CLAIMS

1. A translucent sound-absorbing panel, comprising:

a front perforated plate to face a sound source, which comprises a material having translucency and transparency and has a large number of through-holes;

a back sound insulating plate which is placed behind the front perforated plate with respect to the sound source and comprises a material having translucency and transparency; and

an internal perforated plate which is placed between the front perforated plate and the back perforated plate so as to separate a space between the front perforated plate and the back perforated plate into a plurality of spaces, comprises a material having translucency and transparency and has a large number of through-holes,

wherein a plate thickness of the internal perforated plate is 0.2 mm or more and 1.5 mm or less.

2. The translucent sound-absorbing panel according to claim 1, wherein assuming that an aperture ratio of the internal perforated plate is α, the plate thickness of the internal perforated plate is t, a hole diameter of the through-hole of the internal perforated plate is d, a density of a plate part of the internal perforated plate is ρ and air density is ρ_0, an area density ratio η which is a value obtained by dividing an area density of the plate part of the internal perforated plate by an area density of air of a part of the through-hole of the internal perforated plate and is represented by the following formula is 1.0 or more.

$$\eta=\rho\cdot t\cdot(1-\alpha)/(\rho_0\cdot(t+0.8\cdot d)/\alpha) \qquad (1)$$

3. The translucent sound-absorbing panel according to claim 1, wherein a material of the internal perforated plate is a resin.

4. The translucent sound-absorbing panel according to claim 1, wherein a plurality of the internal perforated plates are provided and the internal perforated plates are isolated to each other.

5. The translucent sound-absorbing panel according to claim 1, further comprising a partition plate which is provided in each of the plurality of spaces and comprises a material having translucency and transparency,

wherein the internal perforated plate is sandwiched by two or more of the partition plates.

6. The translucent sound-absorbing panel according to claim 5, wherein a plurality of the partition plates are lined up in a straight line toward the back sound insulating plate from the front perforated plate while sandwiching the internal perforated plate .

7. The translucent sound-absorbing panel according to claim 1, wherein a plate thickness of the front perforated plate is 2 mm or more and 3 mm or less.

8. The translucent sound-absorbing panel according to claim 1, wherein a material of the front perforated plate is a resin.

9. The translucent sound-absorbing panel according to claim 1, wherein a plate thickness of the sound insulting plate is 5 mm or more and 16 mm or less.

10. The translucent sound-absorbing panel according to claim 1, wherein a material of the back sound insulting plate is a resin.

11. The translucent sound-absorbing panel according to claim 1, wherein a large number of the through-holes are densely provided on a partial region of the front perforated plate.

CLAIMS

1. A translucent sound-absorbing panel, comprising:

a front perforated plate to face a sound source, which comprises a material having translucency and transparency and has a large number of through-holes;

a back sound insulating plate which is placed behind the front perforated plate with respect to the sound source and comprises a material having translucency and transparency; and

an internal perforated plate which is placed between the front perforated plate and the back perforated plate so as to separate a space between the front perforated plate and the back perforated plate into a plurality of spaces, comprises a resin material having translucency and transparency and has a large number of through-holes,

wherein assuming that an aperture ratio is α, a plate thickness is t, a hole diameter of the through-hole is d, a density of a plate part is ρ and air density is ρ_0, the internal perforated plate has an area density ratio η which is a value obtained by dividing an area density of the plate part by an area density of air of a part of the through-hole and is represented by the following formula is 1.0 or more:

$$\eta=\rho\cdot t\cdot(1-\alpha)/(\rho_0\cdot(t+0.8\cdot d)/\alpha) \quad (1),$$

and the plate thickness t is 0.2 mm or more and 1.5 mm or less and the aperture ratio α is 0.5% or less.

2. The translucent sound-absorbing panel according to claim 1, further comprising a front-side internal perforated plate, wherein the front-side internal perforated plate is provided between the front perforated plate and the back sound insulating plate and is provided nearer the side of the front perforated plate rather than the side of the internal perforated plate, and has the area density ratio η of 1.0 or more, the plate thickness t of 0.2 mm or more and 1.5 mm or less and the aperture ratio α of 1% or less, the aperture ratio α of the front-side internal perforated plate being larger than the aperture ratio α of the internal perforated plate.

3. The translucent sound-absorbing panel according to claim 1 or 2, further comprising a partition plate which is provided in each of the plurality of spaces and comprises a material having translucency and transparency,

wherein the internal perforated plate is sandwiched by two or more of the partition plates.

4. The translucent sound-absorbing panel according to claim 3, wherein a plurality of the partition plates are lined up in a straight line toward the back sound insulating plate from the front perforated plate while sandwiching the internal perforated plate .

5. The translucent sound-absorbing panel according to any one of claims 1 to 4, wherein a plate thickness of the front perforated plate is 2 mm or more and 3 mm or less.

6. The translucent sound-absorbing panel according to any one of claims 1 to 5, wherein a material of the front perforated plate is a resin.

7. The translucent sound-absorbing panel according to any one of claims 1 to 6, wherein a plate thickness of the sound insulting plate is 5 mm or more and 16 mm or less.

8. The translucent sound-absorbing panel according to any one of claims 1 to 7, wherein a material of the back sound insulting plate is a resin.

9. The translucent sound-absorbing panel according to any one of claims 1 to 8, wherein a large number of the through-holes are densely provided on a partial region of the front perforated plate.