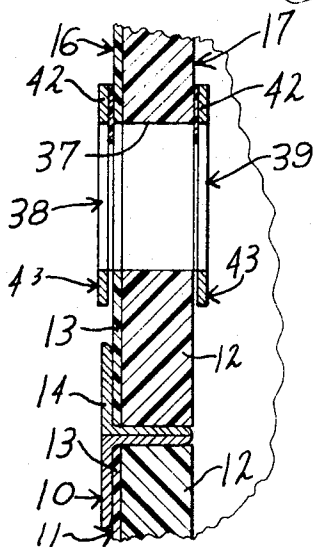


Fig 6

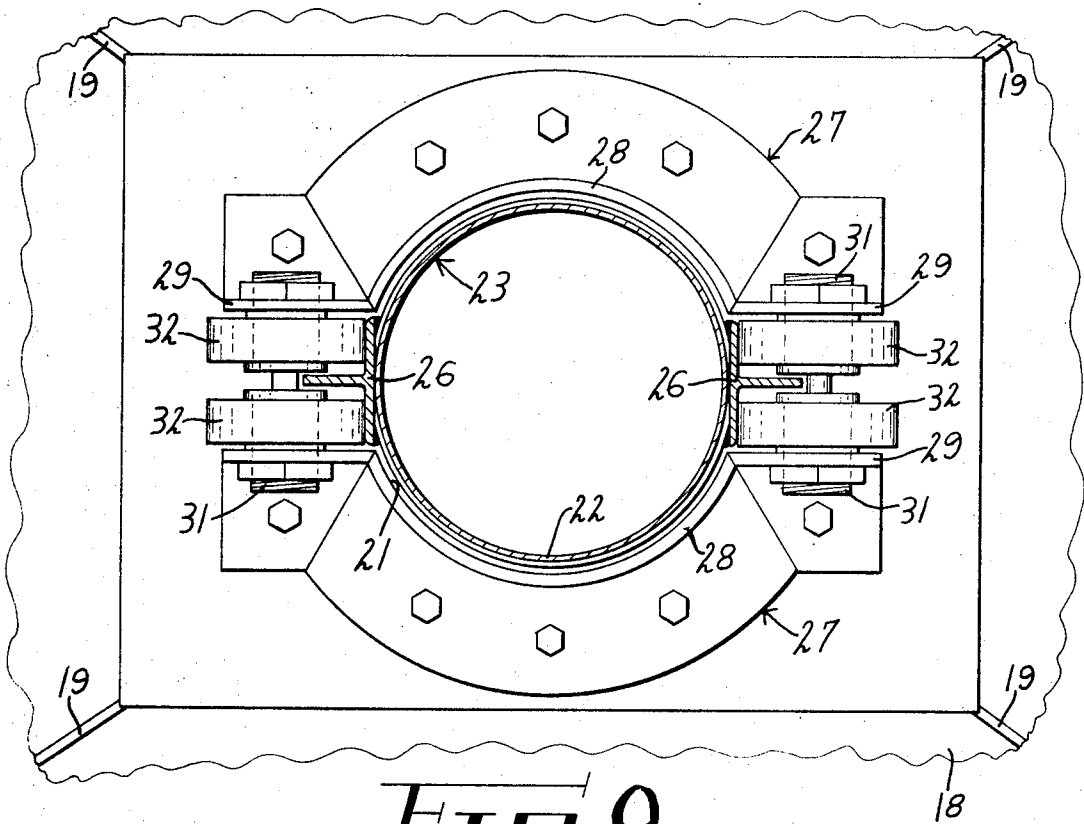
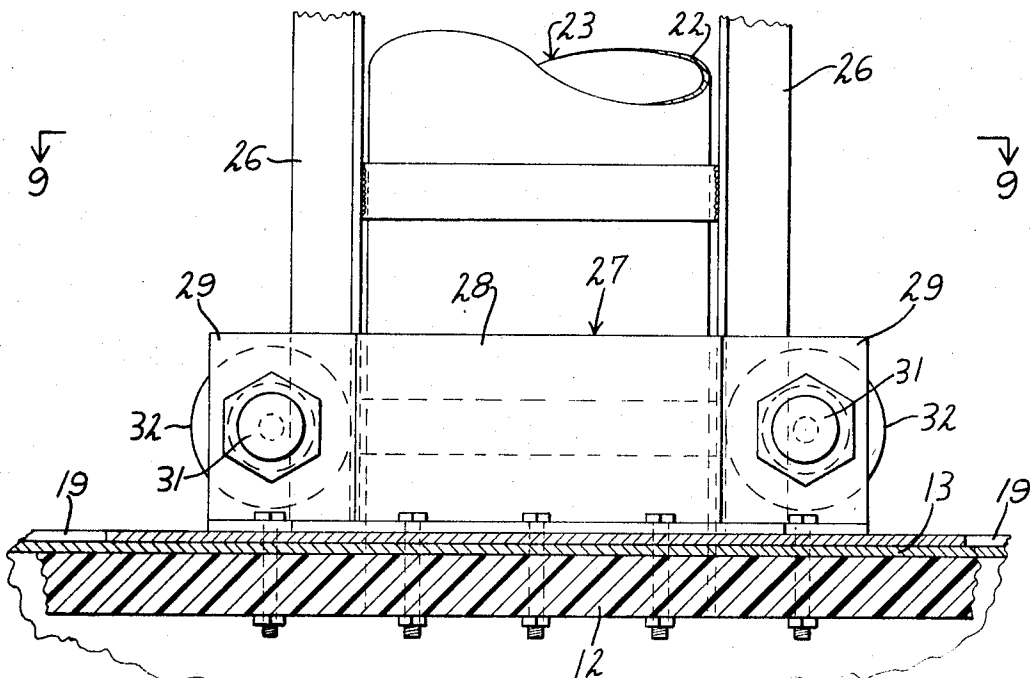


FIG 8



SOUND REDUCING UNIT FOR MACHINERY

BACKGROUND OF THE INVENTION

This invention relates to a sound reducing unit for sound emitting machinery and is particularly adapted for use with machinery which processes raw materials, such as lumber and the like.

As is well known in the art to which my invention relates, the reduction of noise in plants which employ power driven machinery is a very difficult problem. This is especially true in view of the fact that it is impractical to build a separate compartment for each piece of machinery and then provide means for conveying materials to be processed to the machinery. That is, a permanent enclosure for the machinery would not only require a complicated structure but the structure would consume a considerable amount of floor space and at the same time it would be difficult for maintenance workers to gain access to the machinery for repairs and the like.

BRIEF SUMMARY OF THE INVENTION

In accordance with my invention, I encase the machinery by a movable housing formed of a sound deadening material. A depending conduit housing and through the top of the movable housing and cooperating guide means is provided between the movable housing and the depending conduit limiting lateral movement of the movable housing relative to the conduit. Means is provided for moving the movable housing selectively along the conduit to an upper position spaced from a stationary housing or a supporting structure to provide access to the machinery and to a lower position in cooperation with the stationary housing or a supporting structure to provide a sound deadening unit. The depending conduit thus serves a dual purpose of providing guide means for the movable housing and at the same time providing means for removing dust and other pollutants.

Apparatus embodying features of my invention is illustrated in the accompanying drawings, forming a part of this application, in which:

FIG. 1 is a side elevational view showing the apparatus in use for reducing sound;

FIG. 2 is an end elevational view thereof;

FIG. 3 is a view taken generally along the line 3—3 of FIG. 1, parts of the lifting mechanism being omitted for the sake of clarity;

FIG. 4 is an enlarged, fragmental view showing the closure member at one side of the passageway for introducing materials into the housing, partly broken away;

FIG. 5 is a fragmental view showing the closure member at the opposite side of the passageway for introducing materials into the housing from that shown in FIG. 4;

FIG. 6 is an enlarged, sectional view taken generally along the line 6—6 of FIG. 4;

FIG. 7 is a sectional view taken generally along the line 7—7 of FIG. 4;

FIG. 8 is an enlarged, fragmental, sectional view taken generally along the line 8—8 of FIG. 3; and,

FIG. 9 is a sectional view taken generally along the line 9—9 of FIG. 8.

Referring now to the drawings for a better understanding of my invention, I show an open top stationary housing 10 having upstanding side walls 11 disposed to surround the lower portion of sound emitting machin-

ery, not shown. As shown in FIG. 6, the side walls 11 are formed of a sound deadening material 12, such as fiberglass or the like. The outer surface of the sound deadening material is covered by a protective sheet of material 13, such as pressed, fire resistant, composition board sold under the trademark "MASONITE." The edges of the laminated members 12 and 13 are secured to metal angle members 14 formed of a light material, such as aluminum. The metal angle members 14 may be formed of other metals, if desired, such as steel.

Mounted in position to engage the upper edges of the stationary housing 10 is an open bottom, movable housing 16 having depending side walls 17. As shown in FIG. 6, the side walls 17 are formed of a sound deadening material, such as fiberglass 12 which is covered by a protective sheet 13, as described above. The upper edges of the side walls 17 are secured to a top wall 18 which is also formed of the sound deadening material, such as the fiberglass panel 12 and the protective sheet of material 13. Also, the edges of the panels 12 and 13 forming the side walls 17 and the top wall 18 are protected by the metal angle members 14 formed of a light material, such as aluminum. The side walls 11 and 17 and the top wall 18 may be reinforced by suitable means, such as reinforcing rods 19, which extend diagonally of the side walls and the top wall, as shown.

As shown in FIG. 9, the top wall 18 is provided with a centrally disposed passageway 21 therethrough for receiving the depending end 22 of a conduit 23 for discharging dust, and the like, produced by the machinery. The conduit 23 is supported in a stationary position by suitable means and an exhaust fan may be associated therewith for discharging the materials passing into the conduit 23. To reduce the sound transmitted by the conduit 23, a transverse section of the conduit 23, indicated at 24, is formed of a sound deadening material, as shown in FIG. 2.

Secured rigidly to opposite sides of the depending portion 22 of the conduit 23 are vertically extending guide rails 26. While I have shown the guide rails 26 as being generally T-shaped, as viewed in cross section, it would be apparent that the guide rails 26 could be in the form of channel-like members or the like. Mounted on top of the movable housing 16 are arcuate brackets 27 which are mounted adjacent the opening 21 and surround the depending portion 22 of conduit 23, as shown in FIG. 9. Each bracket 27 is provided with an upstanding portion 28 which terminates in end portions 29. As shown in FIG. 9, adjacent end portions 29 extend parallel to each other and are spaced from each other. Mounted for rotation between the adjacent pairs of end portions 29 on suitable shafts 31 are rollers 32 which are adapted to engage the guide rails 26 at opposite sides of the central portion of each guide rail, as clearly shown. Accordingly, the rollers 32 roll along the guide rails 26 as the movable housing 16 is raised and lowered. To move the housing 16 to an upper position in spaced relation to the stationary housing, suitable lift units 33 are connected to the intermediate portions of flexible lift members 34 which in turn are connected to eye members 36 mounted on the angle members 14 surrounding the top wall 18, as shown in FIGS. 1, 2 and 3. In view of the fact that the lift units 33 are conventional type units, such as block and tackle units, no further description thereof is deemed necessary.

Oppositely disposed passageways 37 are provided through opposite sides 17 of the movable housing 16

for passing materials to be processed by the machinery confined therein. That is, the passageways 37 are each of a size to introduce and discharge materials being processed by the machinery, such as wood where the machinery is wood working machinery. Secured to the side wall 17 adjacent the upper edges of the passageways 37 are movable closure members 38 and 39 which are adapted to close the passageways 37 while materials are not passing therethrough. By providing the movable closure members 38 and 39 at opposite sides of the opening 37, an air space is defined therebetween to further reduce the noise emitted. Each movable closure member 38 and 39 is formed of a flexible material and is provided with vertical slits 41 therein with the slits 41 at opposite ends of the passageway 37 being out of alignment with each other, as shown in FIG. 4. The upper edges of the flexible closure members 38 and 39 are secured in place by an upper horizontal member 42 which defines one side of a rectangular grill 43 which surrounds the opening 37 at opposite sides of the side wall 17, as clearly shown in FIG. 6.

From the foregoing description, the operation of the sound reducing unit will be readily understood. The stationary housing 10 is mounted permanently whereby it surrounds the machinery. When the machinery is to be operated, the movable housing 16 is moved to its lower position into engagement with the upper edge of the stationary housing 10 by means of the lift mechanism 33. As the movable housing is lowered, the rollers 32 ride along the guide rails 26, thus limiting lateral movement of the movable housing 16 relative to the stationary conduit 23. With the housing 16 in its lowermost position, the dust, wood chips and other materials produced by or discharged from the machinery is exhausted through the conduit 23. By forming the housings 10 and 16 and the transverse section 24 of the conduit 23 of a sound deadening material, the sound produced by the machinery is greatly reduced. Also, by providing self closing closure members 38 and 39 at opposite sides of the openings 37 for passing the materials to and from the machinery, I further reduce the sound emitted from the apparatus. Vertical movement of the movable housing 16 along the guide rails 26 permits the housing to be moved selectively to an upper position in spaced relation to the stationary housing 10, to thus provide access to the machinery, and to a lower position in cooperation with the upper portion of the side walls of the lower housing to provide a sound proof unit.

From the foregoing, it will be seen that I have devised an improved sound reducing means for machinery. By providing sound reducing apparatus which also permits ready access to the machinery for repair, lubrication or the like, I greatly reduce the time required for such maintenance. Also, by providing a movable portion for the housing, together with a stationary housing unit which is positioned closely adjacent the machinery, I greatly reduce the floor space required for the sound reducing unit. Furthermore, by constructing the movable housing of light, sound deadening material, the movable housing may be readily raised and lowered with a minimum of effort.

While I have shown my invention in but one form, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various other changes and modifications without departing from the spirit thereof.

What I claim is:

1. A sound reducing unit for sound emitting machinery comprising:

- a. an open bottom, movable housing formed of a sound deadening material and having a top wall connected to depending side walls disposed to cooperate with a supporting structure to encase said machinery,
- b. there being an opening through said top wall,
- c. a conduit having a depending portion extending downwardly through said opening in said top wall,
- d. cooperating guide means between said top wall and the depending portion of said conduit limiting lateral movement of said top wall relative to said conduit so that said movable housing is movable selectively to an upper position in spaced relation to said supporting structure providing access to said machinery and to a lower position in cooperation with said supporting structure, and
- e. means to raise and lower said movable housing

2. A sound reducing unit for machinery as defined in claim 1 in which said supporting structure is a stationary housing formed of a sound deadening material disposed to encase the lower portion of said machinery.

3. A sound reducing unit for machinery as defined in claim 1 in which a major portion of the walls of said movable housing are formed of light, sound deadening material.

4. A sound reducing unit for machinery as defined in claim 1 in which the major portion of the walls of said movable housing are formed of fiberglass.

5. A sound reducing unit for machinery as defined in claim 1 in which the outer surface of said sound deadening material is covered by a protective sheet of material.

6. A sound reducing unit for machinery as defined in claim 1 in which reinforcing members extend diagonally alongside surfaces of said movable housing to add strength and rigidity thereto.

7. A sound reducing unit as defined in claim 1 in which said cooperating guide means between said top wall and the depending portion of said conduit comprises:

- a. vertical guide rails carried by opposite sides of said depending portion, and
- b. rollers carried by said top wall at opposite sides of said depending portion and engaging said guide rails.

8. A sound reducing unit as defined in claim 1 in which a transverse section of said depending portion of said conduit is formed of a sound deadening material.

9. A sound reducing unit as defined in claim 1 in which oppositely disposed passageways are provided through opposite sides of said side walls of said movable housing for passing materials to be processed by said machinery and movable closure members extend across said passageways to close said passageways while materials are not passing through said passageways.

10. A sound reducing unit as defined in claim 9 in which a movable closure member is mounted at opposite ends of each said passageway through said side walls to define an air space therebetween.

11. A sound reducing unit as defined in claim 10 in which each movable closure member is a flexible member supported along its upper edge adjacent the upper edge of the adjacent passageway and vertical slits are provided in the lower portion of each closure member with said vertical slits of the closure members at opposite ends of said passageway being out of alignment with each other.

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