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(54) **SECURING DEVICE FOR COMBINING FLOOR BOARDS**

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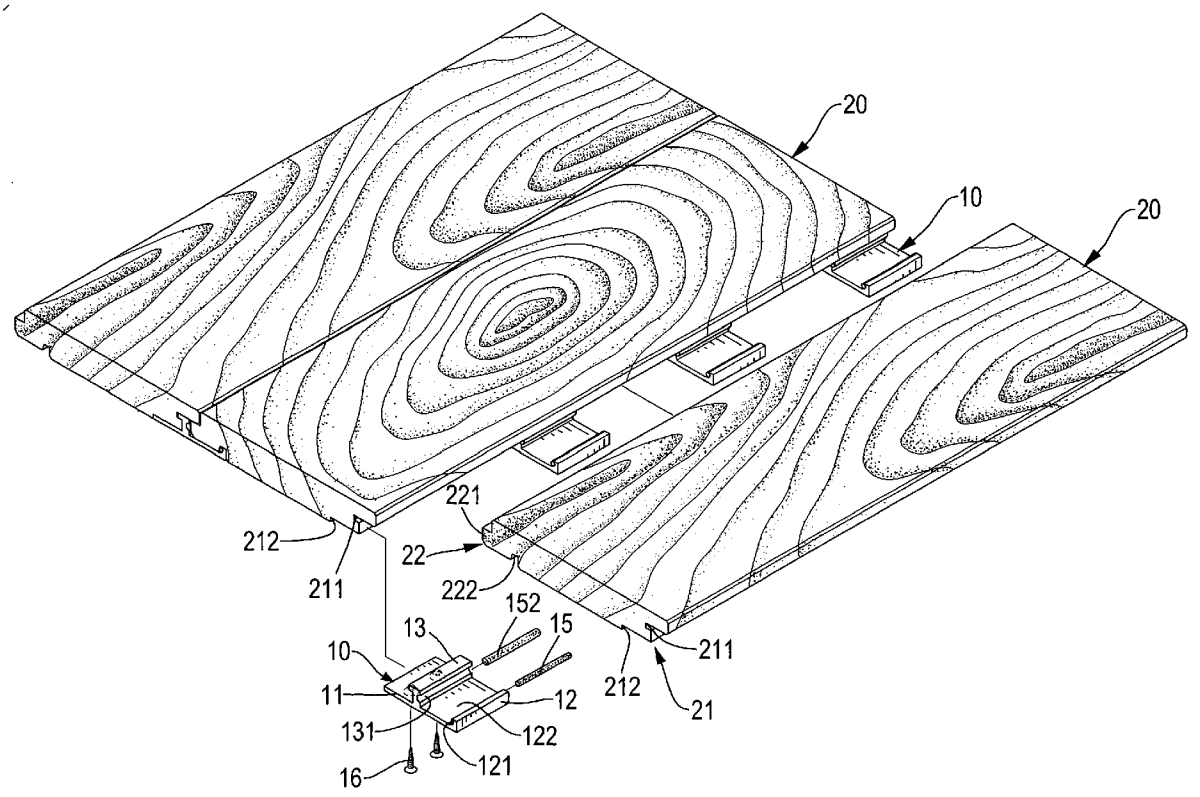
(57) **ABSTRACT**

A securing device has a base with two longitudinal sides, an extended tongue, a rib, two buffers and at least one pin. The extended tongue is formed on one of the longitudinal sides on the top surface and has a first mounting groove defined in the inner surface of the extended tongue. The rib is formed on the top surface of the base to form a receiving recess between the extended tongue and the rib. The rib is aligned with the extended tongue and has a second mounting groove. The at least one hole is defined in the base at the other longitudinal side. The two buffers are respectively mounted in the first mounting groove and the second mounting groove. The buffer mounted in the second mounting groove has a diameter larger than that of the other buffer. The at least one pin is mounted respectively in the at least one hole. With the two buffers, the noise caused from piecing the floor boards will be reduced.



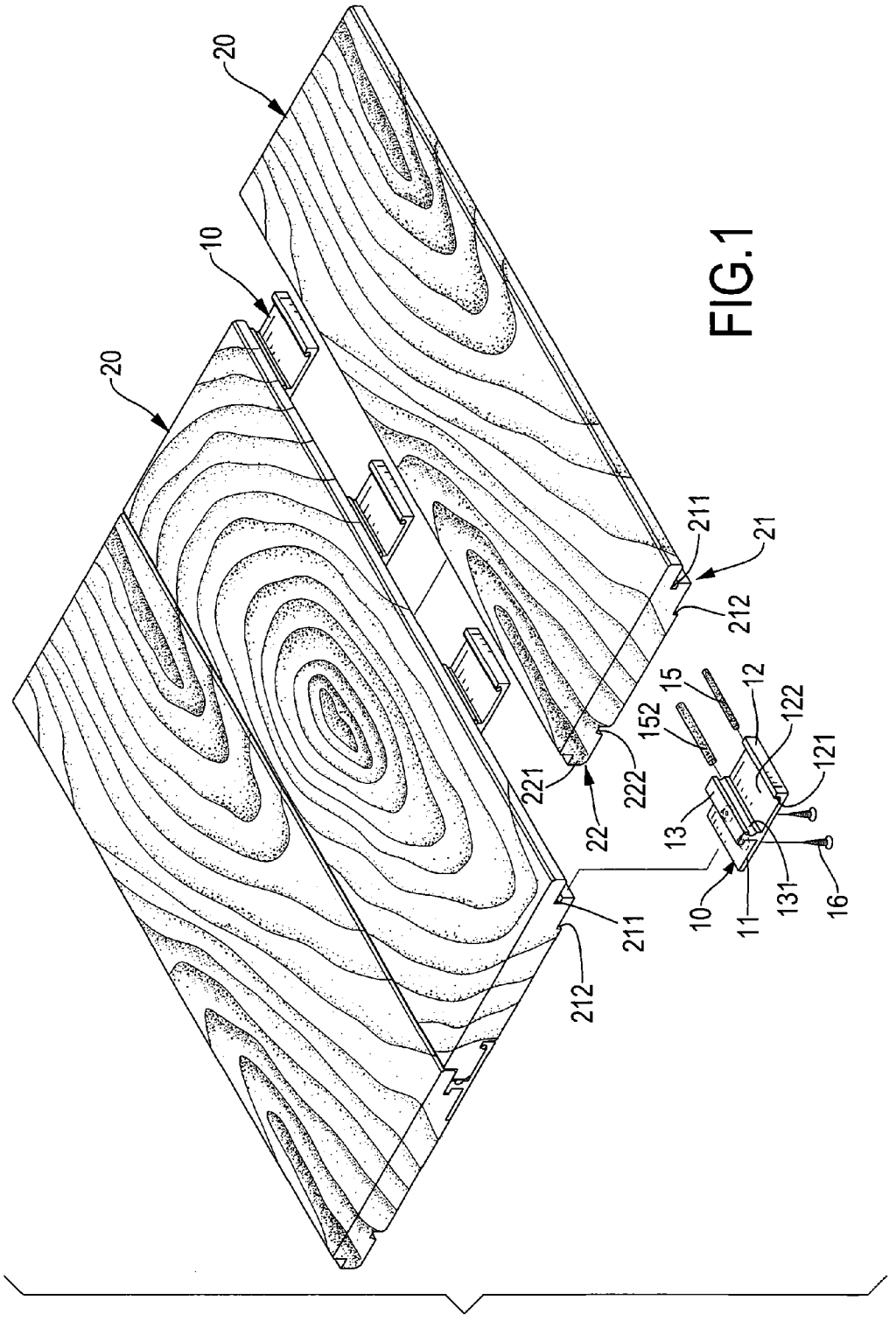

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FIG.1

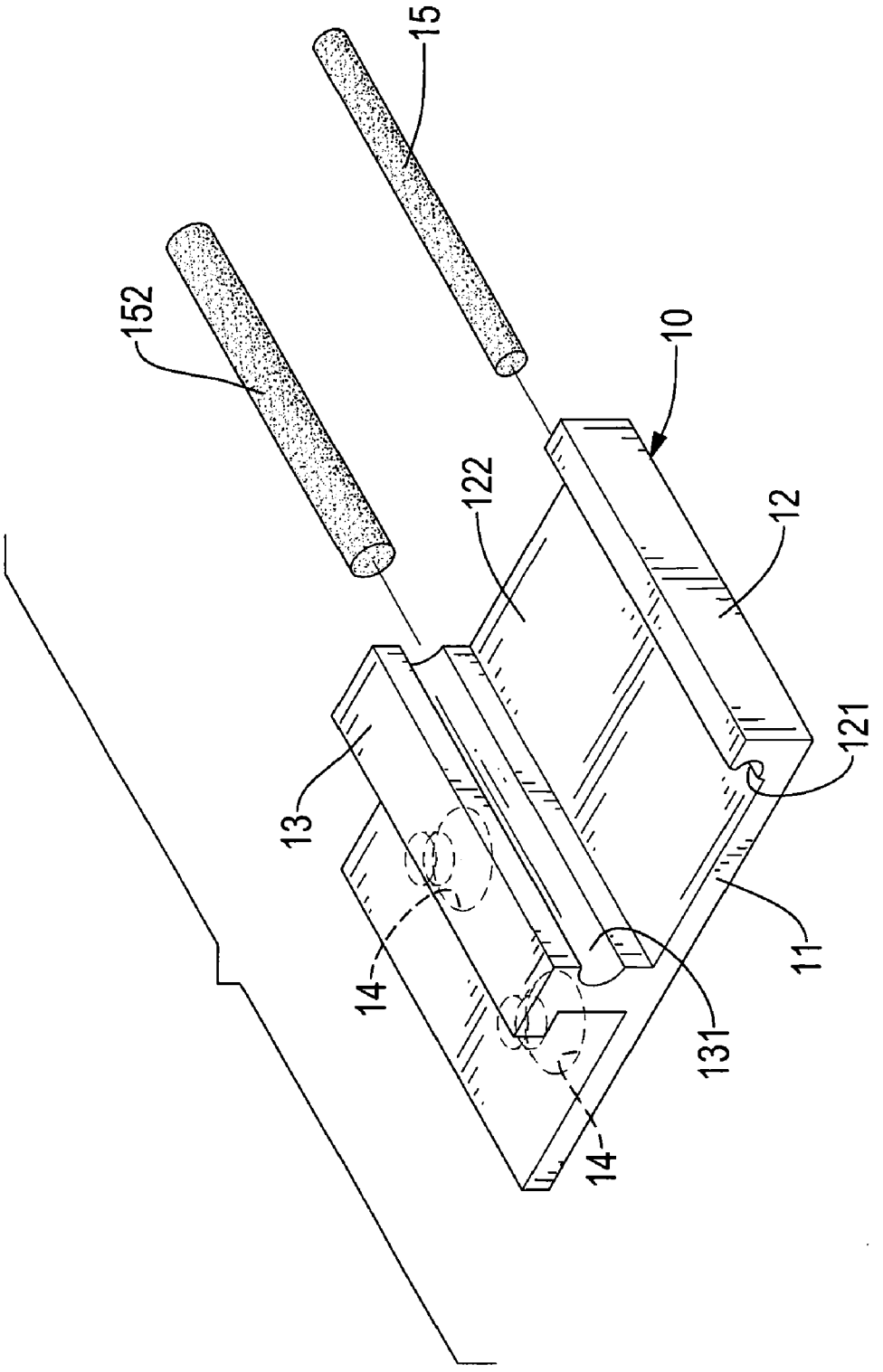

FIG.2

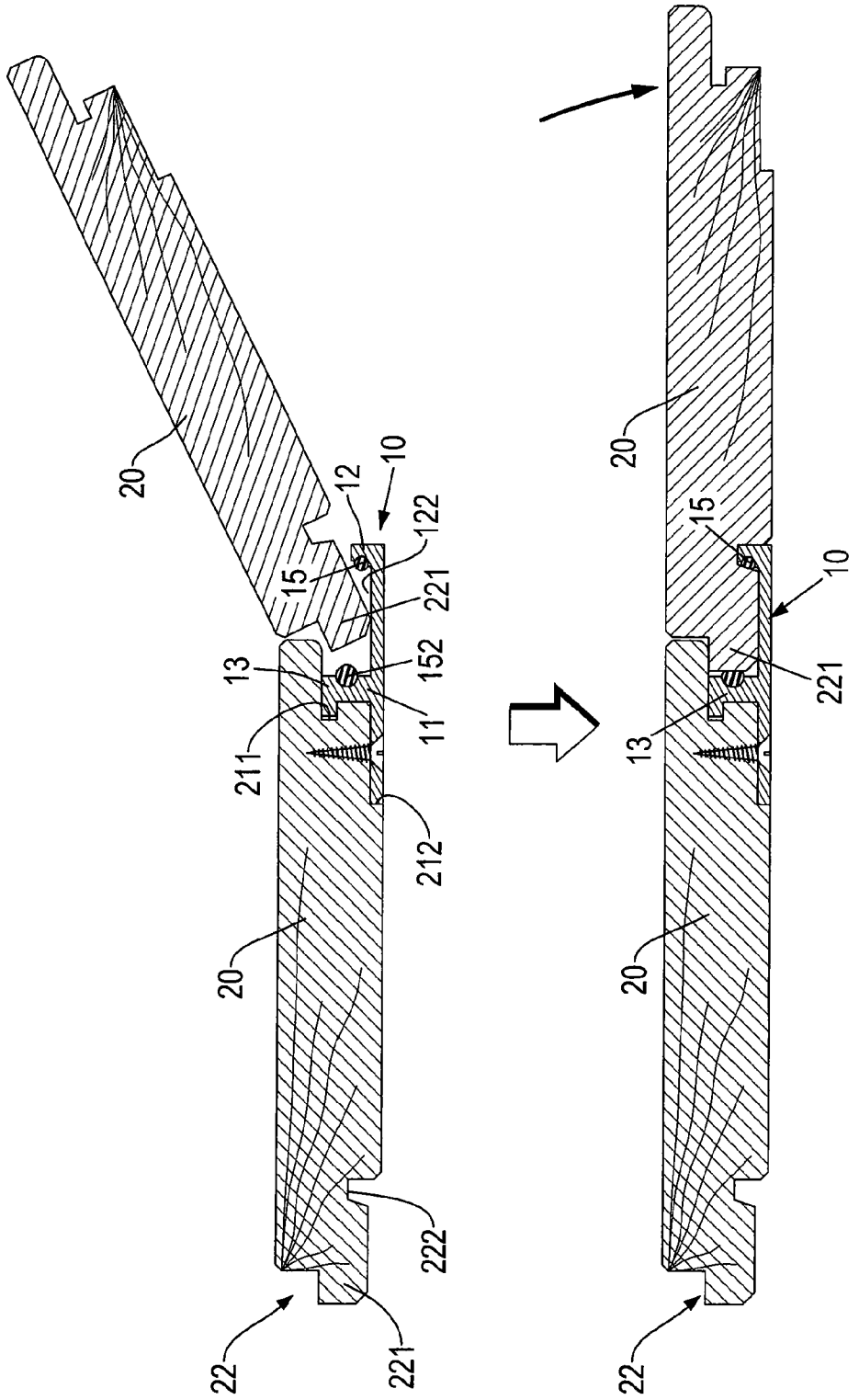
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FIG.3

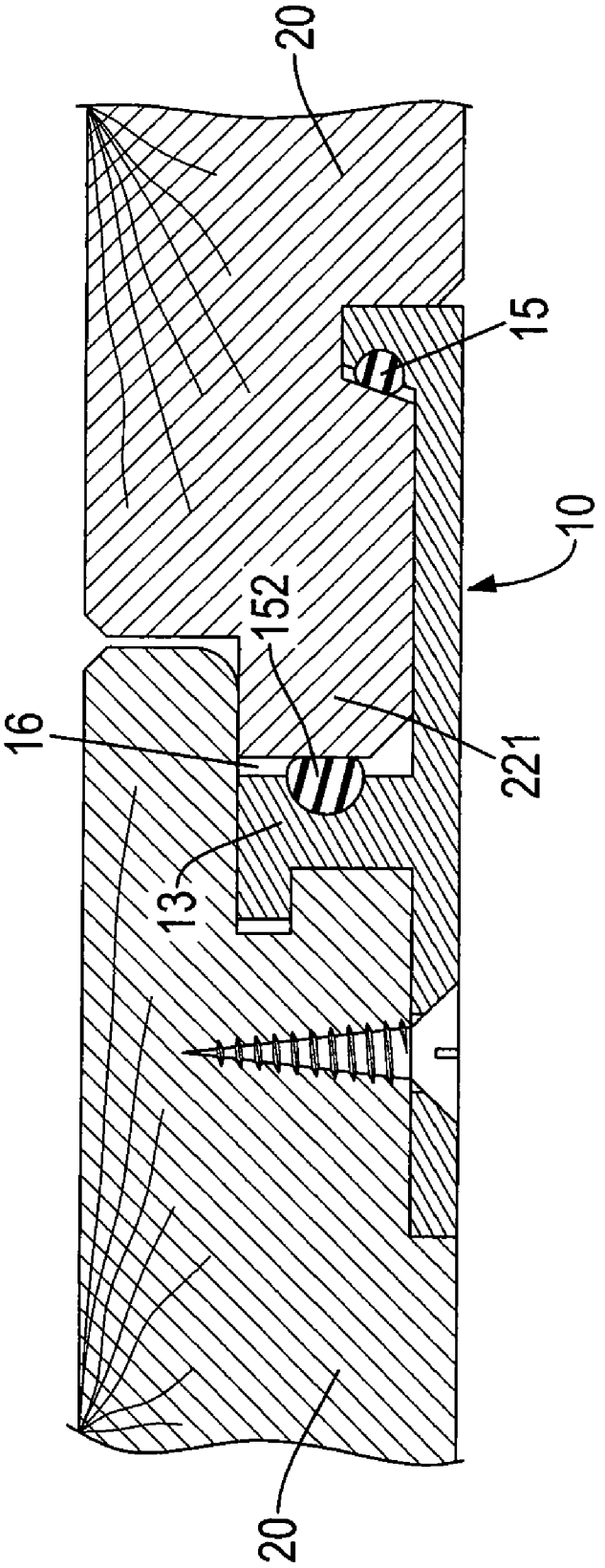

FIG.4

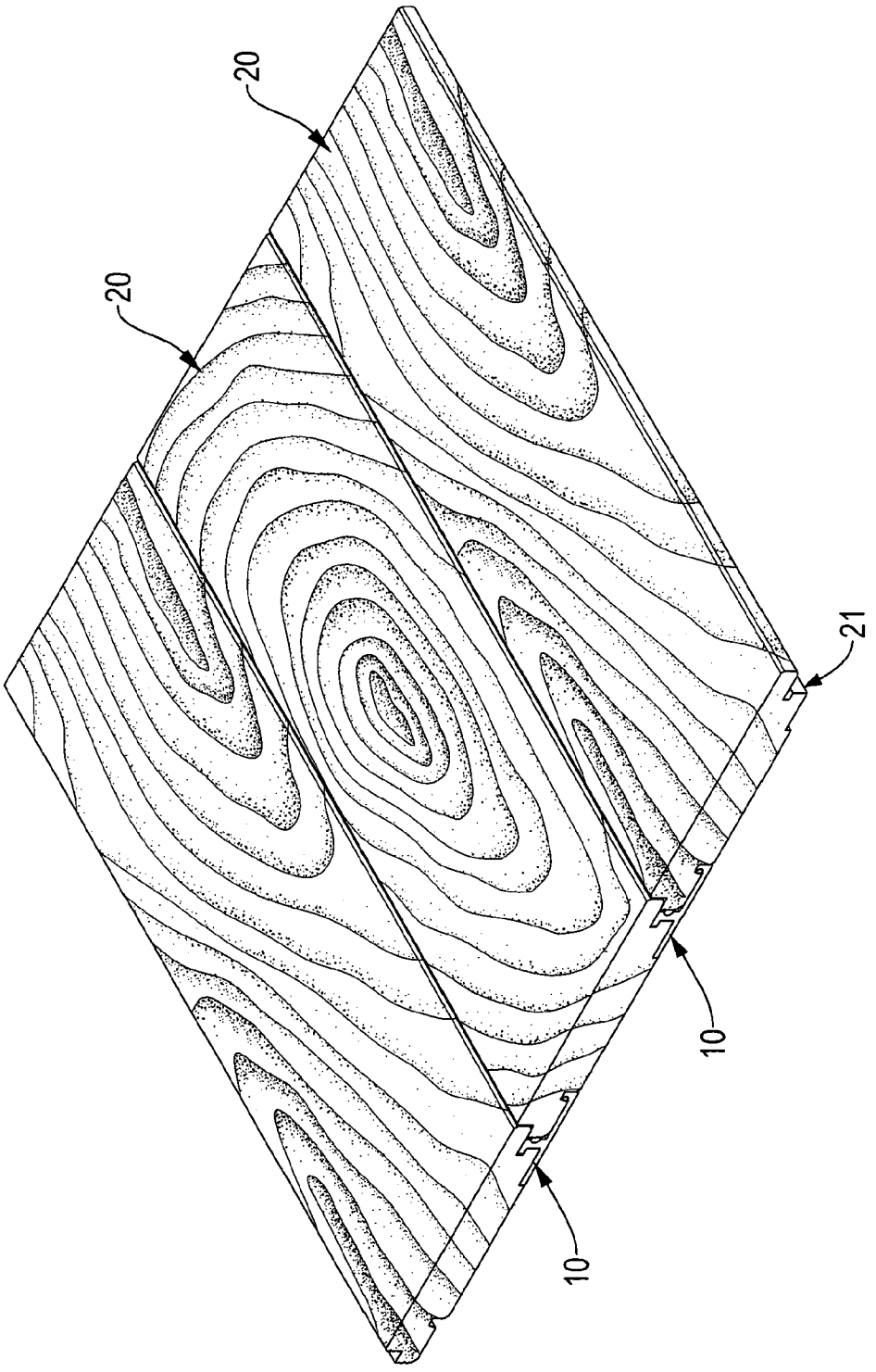

FIG.5

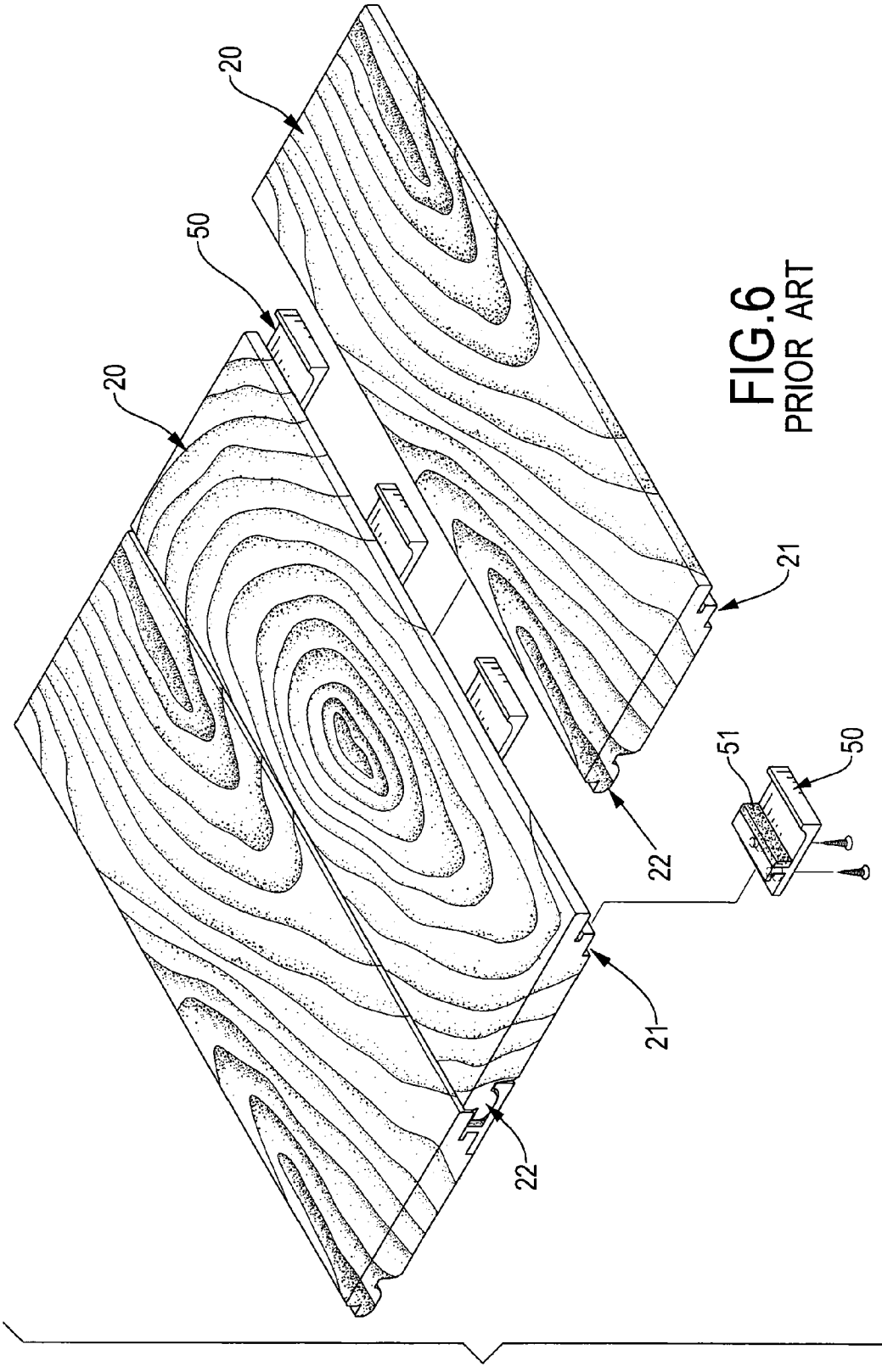

FIG.6
PRIOR ART

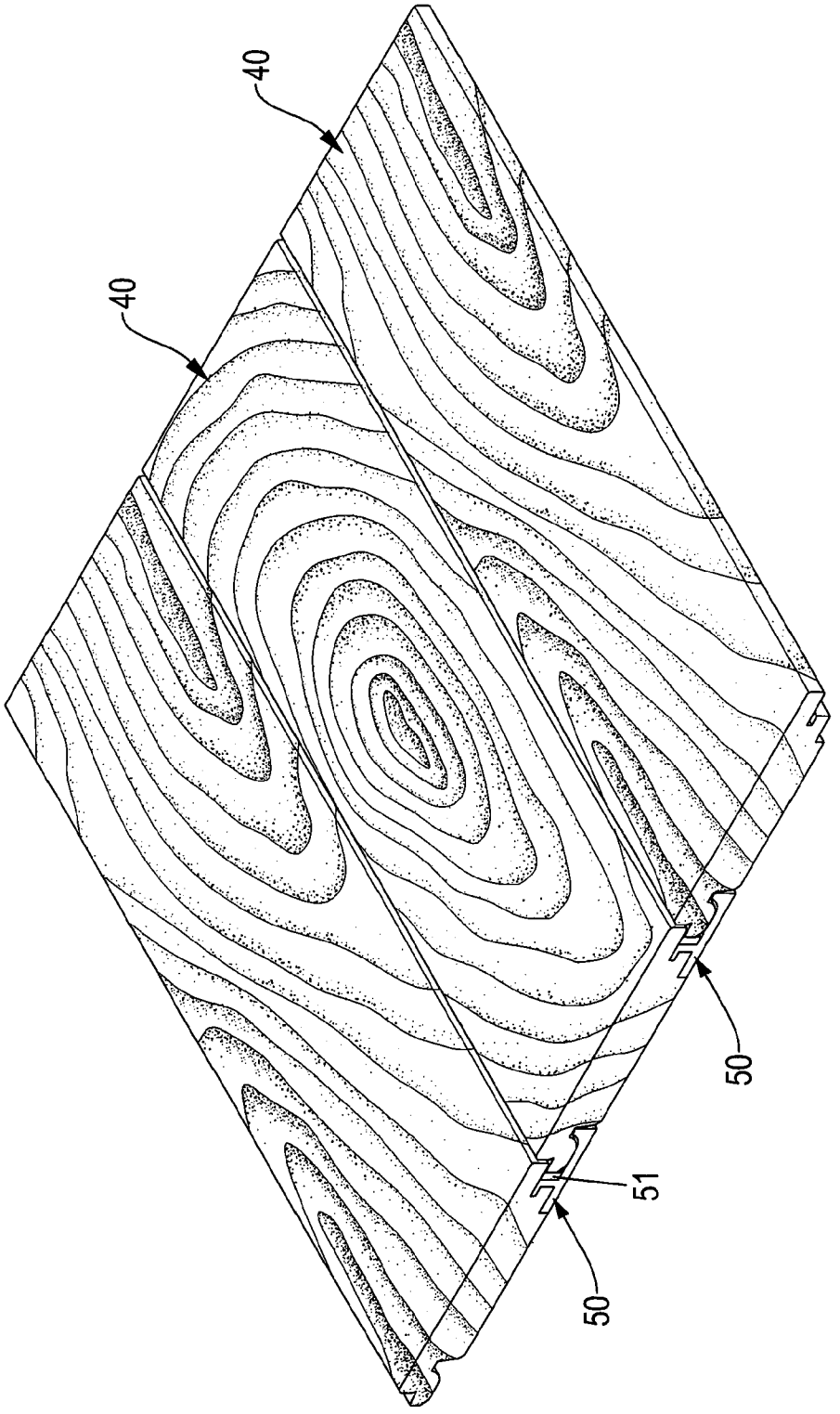

FIG.7
PRIOR ART

SECURING DEVICE FOR COMBINING FLOOR BOARDS

[0001] This application is a continuation-in-part of the application Ser. No. 11/322,301, flied on Jan. 3, 2006.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention relates to a securing device, and more particularly to a securing device for combining two adjacent floor boards conveniently.

[0004] 2. Description of Related Art

[0005] Conventionally, combinable floor boards are pieced together via applying adhesive agent on bottom faces of the floor boards to allow the floor boards to securely attached onto a surface, i.e. ground. Further, securing elements such as nails are applied to enhance the attachment between the floor boards to the ground.

[0006] A kind of conventional floor board (**20**) and a securing device (**50**) are shown in FIGS. **6** and **7**. The floor board (**20**) has two longitudinal sides, a first connection part (**21**) and a second connection part (**22**). The first connection part (**21**) is defined in one of the longitudinal sides of the floor board (**20**) and a second connection part (**22**) is formed on the other longitudinal side of the floor board (**20**) to be opposite and complementary to the first connection part (**21**). The securing device (**50**) is mounted between the adjacent floor boards (**20**).

[0007] The first connection part (**21**) is defined in the side face of the floor board (**20**). The first connection part (**21**) has an upper cutout (**211**) and a lower cutout (**212**) respectively defined in the side face of the floor board (**20**).

[0008] The second connection part (**22**) defined in the side face of the floor board (**20**) opposite the first connection part (**21**). The second connection part (**22**) has a tongue (**221**) extending from the side face and a slit (**222**) defined in the bottom of the floor board (**20**) besides the tongue (**221**).

[0009] The securing device (**50**) mounted between the adjacent floor boards (**20**) has an extended tongue and a rib. The extended tongue is mounted inside the slit (**222**) in the floor board (**20**) and the rib formed on the top surface of the securing device (**50**) for mounting inside the first connection part (**21**) of the floor board (**20**). The securing device (**50**) further comprises a buffer (**51**) mounted on the rib for the adjacent floor boards (**20**) mounting more securely.

[0010] When the connector (**50**) is applied to a bottom side of one of the floor boards (**20**) and the floor board (**20**) with the securing device (**50**) is placed on top of the ground, a different floor board (**20**) is connected to the previous floor board (**20**) with the tongue (**221**) being received in the first connection part (**21**). Therefore, the floor is completed via piecing the floor boards (**20**).

[0011] However, when the conventional securing device (**50**) is assembled to the floor boards (**20**), a loud noise is always made due to the hard material of the floor boards (**20**) and the securing device (**50**). Further, the buffer (**51**) mounted on the rib of the securing device (**50**) is adhered one by one manually and is time consuming.

[0012] To overcome the shortcomings, the present invention tends to provide a securing device to mitigate the aforementioned problems.

SUMMARY OF THE INVENTION

[0013] The primary objective of the present invention is to provide a securing device to securely combine two adjacent floor boards conveniently.

[0014] In order to accomplish the above objective, the securing device of the present invention has a base with two longitudinal sides, an extended tongue, a rib, two buffers and at least one pin. The extended tongue is formed on one of the longitudinal sides on the top surface and has a first mounting groove defined in the inner surface of the extended tongue. The rib is formed on the top surface of the base to form a receiving recess between the extended tongue and the rib. The rib is aligned with the extended tongue and has a second mounting groove. The at least one hole is defined in the base at the other longitudinal side. The two buffers are respectively mounted in the first mounting groove and the second mounting groove. The buffer mounted in the second mounting groove has a diameter larger than that of the buffer mounted in the first mounting groove to define a gap between the side surface of the rib and a tongue of a floor board when the floor board is combined with the securing device. The at least one pin is mounted respectively in the at least one hole. With the two buffers, the noise caused from piecing the floor boards will be reduced.

[0015] Other objects, advantages and novel features of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] FIG. **1** is an exploded perspective view of floor boards and securing devices in accordance with the present invention;

[0017] FIG. **2** is an exploded perspective view of the securing device in FIG. **1**;

[0018] FIG. **3** is an operational side view in partial section of the floor boards and the securing device in FIG. **1** showing combination between two adjacent floor boards with the securing device;

[0019] FIG. **4** is an enlarged side view in partial section of the floor boards and the securing device in FIG. **3**;

[0020] FIG. **5** is a perspective view of the combination between adjacent floor boards in FIG. **1**;

[0021] FIG. **6** is an exploded perspective view of conventional floor boards with securing devices in accordance with the prior art; and

[0022] FIG. **7** is a perspective view of the combination between adjacent floor boards with securing devices in FIG. **6**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0023] With reference to FIGS. **1** to **3**, a floor board (**20**) includes a first connection part (**21**) formed on a first side face of the floor board (**20**) and a second connection part (**22**) formed on a second side face of the floor board (**20**) opposite to the first connection part (**21**). The floor board (**20**) may have a structure same as that of a conventional one.

[0024] A securing device (**10**) in accordance with the present invention is mounted between adjacent floor boards (**20**) and has a base (**11**), an extended tongue (**12**), a rib (**13**), a receiving recess (**122**), at least one hole (**14**), two buffers (**15**,**152**) and at least one pin (**16**).

[0025] The base (**11**) has two longitudinal sides and a top surface.

[0026] The extended tongue (**12**) is formed on one of the longitudinal sides on the top surface of the base (**11**) and has an inner surface and a first mounting groove (**121**). The mounting groove (**121**) is defined in the inner surface of the extended tongue (**12**). In a preferred embodiment, the cross-section of the mounting groove (**121**) is semi-circular.

[0027] The rib (**13**) is formed on the top surface of the base (**11**) away the center of the base (**11**) to form a receiving recess (**122**) between the extended tongue (**12**) and the rib (**13**) and is aligned with the extended tongue (**12**). The rib (**13**) has a top, a side surface, a top board and a second mounting groove (**131**). The second mounting groove (**131**) is defined in the side surface facing the extended tongue (**12**). The top board is formed on the top of the rib (**13**) to make the rib (**13**) bend toward the same direction as the extended tongue (**12**).

[0028] The at least one hole (**14**) is defined in the base (**11**) at the other longitudinal side. In a preferred embodiment, two holes (**14**) are respectively defined through the base (**11**).

[0029] The two buffers (**15**,**152**) are respectively mounted in the first mounting groove (**121**) and the second mounting groove (**131**). The two buffers (**15**,**152**) may be made of rubber, Ethylene Vinyl Acetate (EVA), foam rubber or any material that can eliminate noise. The buffer (**152**) mounted in the second mounting groove (**131**) has a diameter larger than that of the buffer (**15**) mounted in the first mounting groove (**121**).

[0030] The at least one pin (**16**) is mounted respectively in the at least one hole (**14**). In a preferred embodiment, two pins (**16**) are respectively mounted through the two holes (**14**) and are securely inserted into the floor board (**20**).

[0031] With reference to FIGS. **3** and **5**, when the securing device is assembled to adjacent floor boards (**20**), the extended tongue (**12**) is mounted inside the slit (**222**) in the second connection part (**22**) in the floor board (**20**). The rib (**13**) and the base (**11**) are respectively mounted in the upper cutout (**211**) and the lower cutout (**212**) in the first connection part (**21**) of the adjacent floor board (**20**). The tongue (**221**) of the second connection part (**22**) is mounted inside the receiving recess (**122**) in the securing device (**10**) and abuts with the buffers (**15**,**152**) mounted in the mounting grooves (**121**, **131**). Finally, the pins (**16**) are respectively inserted into the floor board (**20**) through the holes (**14**). The advantages of the securing device of the present invention describe as follows.

[0032] First, to mount the buffers (**15**,**152**) in the mounting grooves (**121**, **131**) is easier than the conventional one. In manufacturing, multiple securing devices (**10**) may be made by aluminum extrusion. When the aluminum extrusion process is made, two strips of buffers (**15**,**152**) are adhered inside the grooves (**121**,**131**), then the pre-securing device (**10**) is cut into multiple pieces to obtain multiple securing devices (**10**). Accordingly, to manufacture the securing device (**10**) in accordance with the present invention is easy and convenient.

[0033] Second, with further reference to FIG. **4**, the adjacent floor board (**20**) mounted inside the receiving recess (**122**) will make the noise reduce due to the buffer (**15**) mounted inside the first mounting groove (**121**). With the arrangement of the buffer (**15**), the tongue (**221**) can be kept from bumping with the base (**11**) directly, so that noise generated during assembling the floor boards (**20**) will be reduced. In addition, the buffer (**152**) mounted in the second mounting groove (**131**) has a diameter larger than that of the other buffer (**15**) mounted in the first mounting groove (**121**), so a gap (**16**) is defined between a free end of the tongue (**221**) of the second connection part (**22**) and the side surface of the rib (**13**). The gap (**16**) may have a width in 0.3 to 0.4 millimeter (mm). With the gap (**16**) between the tongue (**221**) and the rib (**13**), an extension gap is defined between adjacent floor boards (**20**) and the expansion or contraction of the wooden floor boards (**20**) due to weather change is allowed.

[0034] It is to be understood, however, that even though numerous characteristics and advantages of the present invention have been set forth in the foregoing description, together with details of the structure and function of the invention, the disclosure is illustrative only, and changes may be made in detail, especially in matters of shape, size, and arrangement of parts within the principles of the invention to the full extent indicated by the broad general meaning of the terms in which the appended claims are expressed.

What is claimed is:

1. A securing device for combining floor boards comprising:
- a base having two longitudinal sides and a top surface,
- an extended tongue formed on one of the longitudinal sides on the top surface of the base and having
  - an inner surface, and
  - a first mounting groove defined in the inner surface of the extended tongue,
- a rib formed on the top surface of the base and aligned with the extended tongue to form a receiving recess between the extended tongue and the rib, and having a second mounting groove,
- at least one hole defined in the base at the other longitudinal side,
- two buffers respectively mounted in the first mounting groove and the second mounting groove, wherein the buffer mounted in the second mounting groove has a diameter larger than that of the buffer mounted in the first mounting groove for defining a gap between the side surface of the rib and a tongue of a floor plate when the floor plate is combined with the securing device so as to allow an expansion or contraction of adjacent floor boards due to weather change; and
- at least one pin mounted respectively in the at least one hole.

2. The securing device as claimed in claim **1**, wherein the rib is formed away from the center of the base.

3. The securing device as claimed in claim **2**, wherein the cross-section of each mounting groove is semi-circular.

4. The securing device as claimed in claim **3**, wherein each buffer is made of rubber.

5. The securing device as claimed in claim **3**, wherein each buffer is made of ethylene vinyl acetate.

6. The securing device as claimed in claim **1**, wherein the cross-section of each mounting groove is semi-circular.

7. The securing device as claimed in claim **1**, wherein each buffer is made of rubber.

8. The securing device as claimed in claim **1**, wherein each buffer is made of ethylene vinyl acetate.

* * * * *