Claims

1. An ultrasonic flaw detection device (100) and an object to be inspected (50),
the object to be inspected (50) comprising:

a lower partition (60) made of a metal and including a base plate (62) and ribs (64), the ribs (64) being members that are erected from the base plate (62) and extend in a first direction, and

an upper partition (60) or cover portion (54) stacked on top of the lower partition (60), the upper partition (60) being made of a metal and including a base plate (62) and ribs (64), the ribs (64) being members that are erected from the base plate (62) and extend in the first direction, and

wherein upper surfaces of the ribs (64) of the lower partition (60) and a bottom surface (62a) of the upper partition (60) or cover portion (54) are bonded to each other, so that channels (52) are formed by groove portions (66) formed between the ribs (64) of the lower partition (60) and the bottom surface (62a) of the upper partition (60) or cover portion (54),

wherein an inspection surface (S) of the object to be inspected (50) is a joint surface (S) between the rib (64) of the lower partition (60) which is between the channels (52) and the bottom surface (62) of the upper partition (60) or cover portion (54),
the ultrasonic flaw detection device (100) comprising:

a transmission window (118);

a transmission probe (110), which is configured to transmit an ultrasonic beam from the transmission window (118)

toward a range required to be inspected, which is set in advance, of the inspection surface (S) of the object to be inspected (50);

a reception window (128), which is arranged in a relationship with respect to the transmission window (118) in which an ultrasonic wave that has been reflected outside the range required to be inspected is inhibited from reaching the reception window (128); and

a reception probe (120), which is configured to receive an ultrasonic wave that has passed through the reception window (128),

wherein the transmission probe (110) is formed so that an edge of the ultrasonic beam has an angle at which the edge of the ultrasonic beam reaches an edge on the transmission probe side of the range required to be inspected or an inside of the edge on the transmission probe side of the range required to be inspected, and

wherein the transmission window (118)and the reception window (128) have angles with respect to the inspection surface (S) that establish the relationship in which the ultrasonic wave that has been reflected outside the range required to be inspected is inhibited from reaching the reception window (128).

2. An ultrasonic flaw detection device (100) and an object to be inspected (50) according to claim 1,

wherein the transmission probe (110) has a first opposing surface portion (112a) that is opposed to the inspection surface (S), and the transmission window (118) is provided in

a side surface portion (112b) that is erected from the first opposing surface portion (112a), and

wherein the reception probe (120) has a second opposing surface portion (122a) that is opposed to the inspection surface (S), and the reception window (128) is provided in a side surface portion (122b) that is erected from the second opposing surface portion (122a).

3. An ultrasonic flaw detection device (100) and an object to be inspected (50) according to claim 1 or 2, further comprising a medium portion, which is provided between the transmission window (118) and the reception window (128), and through which an ultrasonic wave is to be propagated.

4. An ultrasonic flaw detection device (100) and an object to be inspected (50) according to claim 3, wherein the object to be inspected (50) is at least partially used as the medium portion.

5. An ultrasonic flaw detection device (100) and an object to be inspected (50) according to any one of claims 1 to 4, further comprising a determination module, which is configured to determine presence or absence of a flaw in the range required to be inspected based on the ultrasonic wave received by the reception probe (120).

6. An ultrasonic flaw detection method, in which an ultrasonic flaw detection device (100) is used to detect a flaw in a range required to be inspected, which is set in

advance, of an inspection surface (S) of an object to be inspected (50),

the object to be inspected (50) comprising:

a lower partition (60) made of a metal and including a base plate (62) and ribs (64), the ribs (64) being members that are erected from the base plate (62) and extend in a first direction, and

an upper partition (60) or cover portion (54) stacked on top of the lower partition (60), the upper partition (60) being made of a metal and including a base plate (62) and ribs (64), the ribs (64) being members that are erected from the base plate (62) and extend in the first direction, and

wherein upper surfaces of the ribs (64) of the lower partition (60) and a bottom surface (62a) of the upper partition (60) or cover portion (54) are bonded to each other, so that channels (52) are formed by groove portions (66) formed between the ribs (64) of the lower partition (60) and the bottom surface (62a) of the upper partition (60) or cover portion (54),

wherein an inspection surface (S) of the object to be inspected (50) is a joint surface (S) between the rib (64) of the lower partition (60) which is between the channels (52) and the bottom surface (62) of the upper partition (60) or cover portion (54),

the ultrasonic flaw detection device (100) including a transmission probe (110) configured to transmit an ultrasonic beam from a transmission window (118), and a reception probe (120)configured to receive an ultrasonic wave that has passed through a reception window (128), the ultrasonic flaw

detection method comprising:

arranging the transmission probe (110) and the reception probe (120)so that the transmission window (118)and the reception window (128) have a relationship in which an ultrasonic wave that has been reflected outside the range required to be inspected is inhibited from reaching the reception window (128); and

causing the transmission probe (110) to transmit the ultrasonic beam from the transmission window (118) toward the range required to be inspected,

wherein the transmission probe (110) is formed so that an edge of the ultrasonic beam has an angle at which the edge of the ultrasonic beam reaches an edge on the transmission probe side of the range required to be inspected or an inside of the edge on the transmission probe side of the range required to be inspected, and

wherein the transmission window (118)and the reception window (128) have angles with respect to the inspection surface (S) that establish the relationship in which the ultrasonic wave that has been reflected outside the range required to be inspected is inhibited from reaching the reception window (128).