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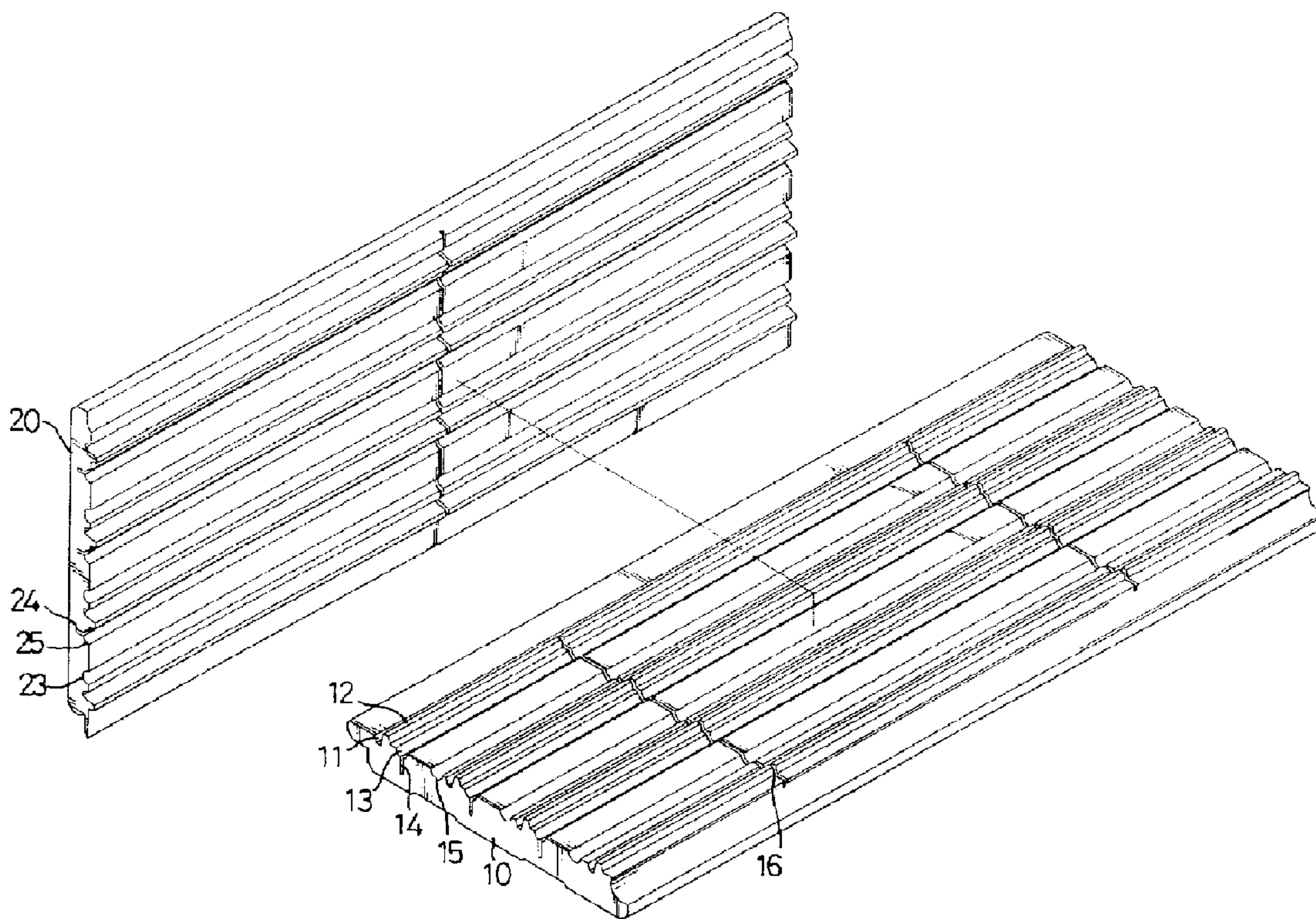
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(54) Title: TONGUE-AND-GROOVE FLOORBOARD



(57) Abrégé/Abstract:

A tongue-and-groove floorboard has a lower board (10) and an upper board (20) mated with the lower board (10). The lower board (10) and the upper board (20) each have a plurality of complementary channels (11) and ribs (12) longitudinally formed therein. Multiple recesses are defined between each lower board (10) and upper board (20), wherein the recesses are corresponding and can construct circular passages. Sound insulation material (30) is disposed in the passages in the lower board (10) and the upper board (20). A plurality of slots (16,17) is defined therein and being staggered respectively in the lower board (10) and the upper board (20). A tongue (21) is formed at one side of the lower board (10) and upper board (20), and a groove (22) is defined at the opposite side of the lower board (10) and upper board (20).

**TONGUE-AND-GROOVE FLOORBOARD****ABSTRACT OF THE DISCLOSURE**

A tongue-and-groove floorboard has a lower board (10) and an upper board (20) mated with the lower board (10). The lower board (10) and the upper board (20) each have a plurality of complementary channels (11) and ribs (12) longitudinally formed therein.

Multiple recesses are defined between each lower board (10) and upper board (20), wherein the recesses are corresponding and can construct circular passages. Sound insulation material (30) is disposed in the passages in the lower board (10) and the upper board (20). A plurality

of slots (16,17) is defined therein and being staggered respectively in the lower board (10)

and the upper board (20). A tongue (21) is formed at one side of the lower board (10) and

upper board (20), and a groove (22) is defined at the opposite side of the lower board (10) and

upper board (20).

Fig. 1

# TONGUE-AND-GROOVE FLOORBOARD

## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

The present invention is related to a tongue-and groove floorboard, and more particular to a floorboard which will not have any deformation and which can insulate sound.

### 2. Description of Related Art

Tongue-and-groove floorboards are a conventional material used in construction. A conventional tongue-and-groove floor is made of a plurality of planks, as shown in Figs. 8-9. The tongue-and-groove floorboard (60) comprises a tongue (61) formed at one narrow side of the plank and a groove (62) defined at an opposite narrow side. A plurality of channels (63) are defined in the bottom of the floorboard (60). In construction, the tongue (61) of a first floorboard (60) is matched with the groove (62) of a second floorboard (60), and the groove (62) of the first floorboard (60) is matched with the tongue (61) of a third floorboard (60). Thus, a floor comprises a plurality of tongue-and-groove floorboards fitted together in the manner described above.

However, the conventional floorboard (60) generally has deformations caused by the differences in humidity and dampness of construction areas. If the deformation is generated before the floorboards (60) prior to construction, the deformed floorboards (60) are scrapped and thus increase the costs of construction. When the deformation is generated after the floorboards (60) have been laid as a finished floor, destroyed the entire floor must be ripped up, discarded, and the work begun again.

Therefore, it is an objective of the invention to provide an improved tongue-and-groove floorboard to mitigate and/or obviate the aforementioned problems.

1 SUMMARY OF THE INVENTION

2 The main objective of the present invention is to provide a tongue-and-groove  
3 floorboard that will not deform under varying humidity and dampness.

4 Another objective of the present invention is to provide a tongue-and-groove floorboard  
5 to insulate sound.

6 Another objective of the present invention is to provide an inexpensive tongue-and-  
7 groove floorboard.

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

11 BRIEF DESCRIPTION OF THE DRAWINGS

12 Fig. 1 is an exploded view of a tongue-and-groove floorboard in accordance with the  
13 invention;

14 Fig. 2 is an exploded view of a second embodiment of the tongue-and-groove floorboard  
15 in accordance with the invention;

16 Fig. 3 is an end view of the tongue-and-groove floorboard;

17 Fig. 4 is an end view of the tongue-and-groove floorboard, wherein there is expanded  
18 material deposited in recesses ;

19 Fig. 5 is an end view of a third embodiment in accordance with the invention;

20 Fig. 6 is an end view of a fourth embodiment in accordance with the invention;

21 Fig. 7 is an end view of a fifth embodiment in accordance with the present invention;

22 Fig. 8 is a perspective view of a conventional floor; and

23 Fig. 9 is an end view of the conventional floor.

24 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

1 Referring to Figs. 1-3, a tongue-and-groove floorboard of the present invention is  
2 composed of a lower board (10) and an upper board (20).

3 The lower board (10) has a plurality of channels (11) and ribs (12) longitudinally formed  
4 in the top face thereof. The channels (11) and ribs (12) are formed in pairs and spaced apart. A  
5 plurality of recesses is defined between two pairs of channels (11) and ribs (12). In the  
6 preferred embodiment, the recesses are of two different forms a first funnel-like channel (13)  
7 and a first semi-circular channel (15) defined between two pairs of channels (11) and ribs (12).  
8 Each first funnel-like channel (13) has a first slit (14) defined at a bottom thereof.  
9 Furthermore, a plurality of slots (16) not parallel to the channels (11) and ribs (12) is defined  
10 in the top face of the lower board (10). In this embodiment, the slots (16) are perpendicular to  
11 the channels (11) and ribs (12). In another embodiment shown in Fig. 2, the slots (17) are  
12 oblique to the channels (11) and ribs (12).

13 The upper board (20) is matched with the lower board (10) and comprises a plurality of  
14 second funnel-like channels (25) and second semi-circular channels (23) to correspond to  
15 the channels (13,15) of the lower board (10). Each second funnel-like channel (25) has a  
16 second slit (24). Each first funnel-like channel (13) of the lower board (10) mates with a  
17 corresponding second semi-circular channel (23) of the upper board (20) and each second  
18 funnel-like channel (25) mates with a corresponding first semi-circular channel (15) to  
19 define a plurality of enclosed keyhole-like passages. The upper board (20) also has a plurality  
20 of perpendicular slots (16) or oblique slots (17) defined in the undersurface thereof. The slots  
21 (16, 17) in the lower board (10) and the upper board (20) are staggered and not overlapped  
22 with each other.

23 The lower board (10) and the upper board (20) are coupled together to form a tongue (21)  
24 at a first side thereof and a groove (22) at a second side opposite the first side. Sound

1 insulation material (30) is deposited in the keyhole-like passages to insulate sound, as shown  
2 in Fig. 4. The sound insulation material (30) can be PU expanded material.

3 Figures 5-7 show other embodiments of the present invention. The floor shown in Fig. 5  
4 further comprises an upper panel (40) formed on the upper board (20). The upper panel (40)  
5 is thin and can be made of another timber different from the upper board (20). For example,  
6 the lower board (10) and upper board (20) are made of an inexpensive timber and the upper  
7 panel (40) is made of an expensive timber. The floor shown in Fig. 7, besides the upper panel  
8 (40) formed on the upper board (20), further comprises a lower panel (50) formed on the  
9 bottom of the lower board (10). In the further embodiment shown in Fig. 6, only either the  
10 upper board (20) or the lower board (10) has slits (14,24) defined therein. From the above  
11 description, it is noted that the invention has the following advantages:

12 1. Because there are a channels (11), recesses (13, 15, 23, 25) and slits (14, 24) defined  
13 in the lower board (10) and upper board (20), the floor is not easy to deform when the  
14 temperature and humidity change.

15 2. The floor can insulate sound by the sound insulation material deposited in the  
16 recesses.

17 3. The floor can be made of an inexpensive timber other than the upper panel (40) to save  
18 money and benefit environmental protection.

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

1 THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE  
2 PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

3 1. A tongue-and-groove floorboard comprising a lower board (10) and upper  
4 board (20) mated with the lower board (10), said lower board (10) and said upper  
5 board (20) each comprising:

6 a plurality of channels (11) and ribs (12) longitudinally formed in pairs,  
7 wherein said channels (11) and ribs (12) in said lower board (10) and said upper  
8 board (20) are complementary;

9 a plurality of recesses defined between each lower board (10) and upper  
10 board (20), wherein said recesses in said lower board (10) and said upper board (20)  
11 are corresponding and can construct passages;

12 sound insulation material (30) deposited in the passages constructed by said  
13 recesses in said lower board (10) and said upper board (20);

14 a plurality of slots (16, 17) defined therein to intersect with said channels (11)  
15 and ribs (12) and being staggered respectively in said lower board (10) and said  
16 upper board (20);

17 a tongue (21) formed at a first side of said lower board (10) and upper board  
18 (20); and a groove (22) defined in a second side opposite the first side of said lower  
19 board (10) and upper board (20);

20 an upper panel (40) formed on said upper board (20); and

21 a lower panel (50) formed under said lower board (10),

22 wherein said recesses are semi-circular in cross-section.

23 2. The tongue-and-groove floorboard as claimed in claim 1, wherein a first  
24 plurality of said recesses are each semi-circular in cross-section and a second

1 plurality of said recesses are each semi-circular in cross-section with a slit defined in  
2 a bottom thereof, and mate with a respective one of said first plurality of recesses,  
3 wherein each said passage has a keyhole-like cross-section and said  
4 passages with keyhole-like cross-sections are arranged in an alternating manner.

5 3. The tongue-and-groove floorboard as claimed in claim 2, wherein said upper  
6 panel (40) is thinner than said lower board (10) and upper board (20), and is made of  
7 timber different from that of said upper and lower boards (10, 20).

8 4. The tongue-and groove floorboard as claimed in claim 3, wherein the sound  
9 insulation material is a PU material.

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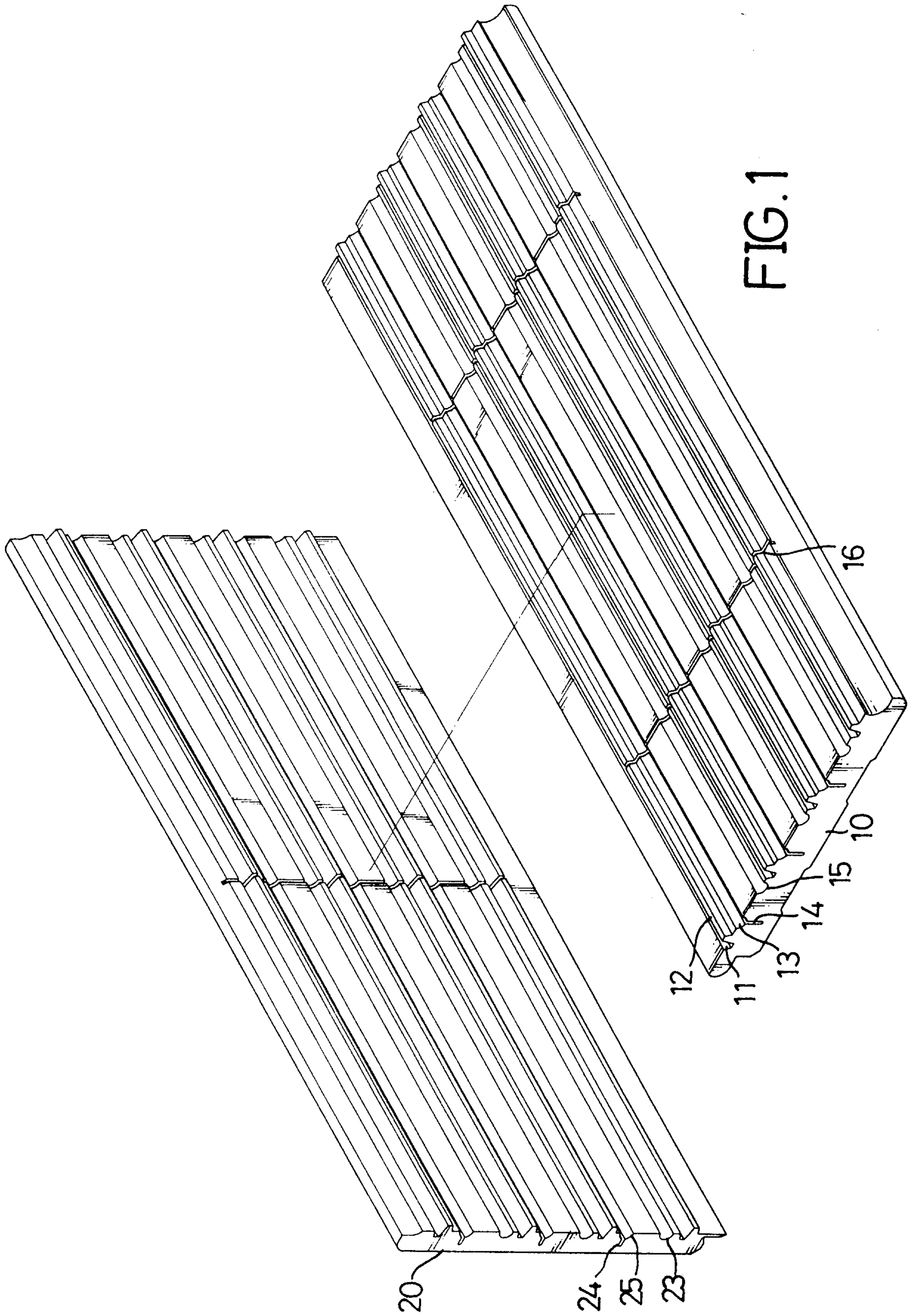


FIG. 1

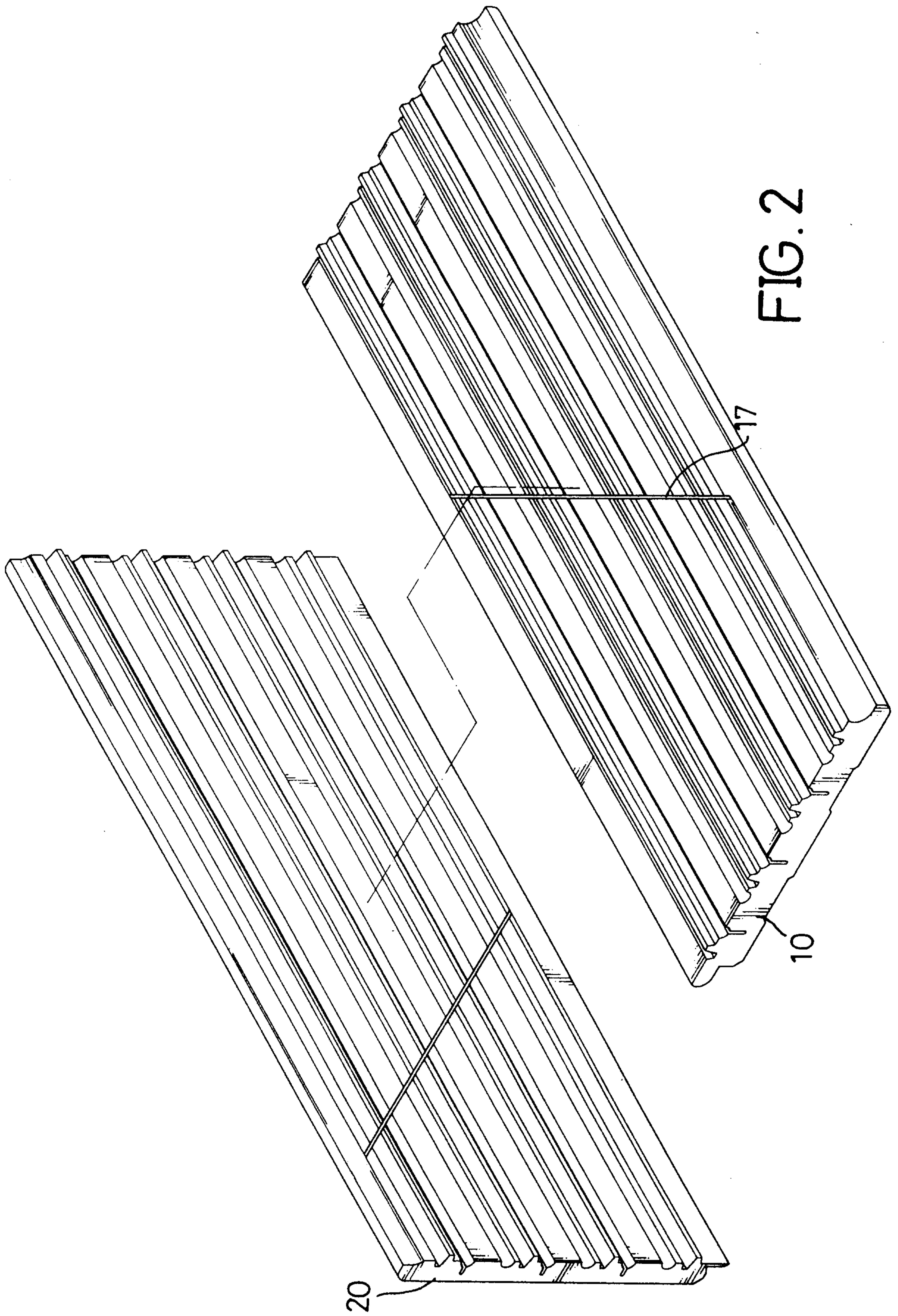


FIG. 2

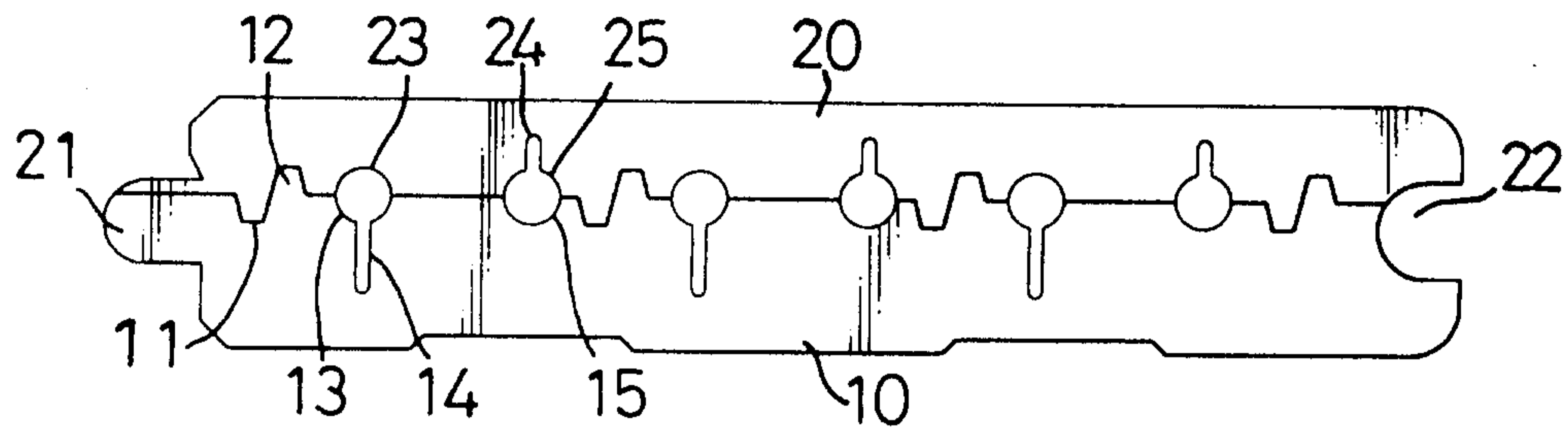


FIG. 3

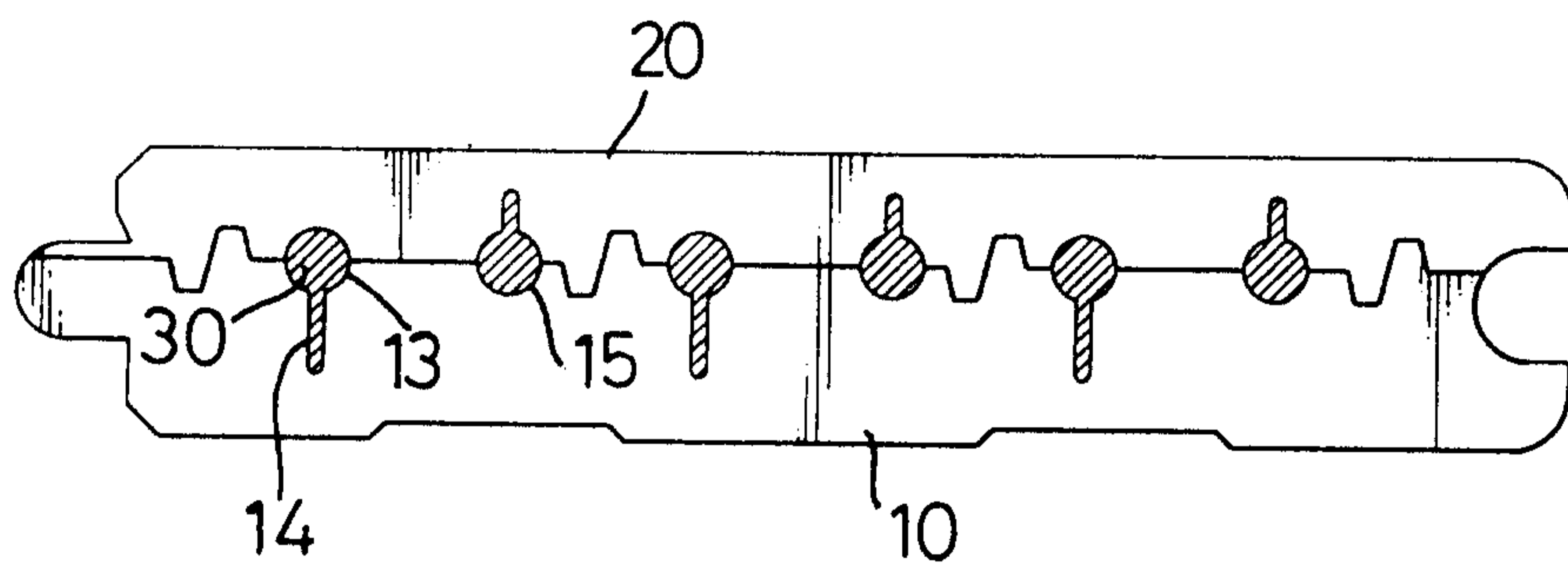


FIG. 4

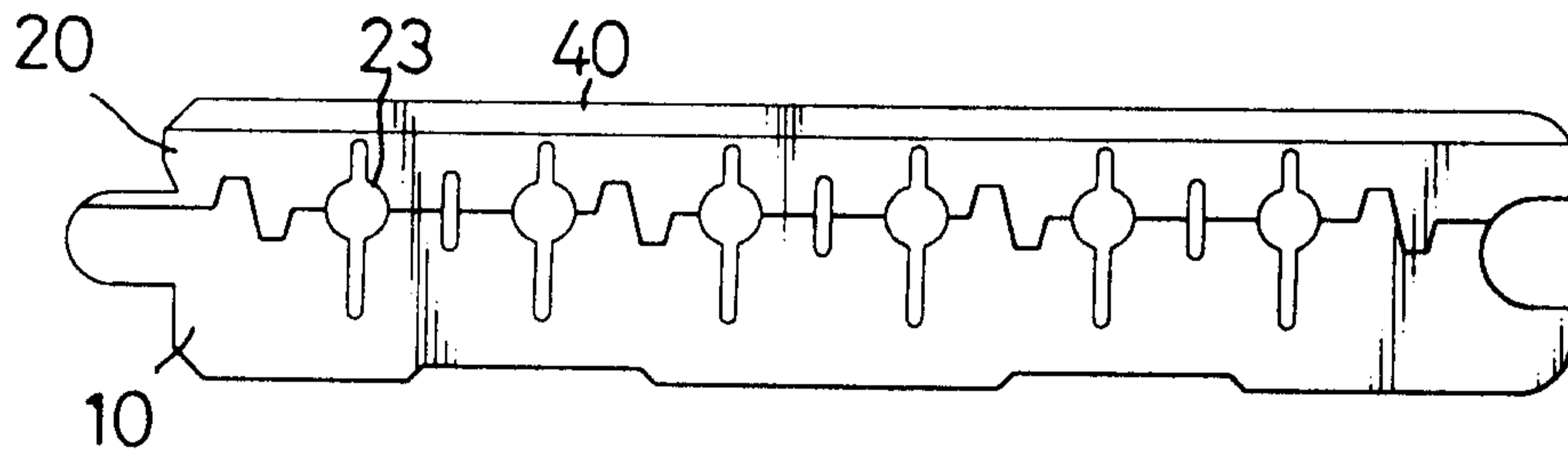


FIG. 5

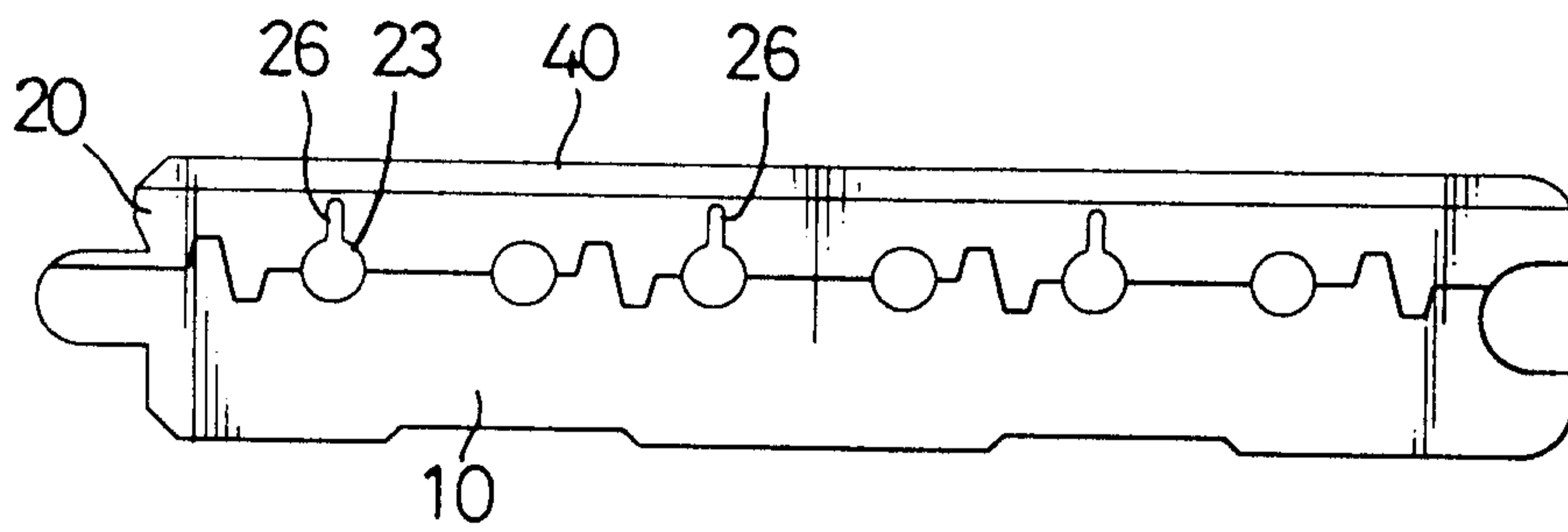


FIG. 6

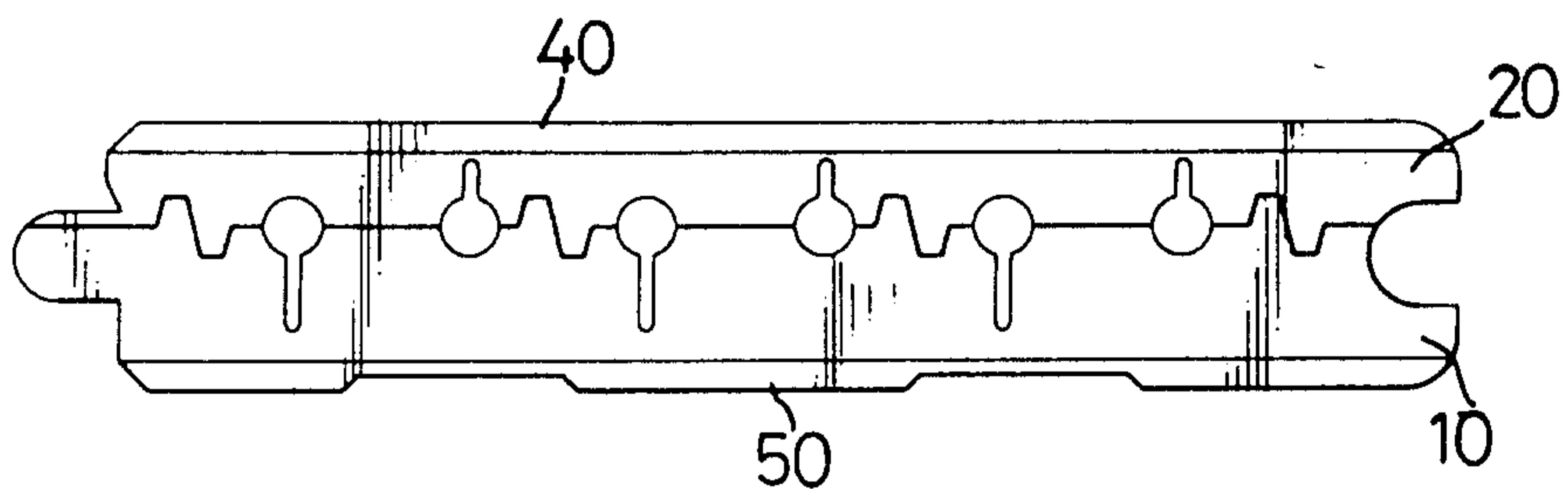


FIG. 7

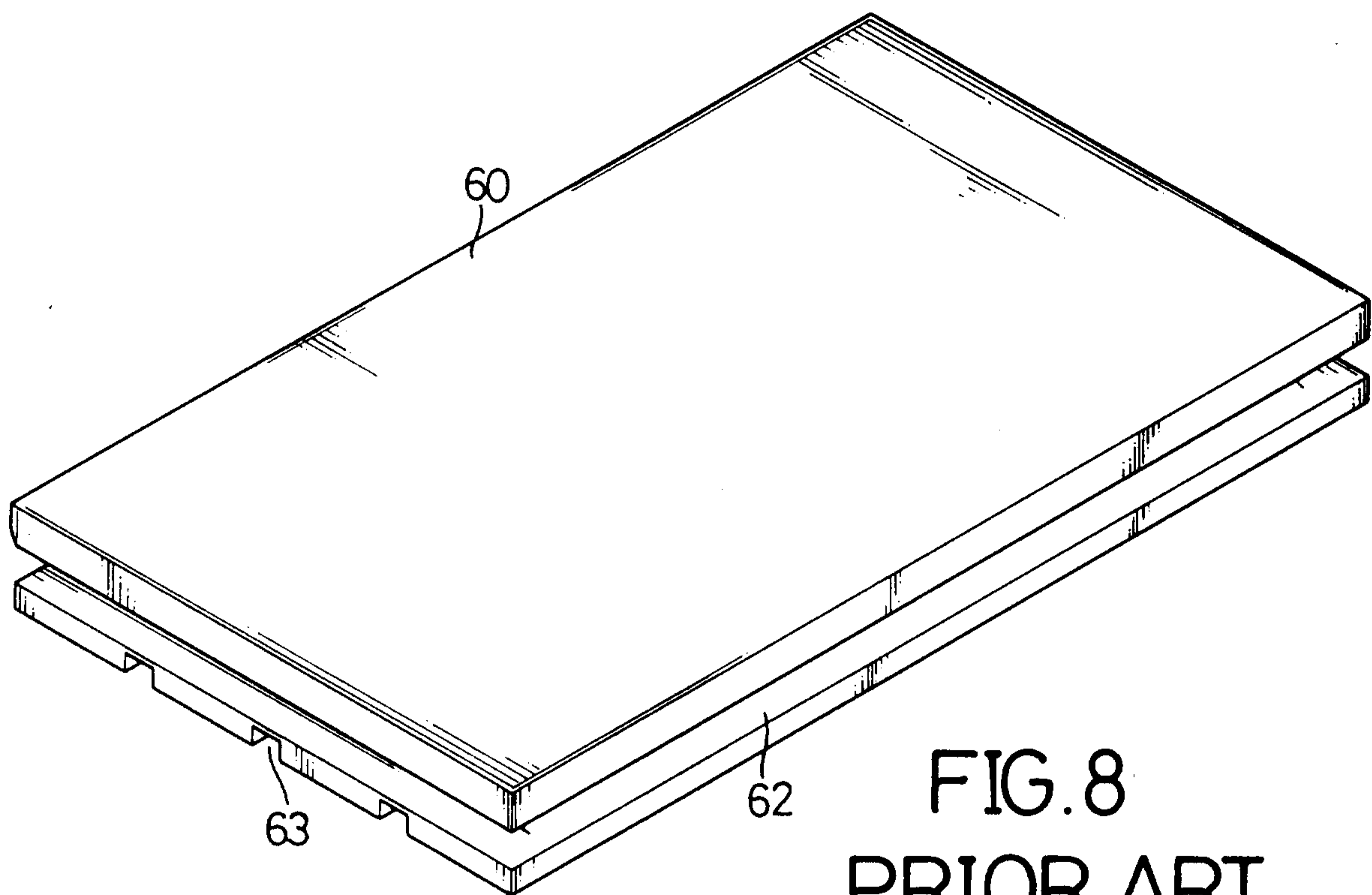


FIG. 8  
PRIOR ART

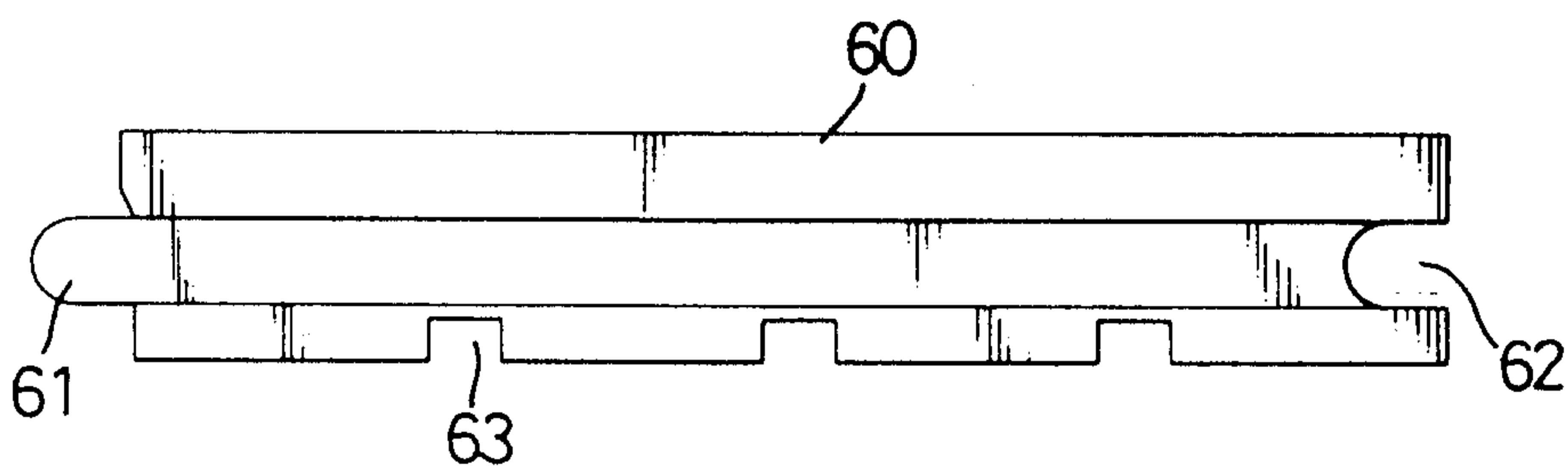


FIG. 9  
PRIOR ART

