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(54) **METHOD FOR PROVIDING MULTILAYER TOPS FOR TABLES AND DOORS AND FURNISHINGS AND PARTITIONS, AND MULTILAYER TOPS FOR TABLES AND DOORS AND FURNISHINGS AND PARTITIONS**

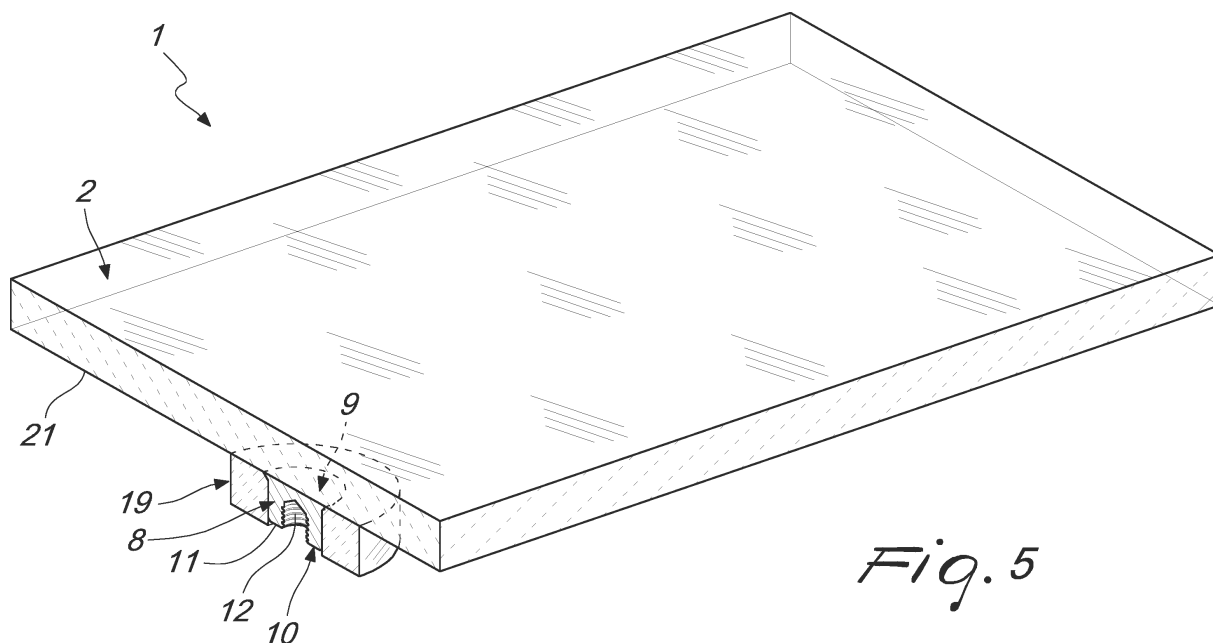
(57) The present application relates to a method for the production of glass tops 1, 1^I, 1^{II}, 1^{III} for tables and doors and furnishings and partitions and glass tops 1, 1^I, 1^{II}, 1^{III} for tables and doors and furnishings and partitions.

The method comprises, also in different sequences, the following steps:

- obtaining at least one glass panel 2;

- obtaining at least one glass block 19, 19^I provided with a through seat 4, 4^I;

- inserting, in the through seat 4, 4^I, a complementarily shaped bushing 8, 8^I, 8^{II}, 8^{III}, made of metal or plastic, comprising a head 9, 9^I and a shank 10, 10^{II}, 10^{III}, said head 9, 9^I having a first planar upper surface 18, 18^I configured so as to align with a second upper surface 20, 20^I of said glass block 19, 19^I.

*Fig. 5*

Description

[0001] The present application relates to a method for the provision of glass tops for tables and doors and furnishings and partitions and glass tops for tables and doors and furnishings.

[0002] Nowadays, it is known to make multilayer tops comprising, as shown in Figures 1 and 2, for example a top 101 of a table whereby an upper countertop 102, e.g. made of stoneware, is coupled with a lower countertop 103 made of glass by means of, for example, double-sided adhesive 113 or glues or by layering in an autoclave or in a vacuum.

[0003] At the lower surface 150 of the lower glass countertop 103, it is known to associate, e.g. in proximity to the corners and by means of a two-component glue, a cylindrical metal plate 151 on the lower surface 152 of which a threaded seat 153 is formed, at which a screw is associated for clamping the top 101 e.g. to a frame or to the legs constituting the table.

[0004] The plates thus constitute anchorage points for the surface 101 to the frame or legs of a table or other surfaces.

[0005] Such prior art is subject to various drawbacks: in fact, even though the bonding strength between the metal plate 151 and the lower glass countertop 103 is normally high, detachments occur due to both improper use and accidental causes, or even to possible major thermal shock events.

[0006] The use of glass in combination with other materials, such as steel or aluminium, results in structural instability, as the different thermal expansion leads over time to deformations that can lead to the decoupling of the two components.

[0007] Also known is document US4778702A, which describes a system for bonding adhesive elements to surfaces, particularly composite materials, involving an enlarged base to improve adhesion and a mounting device that applies constant pressure via a spring, ensuring safe, uniform, reliable and long-lasting bonding. The main aim of the present invention is therefore to solve the technical problems highlighted, eliminating the drawbacks of the mentioned prior art, thus devising a method for making glass tops for tables and doors and furnishings that have high structural stability over time and are versatile.

[0008] Within the above aim, another important object of the invention is to devise a method for the cost-efficient production of glass tops for tables, doors and furnishings with high structural stability over time and versatility.

[0009] Yet another object is to obtain a method for obtaining glass tops for tables and doors and furnishings that is quick and easy to implement.

[0010] The aim and objects mentioned, as well as others that will appear more clearly later, are achieved, according to a first aspect, by a method according to claim 1 and, according to a second aspect, by a glass

top according to claim 11. According to a third aspect, the present invention concerns a method for making glass tops 1, 1^I, 1^{II}, 1^{III} for tables and doors and furnishings and partitions.

[0011] Preferably, this method comprises the step of obtaining at least one glass panel 2. Preferably, this method comprises the step of obtaining at least one glass block 19, 19^I provided with a through seat 4, 4^I.

[0012] Preferably, this method involves inserting into said through seat 4, 4^I a complementarily shaped bushing 8, 8^I, 8^{II}, 8^{III}, made of metal or plastic, comprising a head 9, 9^I and a shank 10, 10^{II}, 10^{III}.

[0013] Preferably, said head 9, 9^I has a first planar upper surface 18, 18^I configured to align with a second upper surface 20, 20^I of said glass block 19, 19^I.

[0014] Preferably, this method involves coupling said at least one glass block 19, 19^I and said at least one glass panel 2 by means of an adhesive, preferably a UV glue, to obtain said glass top 1, 1^I, 1^{II}, 1^{III},

[0015] In a fourth aspect, the present invention relates to a glass top 1, 1^I, 1^{II}, 1^{III} for tables and doors and furnishings and partitions.

[0016] Preferably, said glass top 1, 1^I, 1^{II}, 1^{III} comprises at least one glass panel 2 and at least one glass block 19, 19^I.

[0017] Preferably, said glass block 19, 19^I has a through seat 4, 4^I for a complementarily shaped bushing 8, 8^I, 8^{II}, 8^{III}, made of metal or plastic, comprising a head 9, 9^I and a shank 10, 10^{II}, 10^{III}.

[0018] Preferably, said head 9, 9^I has a first planar upper surface 18, 18^I configured to align, in situ, with a second upper surface 20, 20^I of said glass block 19, 19^I. Preferably, said at least one glass block 19, 19^I is coupled to said glass panel 2 using an adhesive, preferably a UV glue.

[0019] Optionally, the invention, as defined by any one of the preceding aspects, may be provided with one or more of the features of the dependent claims.

[0020] Further features and advantages of the invention shall be more apparent from the detailed description of a particular, but not exclusive, embodiment, illustrated by way of non-limiting example in the accompanying drawings, in which:

Fig. 1 shows a partially sectioned three-quarter side view of a prior art;

Fig. 2 shows a cross-sectional view of the solution in Figure 1;

Fig. 3 shows an exploded view of a glass top with a partially sectioned view of the glass panel;

Fig. 4 shows a three-quarter side view of the assembled components of the glass top shown in Figure 3;

Fig. 5 shows the solution in the previous figure, in a three-quarter side view partially sectioned in a plane diametrical to the seat;

Fig. 6 shows the glass top in the previous figure in a front view of the section;

Fig. 7 shows a three-quarter side view of the bushing to be associated with the glass top in Figures 3, 4, 5 and 6;

Figure 8 shows an exploded view of a different embodiment of a glass top with a partially sectioned glass panel;

Fig. 9 shows a three-quarter side view of the assembled components of the glass top in the previous figure;

Fig. 10 shows the solution in the previous figure, in a three-quarter side view partially sectioned in a plane diametrical to the seat;

Fig. 11 shows the glass top in the previous figure in a front view of the section;

Fig. 12 shows a three-quarter side view of the bushing of the glass top in Figures 8, 9, 10 and 11;

Fig. 13 shows an exploded view of a different embodiment of a glass top with the glass panel partially sectioned;

Fig. 14 shows a three-quarter side view of the assembled components of the glass top in the previous figure;

Fig. 15 shows the solution in the previous figure, in a three-quarter side view partially sectioned in a plane diametrical to the seat;

Fig. 16 shows the glass top in the previous figure in a front view of the section;

Fig. 17 shows a three-quarter side view of the bushing of the glass top in Figures 13, 14, 15 and 16;

Fig. 18 shows an exploded view of a different embodiment of a glass top with the glass panel partially sectioned;

Fig. 19 shows a three-quarter side view of the assembled components of the glass top in the previous figure;

Fig. 20 shows the solution shown in the previous figure, in a three-quarter side view partially sectioned in a plane diametrical to the seat;

Fig. 21 shows the glass top in the previous figure in a front view of the section;

Fig. 22 shows a three-quarter side view of the bushing of the glass top in Figures 18, 19, 20 and 21.

[0021] In the illustrated embodiments, individual characteristics, reported in relation to specific examples, can actually be interchanged with other different characteristics, existing in other embodiments.

[0022] With reference to the above-mentioned figures, the numbers 1, 1^I, 1^{II}, 1^{III} denote a glass top for tables or doors or a furnishing component in general, which is obtained by means of a method involving an initial step of obtaining at least one glass panel 2.

[0023] The method then involves a second step, either simultaneous with or preceding the first, of obtaining at least one glass block 19, 19^I having a through seat 4, 4^I, as shown in Figure 3, Figure 8, Figure 13

and Figure 18.

[0024] The glass block 19, 19^I has a polygonal shape, preferably cylindrical or square.

[0025] In the particular embodiments illustrated, a through seat 4, 4^I was considered to be obtained from the second upper surface 20, 20^I of the glass block 19, 19^I.

[0026] On the through seat 4, 4^I a first region 6, 6^I is provided, shaped like an inverted truncated cone or parallelepiped followed by a second cylindrical region 7.

[0027] In the particular embodiments shown in Figures 3 to 7 and 13 to 16, the through seat 4 has a substantially Y-like shape.

[0028] The first region 6 of the through seat 4 is shaped like an inverted truncated cone. The first region 6 has a conformation in which the larger end face of the truncated cone lies, in situ, at the second upper surface 20 of the glass block 19 and the smaller end face of the truncated cone is internal to and contained in the glass block 19 itself.

[0029] The larger end face of the first region 6 advantageously has a smaller diameter than that of the glass block 19.

[0030] The size of the first region 6 may vary according to specific requirements.

[0031] The second region 7 advantageously has a diameter equal to that of the smaller end face of the truncated cone defined by the first region 6.

[0032] In the particular embodiments shown in Figures 8 to 12 and 18 to 22, the through seat 4^I has a substantially T-like shape.

[0033] The first region 6^I of the through seat 4^I has a parallelepiped shape with a rectangular plan.

[0034] The first region 6^I has a shape in which the upper end face of the parallelepiped lies, in situ, at the second upper surface 20^I of the glass block 19^I and the lower end face of the parallelepiped is internal to and contained in the glass block 19^I itself.

[0035] The upper end face of the first region 6^I, which has a rectangular shape, advantageously has a length of the longer sides substantially equal to the diameter of the glass block 19^I.

[0036] The second region 7 advantageously has a smaller diameter than the glass block 19^I.

[0037] The size of the first region 6^I will vary according to specific requirements.

[0038] The through seat 4, 4^I and the first region 6, 6^I may also have other plan shapes such as, e.g., polygonal shapes.

[0039] The method then involves a third step, following the second step, of inserting a complementarily shaped insert, metal or plastic, consisting of a bushing 8, 8^I, 8^{II}, 8^{III}, into the through seat 4, 4^I.

[0040] This bushing 8, 8^I, 8^{II}, 8^{III} is for example made of steel or aluminium or another resilient material.

[0041] This bushing 8, 8^I, 8^{II}, 8^{III} comprises a head 9, 9^I and a shank 10, 10^{II}, 10^{III}.

[0042] In the particular embodiments shown in Figures 3 to 7 and 13 to 17, the bushing 8, 8^{II} has a substantially Y-like shape and is complementarily shaped to the through seat 4.

[0043] The head 9 of the bushing 8, 8^{II} is complementarily shaped to the first region 6 of the through seat 4.

[0044] The shank 10, 10^{II} of the bushing 8, 8^{II} is complementarily shaped to the second region 7 of the through seat 4.

[0045] In the particular embodiments shown in Figures 8 to 12 and 18 to 22, the bushing 8^I, 8^{III} has a substantially T-like shape.

[0046] The bushing 8^I, 8^{III} is complementarily shaped to the through seat 4^I.

[0047] The head 9^I of the bushing 8^I, 8^{III} is complementarily shaped to the first region 6^I of the through seat 4^I.

[0048] The shank 10, 10^{III} of the bushing 8^I, 8^{III} is complementarily shaped to the second region 7 of the through seat 4^I.

[0049] The head 9, 9^I has a continuous and planar first upper surface 18, 18^I which, in situ, is flush with the second upper surface 20, 20^I of the glass block 19, 19^I.

[0050] The first upper surface 18, 18^I of the head 9, 9^I of the bushing 8, 8^I, 8^{II}, 8^{III} is positioned, in situ, flush with the second lower surface 21 of the overlying glass panel 2 to form a planar and continuous surface between the head 9, 9^I of the bushing 8, 8^I, 8^{II}, 8^{III} and the second lower surface 21 of the glass panel 2.

[0051] In the particular embodiments shown in Figures 3 to 12, a blind threaded groove 12 is provided axially at the first lower surface 11 of the shank 10.

[0052] In the particular embodiment shown in Figures 13 to 17 at the first lower surface 11^{II} of the shank 10^{II} of the bushing 8^{II} a turned plug 17 protrudes axially, on the opposite side to said head 9.

[0053] The turned plug 17 protrudes below the lower third surface 22 of the block 19. The turned plug 17 has a smaller diameter than the diameter of the shank 10^{II} of the bushing 8^{II}.

[0054] In the particular embodiment shown in Figures 18 to 22 at the first lower surface 11^{III} of the shank 10^{III} of the bushing 8^{III} an externally threaded portion 16 protrudes axially, on the opposite side to said head 9^I.

[0055] The portion 16 protrudes below the lower third surface 22 of the block 19^I.

[0056] The portion 16 has a smaller diameter than the diameter of the shank 10^{III} of the bushing 8^{III}.

[0057] The method then includes a fourth step, following the third step, in which a coupling of said at least one glass block 19, 19^I and said glass top 2 is carried out using a UV glue to obtain said glass top 1, 1^I, 1^{II}, 1^{III}.

[0058] The glass block 19, 19^I and the glass panel 2 allow the rays that activate the UV glue to pass through, ensuring the structural coupling stability of

said two elements.

[0059] The method enables a glass top 1, 1^I, 1^{II}, 1^{III} to be obtained, which can be quickly and safely coupled to tables and doors and to furnishings and partitions, since once the glass panel 2 and the glass block 19, 19^I are coupled together, the bushing 8, 8^I, 8^{II}, 8^{III} becomes a stud which, by means of the coupling to the same one of suitable counter-threaded screws to said blind threaded groove 12 or suitable counter-threaded nuts to said turned plug 17 or to said portion 16 will withstand the tensile or shear stresses perpendicular to the glass top 1, 1^I, 1^{II}, 1^{III}.

[0060] In addition, it will withstand the stresses caused by friction between the bushing 8, 8^I, 8^{II}, 8^{III} and the walls of the through seat 4, 4^I.

[0061] In practice, it was found that the invention achieved the above-mentioned aim and objects, as a method was obtained that allows glass tops 1, 1^I, 1^{II}, 1^{III} for tables and doors and furnishings to be made with a high degree of structural stability over time.

[0062] It was also found that the invention achieved the aforementioned aim and objects by producing a glass top 1, 1^I, 1^{II}, 1^{III} for tables and doors and furnishings that exhibits high structural stability over time.

[0063] In particular, the high structural stability over time is achieved thanks to the glass block 19, 19^I, which guarantees a long-lasting bond with the glass panel 2 because the glass block 19, 19^I and the glass panel 2 have the same thermal expansion coefficient and are therefore not subject to detachment due to thermal shock events.

[0064] In addition, the high structural stability over time is achieved by bonding the glass block 19, 19^I and glass panel 2 using UV glues that have higher performance than two-component glues.

[0065] In fact, UV glues can be used in such solutions, since both the glass block 19, 19^I and the glass panel 2 allow UV rays to pass through them, activating the UV glue and ensuring the stability of the coupling between said two elements.

[0066] In addition, the high structural stability over time is also achieved thanks to the particular conformation of the bushing 8, 8^I, having the blind threaded groove 12 axially protruding from the first lower surface 11 of the shank 10, and thanks to the particular conformation of the bushing 8^{II}, 8^{III}, having the turned plug 17 or the portion 16 axially protruding from the first lower surface 11^{II}, 11^{III} of the shank 10^{II}, 10^{III} of the bushing 8^{II}, 8^{III}.

[0067] Such conformations in fact guarantee continuity of the upper surface of the head 9, 9^I of the bushing 8, 8^I, 8^{II}, 8^{III} allowing optimal adhesion thereof to the second lower surface 21 of the glass panel 2 and thus guaranteeing optimal resistance of the bonding to the rotational stress exerted on the bushing 8, 8^I, 8^{II}, 8^{III} by screwing the screws onto it.

[0068] It was also found that the shape of the bushing 8, 8^I, 8^{II}, 8^{III} eliminated the problems of breakage

and possible perforation of the glass panel 2 during the screwing of the screw into the bushing 8, 8^I, 8^{II}, 8^{III} since, with the blind conformation of the threaded groove 12 or the turned plug 17 or the portion 16, the screw or nut can never, during screwing into the bushing 8, 8^I, 8^{II}, 8^{III}, come into contact with the glass panel 2 and accidentally break it.

[0069] The method is also simple and quick to implement, and enables the cost-effective production of glass tops 1, 1^I, 1^{II}, 1^{III} for tables and doors and furnishings. Naturally, the materials used as well as the dimensions constituting the individual components of the invention may be more relevant depending on the specific requirements.

[0070] The different means to perform certain different functions will certainly not only have to co-exist in the illustrated embodiment, but may in themselves be present in many embodiments, even those not illustrated.

[0071] Features indicated as advantageous, appropriate or similar may also be missing or replaced by equivalent ones.

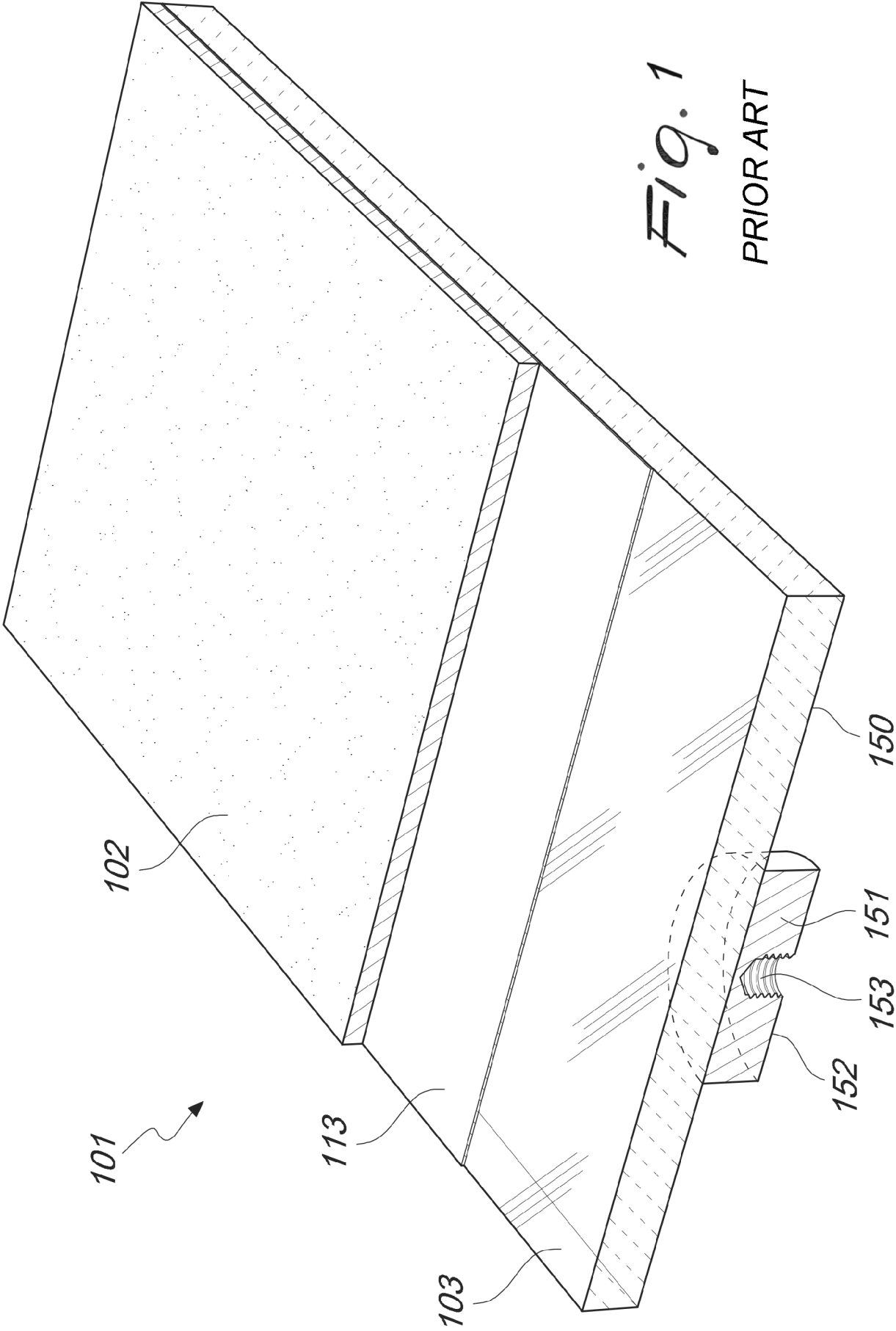
Claims

1. A method for the provision of glass tops (1, 1^I, 1^{II}, 1^{III}) for tables and doors and furnishing accessories and partitions, **characterized in that** it comprises, even in a mutually different sequence, the following steps:
 - obtaining at least one glass panel (2);
 - obtaining at least one glass block (19, 19^I) provided with a through seat (4, 4^I);
 - inserting, in said through seat (4, 4^I), a complementarily shaped bushing (8, 8^I, 8^{II}, 8^{III}), made of metal or plastic, comprising a head (9, 9^I) and a shank (10, 10^{II}, 10^{III}), said head (9, 9^I) having a first planar upper surface (18, 18^I) configured so as to align with a second upper surface (20, 20^I) of said glass block (19, 19^I).
2. The method according to claim 1, which is **characterised by** coupling said at least one glass block (19, 19^I) and said at least one glass panel (2) by means of an adhesive, preferably a UV glue, to obtain said glass top (1, 1^I, 1^{II}, 1^{III}).
3. The method according to claim 1 or 2 wherein a blind threaded groove (12) is provided axially at the first lower surface (11) of said shank (10) of said bushing (8, 8^I).
4. The method according to any one of the preceding claims, **characterised in that** a turned plug (17) or an externally threaded portion (16) protrudes axi-

ally at the first lower surface (11^{II}, 11^{III}) of said shank (10^{II}, 10^{III}) of said bushing (8^{II}, 8^{III}), on the opposite side to said head (9, 9^I).

5. The method according to claim 4, which is **characterised in that** the insertion of said bushing (8^{II}, 8^{III}) in said through seat (4, 4^I) provides that said turned plug (17) or said portion (16) protrudes below the third lower surface (22) of said block (19, 19^I).
6. The method according to any one of the preceding claims, **characterized in that** the insertion of said bushing (8, 8^I, 8^{II}, 8^{III}) into said through seat (4, 4^I) provided starting from said second upper surface (20, 20^I) of said glass block (19, 19^I) provides that said first upper surface (18, 18^I) of said head (9, 9^I) of said bushing (8, 8^I, 8^{II}, 8^{III}) is positioned flush with said second upper surface (20, 20^I) of said glass block (19, 19^I).
7. The method according to any one of the preceding claims, **characterised in that** said at least one glass block (19, 19^I) is coupled to said at least one glass panel (2) by a coupling that provides that said first upper surface (18, 18^I) of said head (9, 9^I) of said bushing (8, 8^I, 8^{II}, 8^{III}), inserted into said glass block (19, 19^I), is positioned flush with said second lower surface (21) of said overlying glass panel (2) to form a flat and continuous surface between said head (9, 9^I) and said second lower surface (21).
8. The method according to any one of the preceding claims, **characterised in that** said through seat (4, 4^I), having a substantially Y-like or substantially T-like shape, has a first region (6, 6^I) shaped like an inverted truncated cone or parallelepiped followed by a second cylindrical region (7).
9. The method according to claim 8 **characterized in that** the insertion of said bushing (8, 8^I, 8^{II}, 8^{III}) into said through seat (4, 4^I) provides that the larger end face of the truncated cone of said first region (6) or the upper end face of the parallelepiped of said first region (6^I) lies on the second upper surface (20, 20^I) of said glass block (19, 19^I) and the smaller end face of the truncated cone of said first region (6) or the lower end face of the parallelepiped of said first region (6^I) is internal to and contained in said glass block (19, 19^I).
10. The method according to claim 8 **characterized in that** said bushing (8, 8^I, 8^{II}, 8^{III}) has a substantially Y-like or substantially T-like shape whose head (9, 9^I) is shaped complementarily to said first region (6, 6^I) and whose shank (10, 10^{II}, 10^{III}) is shaped complementarily to said second region (7).

11. A glass top (1, 1^I, 1^{II}, 1^{III}) for tables and doors and furnishings and partitions **characterized in that** it comprises at least one glass panel (2) and at least one glass block (19, 19^I) having a through seat (4, 4^I) for a complementarily shaped bushing (8, 8^I, 8^{II}, 8^{III}), made of metal or plastic, comprising a head (9, 9^I) and a shank (10, 10^{II}, 10^{III}), said head (9, 9^I) having a first planar upper surface (18, 18^I) configured in such a way as to align, in situ, with a second upper surface (20, 20^I) of said glass block (19, 19^I). 5
12. The glass top (1, 1^I, 1^{II}, 1^{III}) according to claim 11 **characterized in that** said at least one glass block (19, 19^I) is coupled to said glass panel (2) by means of an adhesive, preferably a UV glue. 10
13. The glass top (1, 1^I) according to claim 11 or 12 **characterized in that** a blind threaded groove (12) is provided axially at the first lower surface (11) of said shank (10) of said bushing (8, 8^I). 20
14. The glass top (1^{II}, 1^{III}) according to any one of claims 11 to 12, **characterized in that** a turned plug (17) or an externally threaded portion (16) protrudes axially at the first lower surface (11^{II}, 11^{III}) of said shank (10^{II}, 10^{III}) of said bushing (8^{II}, 8^{III}), on the opposite side to said head (9, 9^I). 25
15. The glass top (1^{II}, 1^{III}) according to claim 14 **characterized in that** said turned plug (17) or said portion (16) protrudes below the third lower surface (22) of said glass block (19, 19^I). 30
16. The glass top (1, 1^I, 1^{II}, 1^{III}) according to any one of claims 11 to 15 **characterized in that** said through seat (4, 4^I) is provided starting from the second upper surface (20, 20^I) of said glass block (19, 19^I). 35
17. The glass top (1, 1^I, 1^{II}, 1^{III}) according to one or more of the preceding claims, **characterized in that** said first upper surface (18, 18^I) of said head (9, 9^I) of said bushing (8, 8^I, 8^{II}, 8^{III}) is positioned flush with the second upper surface (20, 20^I) of said glass block (19, 19^I). 40
18. The glass top (1, 1^I, 1^{II}, 1^{III}) according to any one of claims 11 to 17 **characterized in that** said first upper surface (18, 18^I) of said head (9, 9^I) of said bushing (8, 8^I, 8^{II}, 8^{III}) is positioned flush with the second lower surface (21) of said overlying glass panel (2) to form a planar and continuous surface between said head (9, 9^I) of said bushing (8, 8^I) and said second lower surface (21) of said glass panel (2). 45
19. The glass top (1, 1^I, 1^{II}, 1^{III}) according to any one of claims 11 to 18, **characterized in that** said through seat (4, 4^I), having a substantially Y-shaped or substantially T-shaped conformation, has a first region (6, 6^I) shaped like an inverted truncated cone or parallelepiped followed by a second cylindrical region (7). 50
20. The glass top (1, 1^{II}) according to claim 19 **characterized in that** said first region (6) has a shape in which the larger end face of the truncated cone lies on the second upper surface (20) of said glass block (19) and the smaller end face of the truncated cone is internal to and contained in said glass block (19). 55
21. The glass top (1^I, 1^{III}) according to claim 19 **characterized in that** said first region (6^I) has a conformation in which the upper end face of the parallelepiped lies on the second upper surface (20^I) of said glass block (19^I) and the lower end face of the parallelepiped is internal to, and contained in, said glass block (19^I). 60
22. The glass top (1, 1^I, 1^{II}, 1^{III}) according to claim 19, which is **characterized in that** said bushing (8, 8^I, 8^{II}, 8^{III}) has a substantially Y-like or substantially T-like shape whose head (9, 9^I) is shaped complementarily to said first region (6, 6^I) and whose shank (10, 10^{II}, 10^{III}) is shaped complementarily to said second region (7). 65
23. The glass top (1^I, 1^{III}) according to any one of claims 11 to 22 **characterized in that** said first region (6^I) has a rectangular parallelepiped shape which accommodates said complementarily shaped head (9^I) of said bushing (8^I, 8^{III}), which therefore has a substantially T-like shape. 70



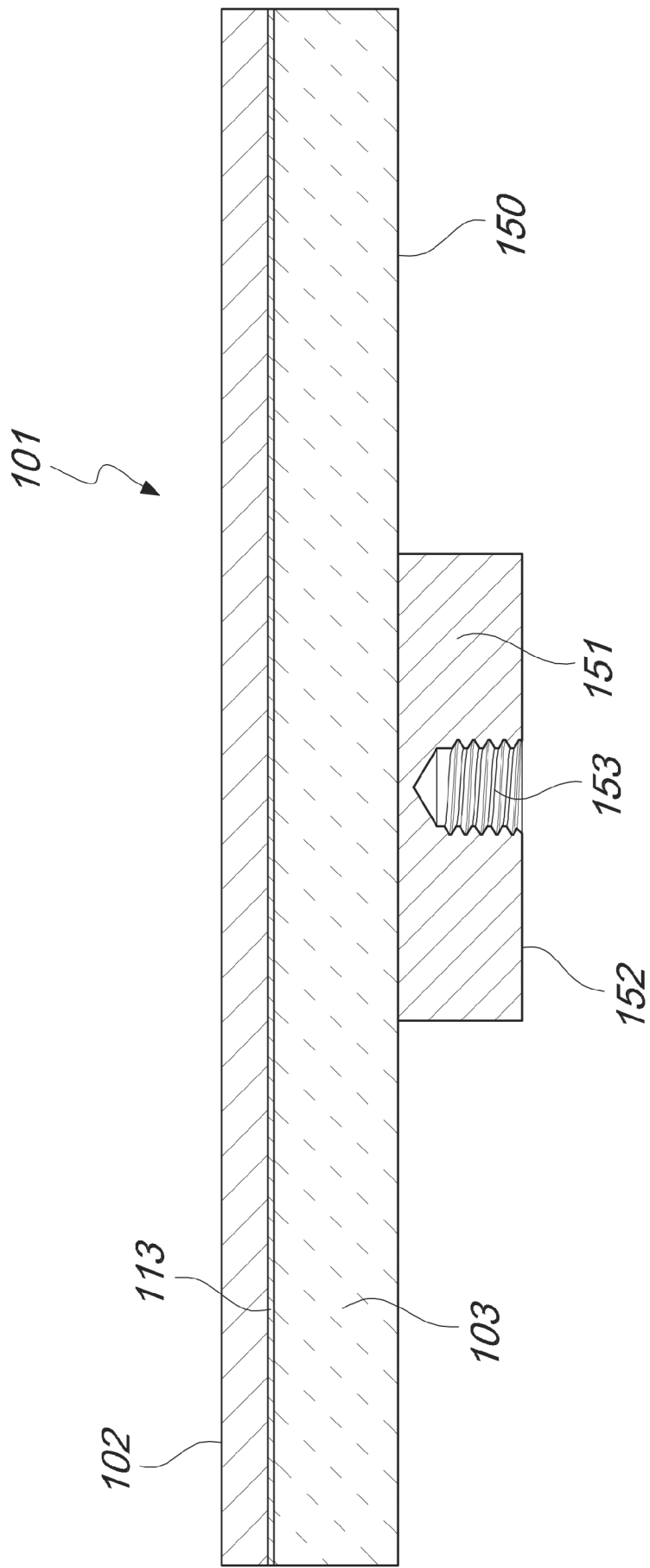
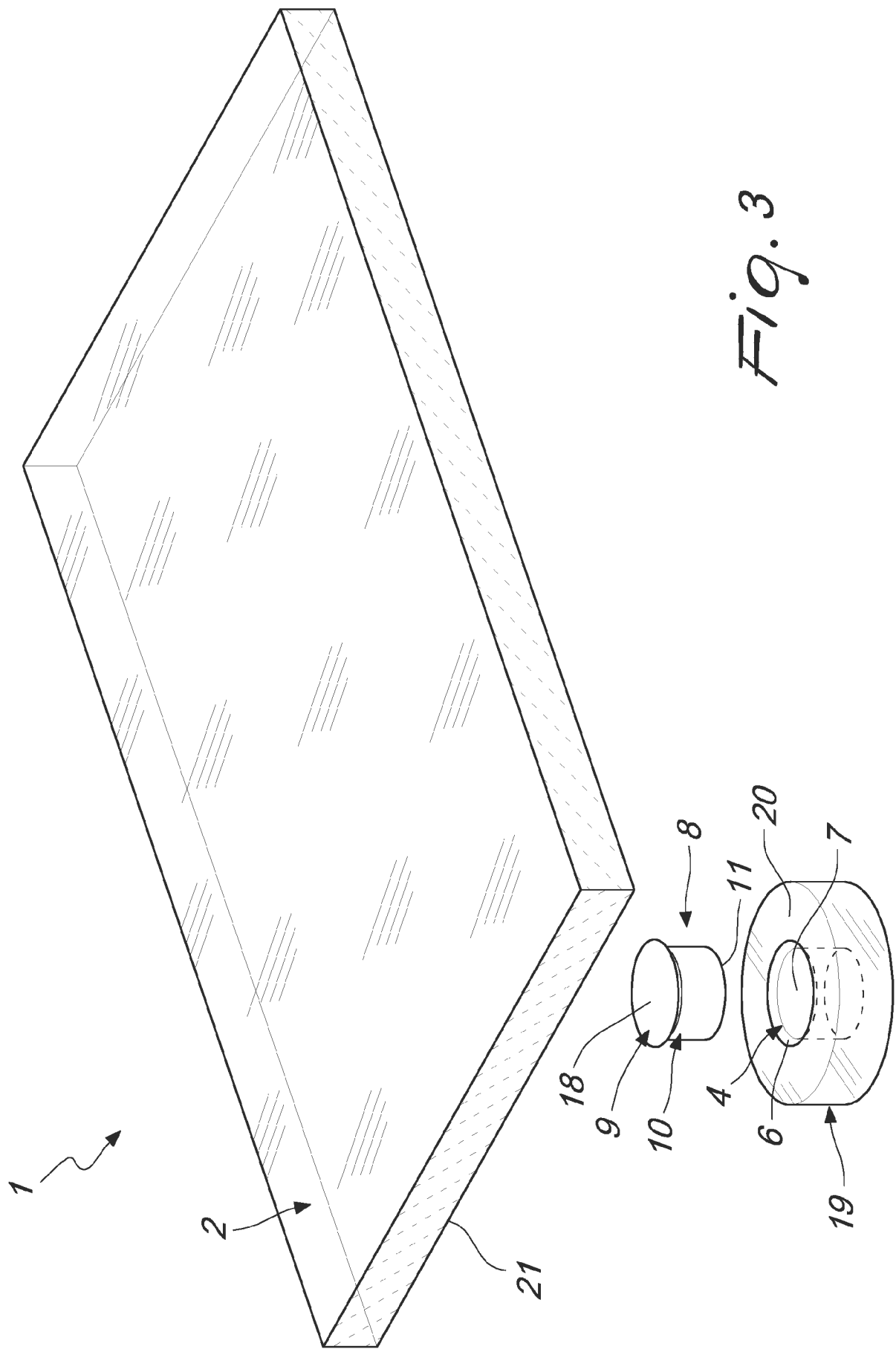


Fig. 2
PRIOR ART



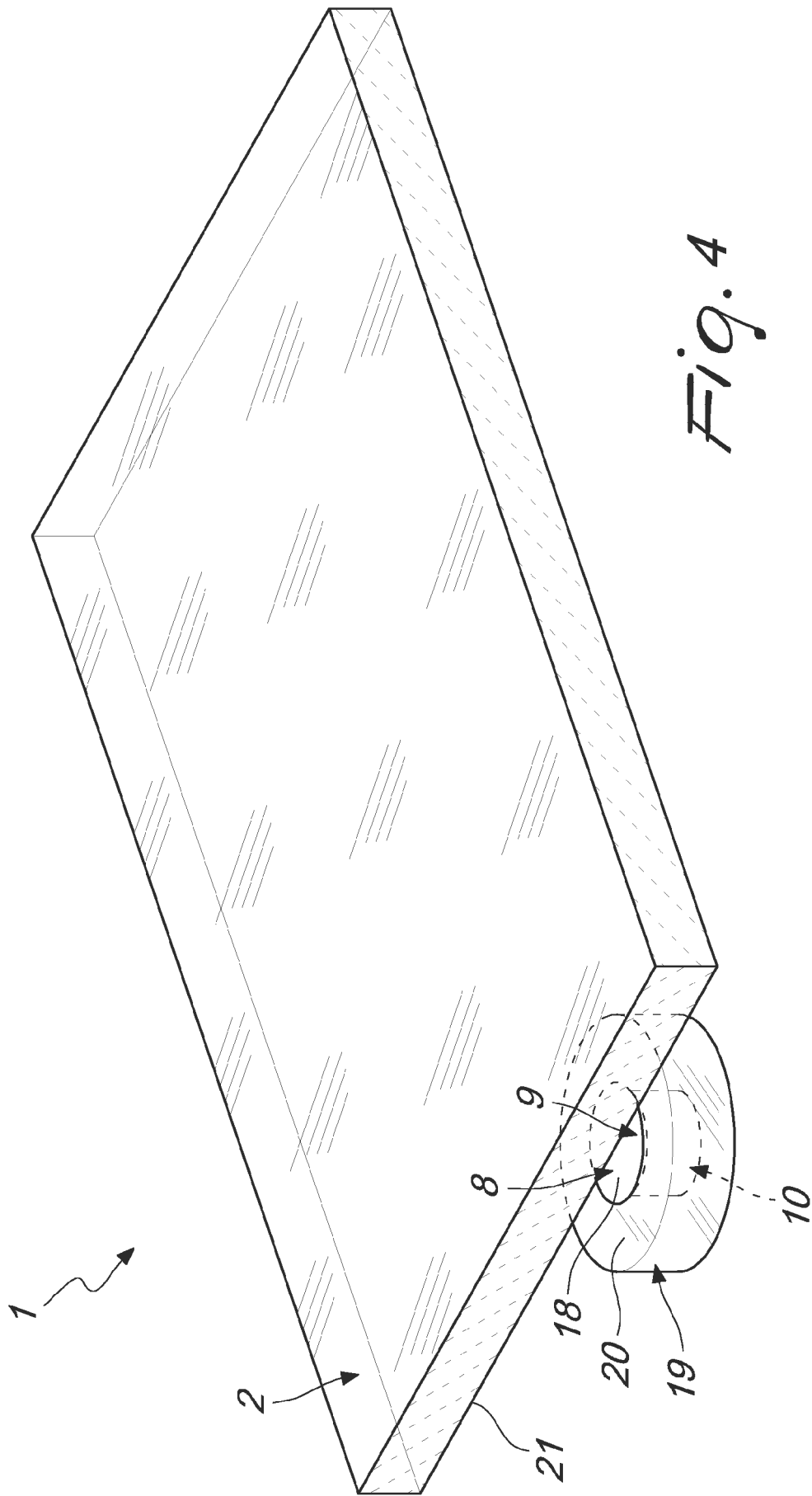
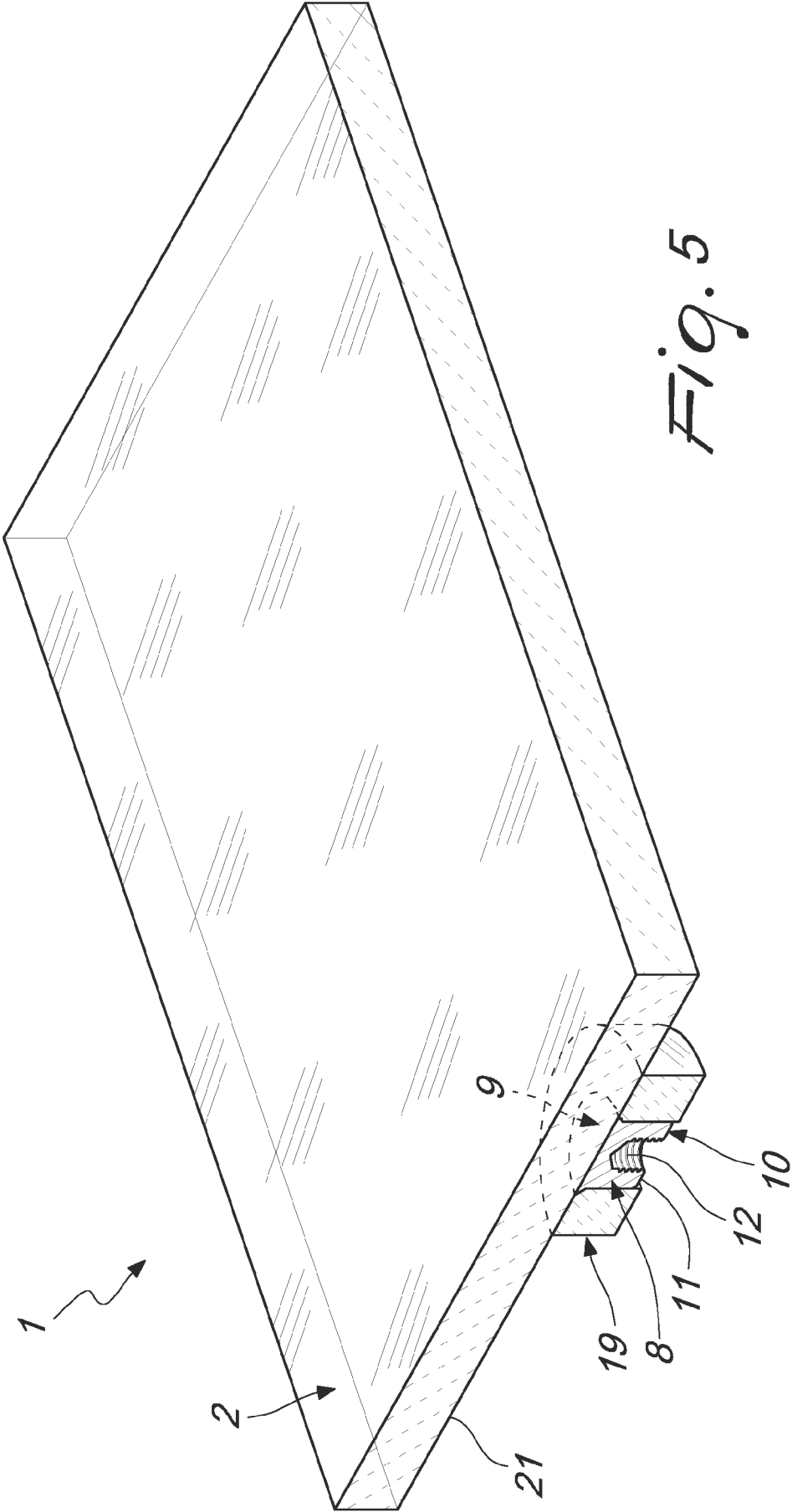


Fig. 4



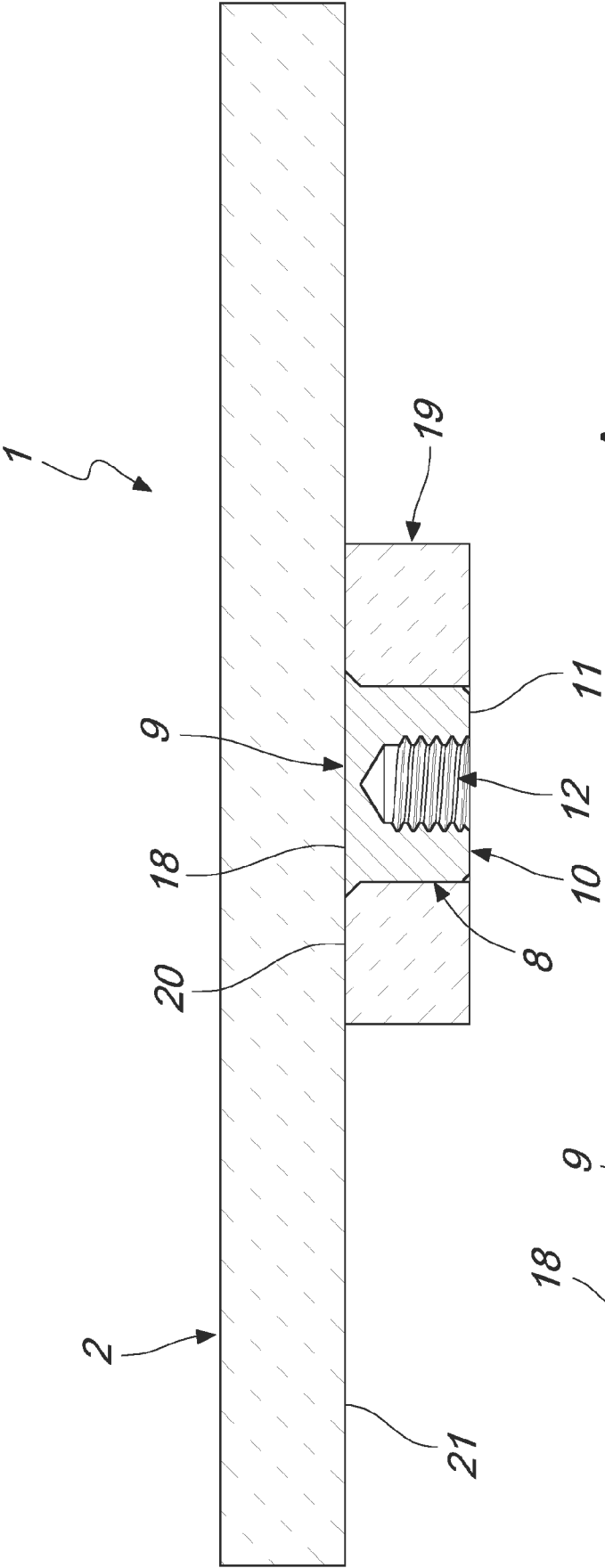


Fig. 6

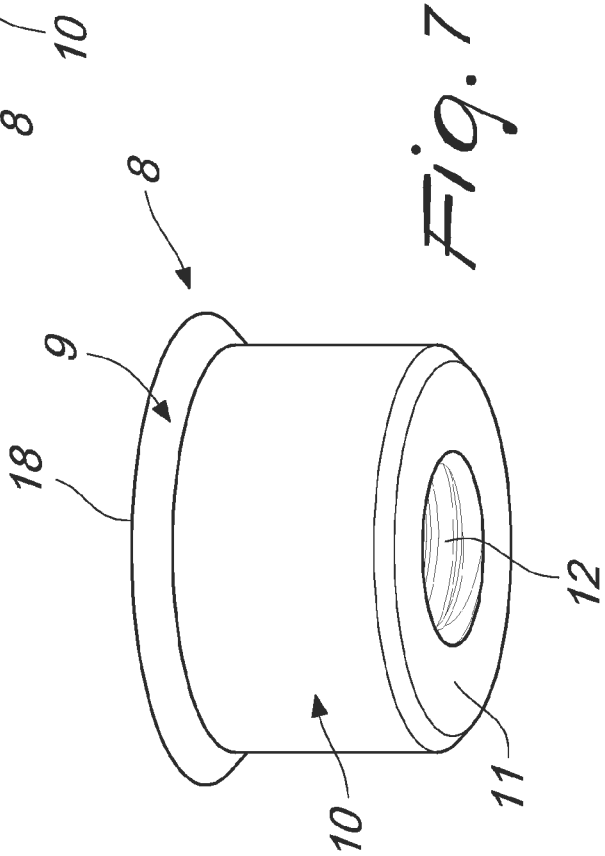
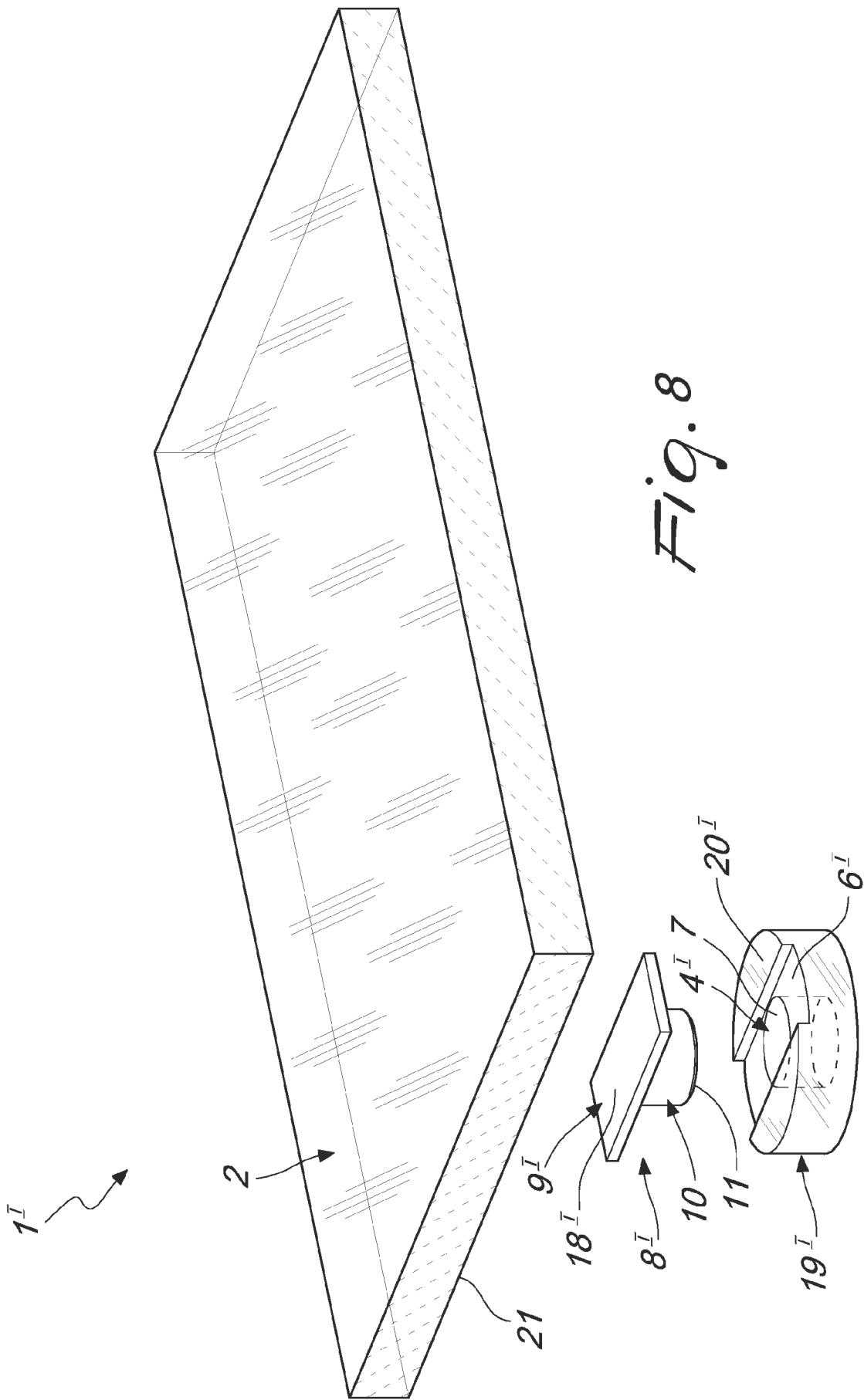
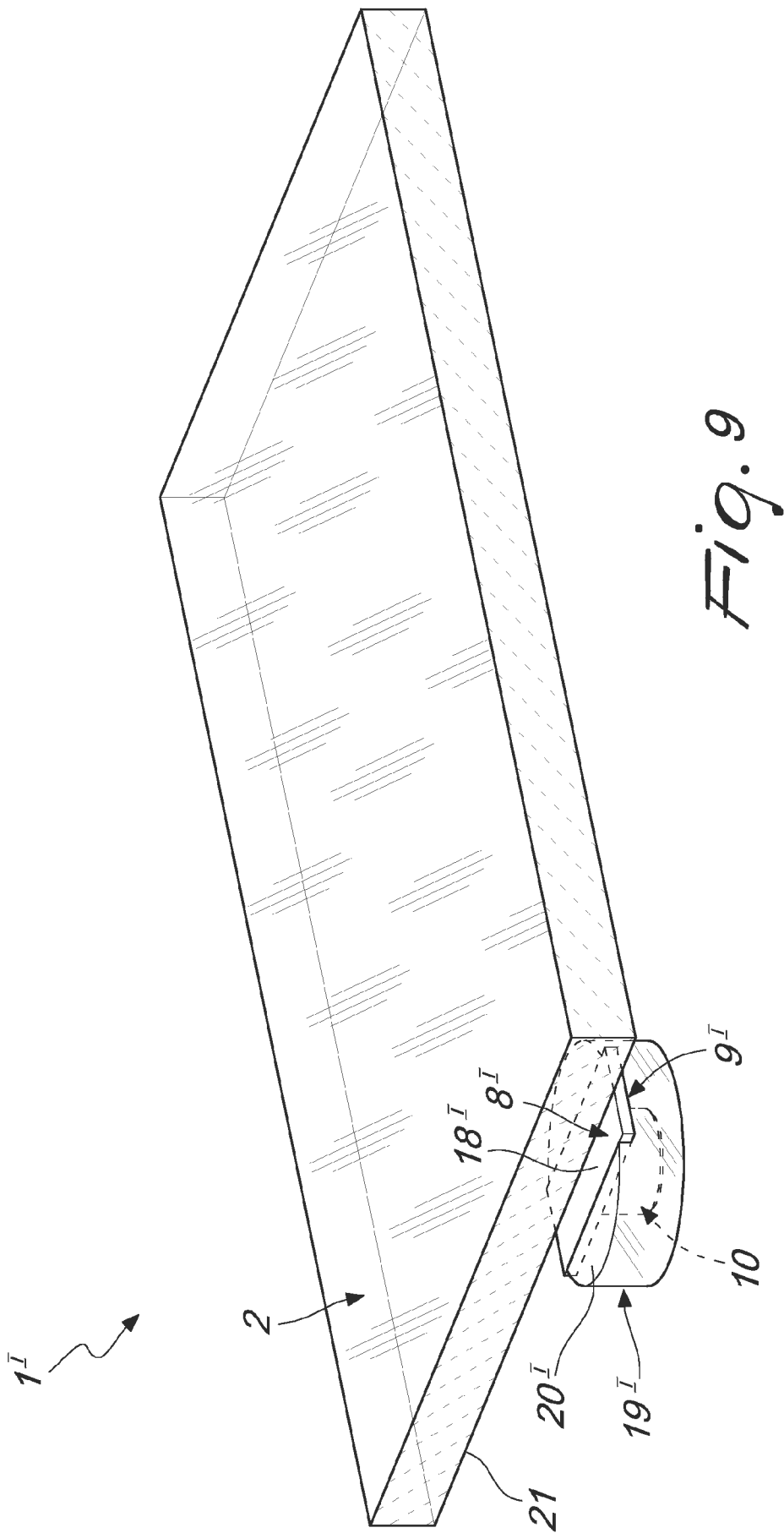
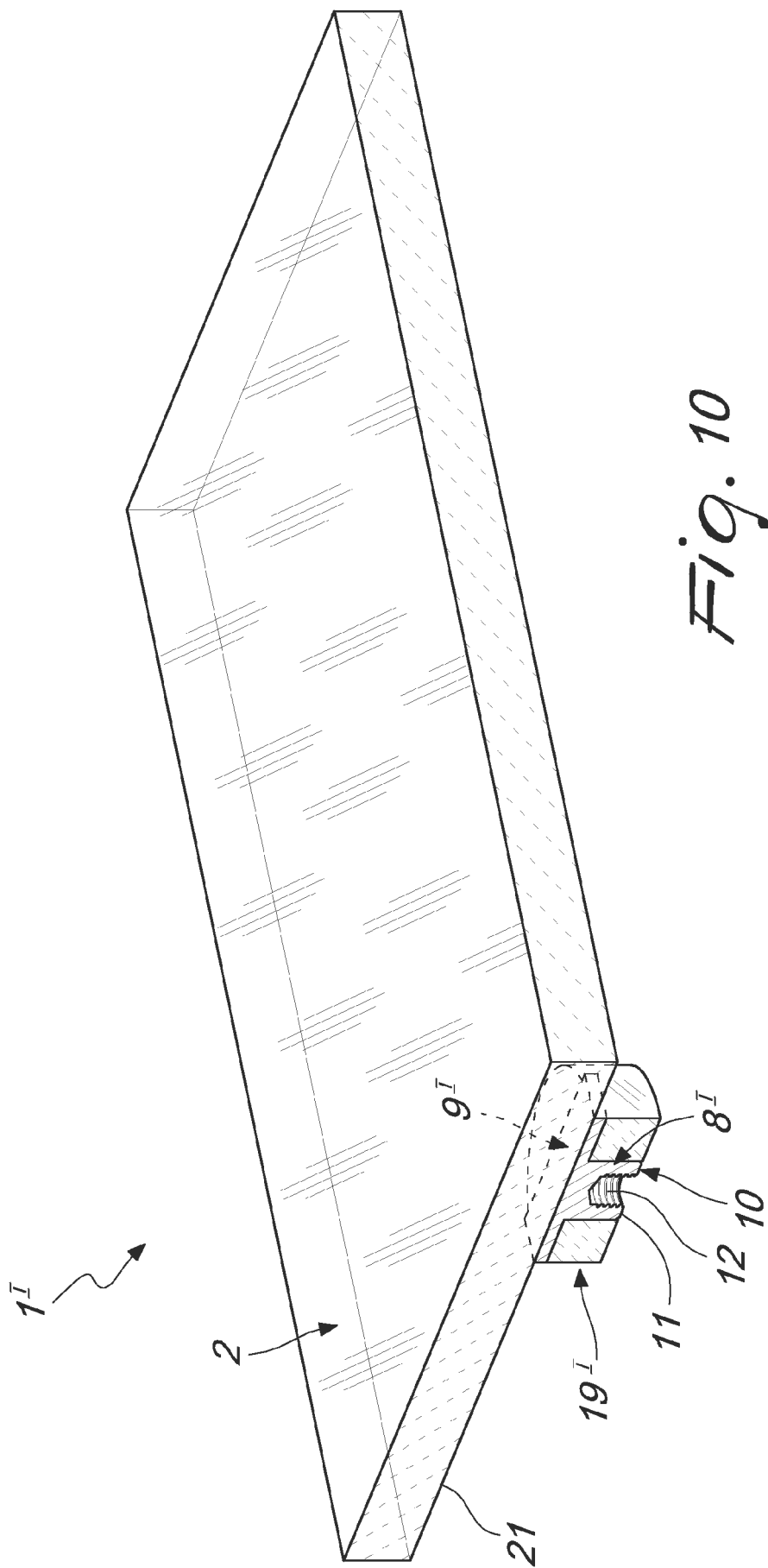
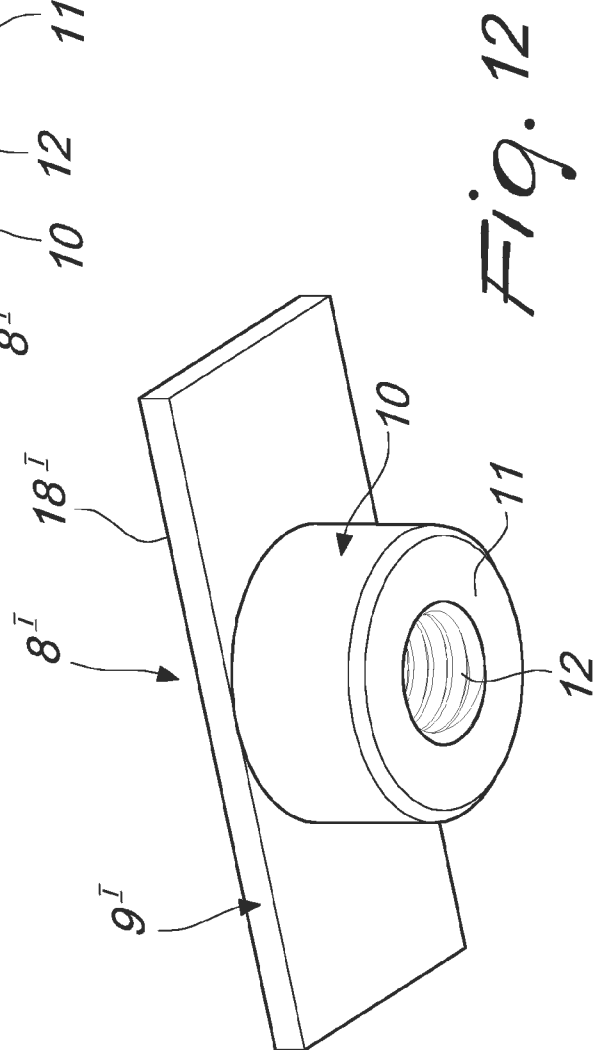
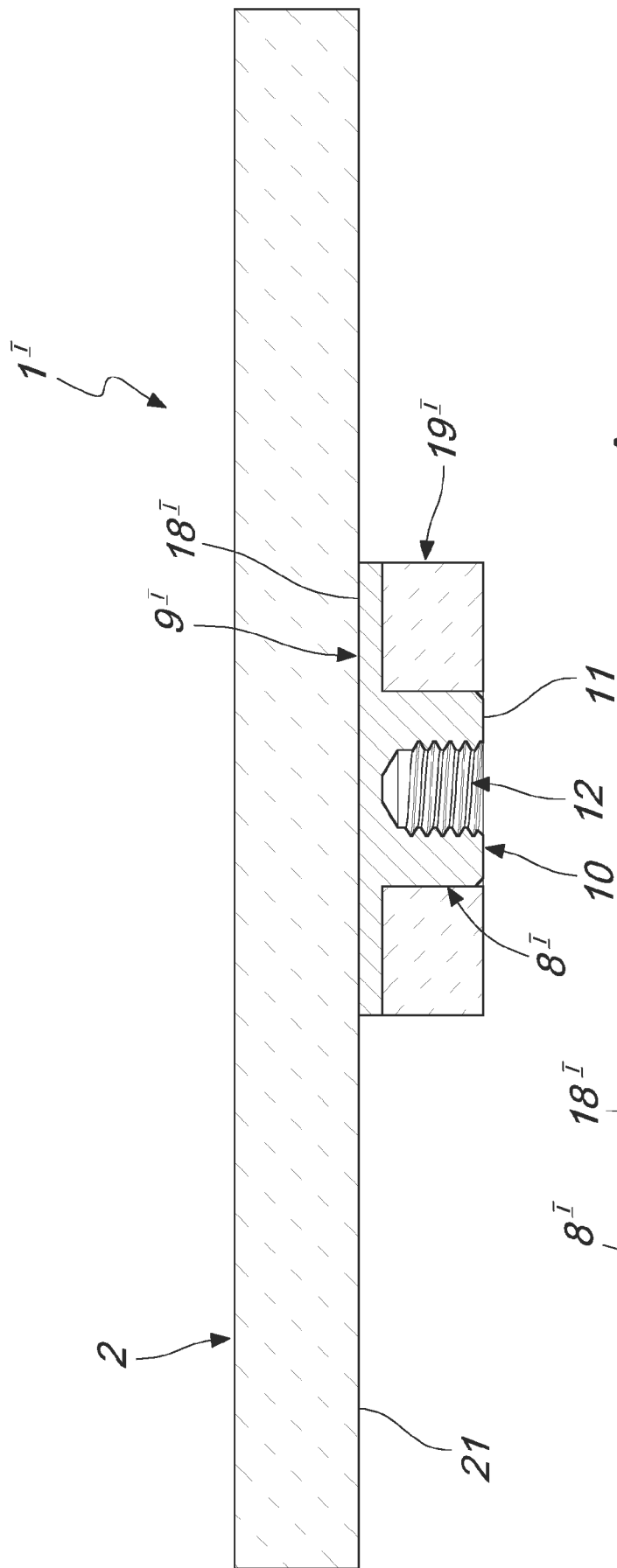


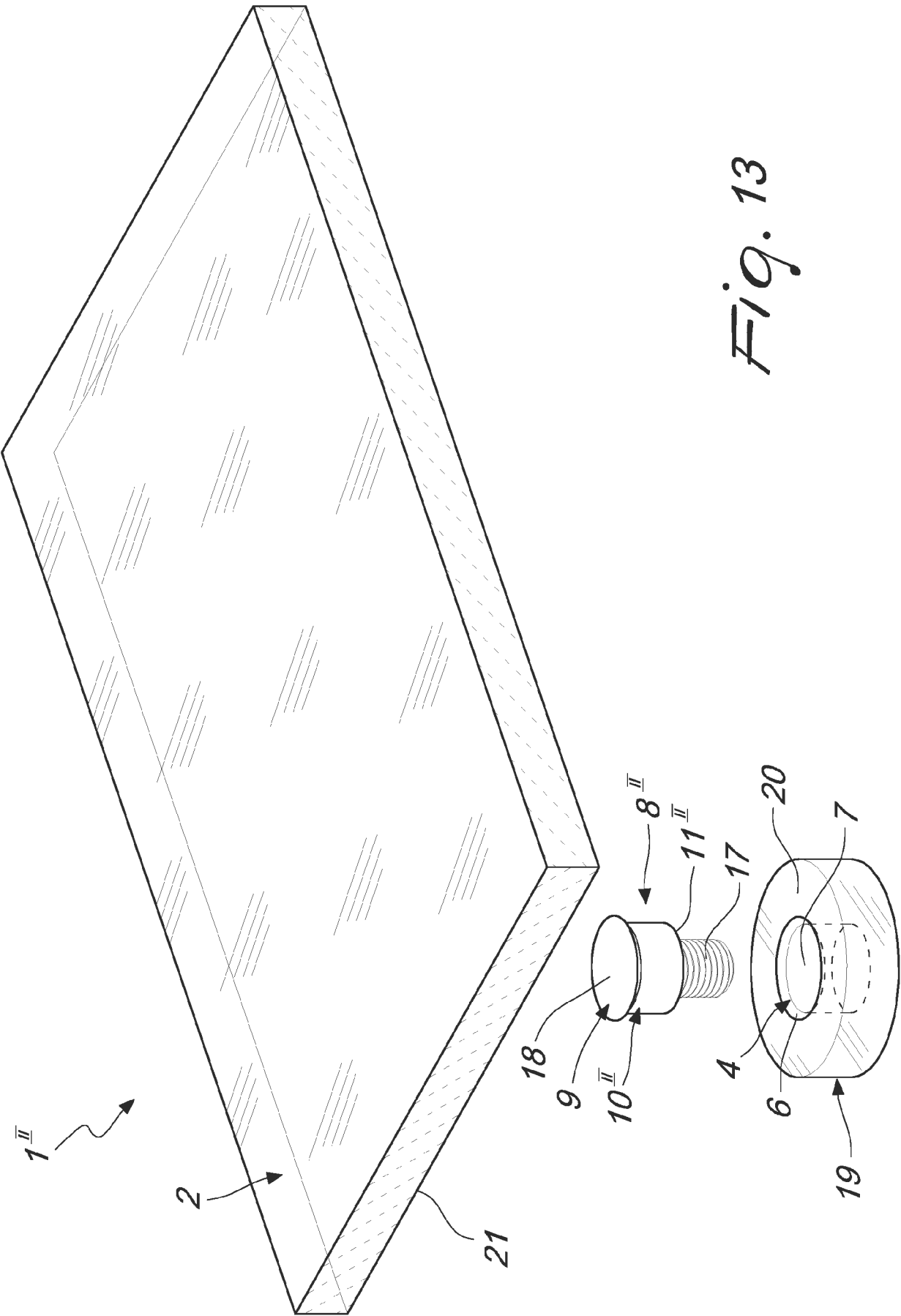
Fig. 7











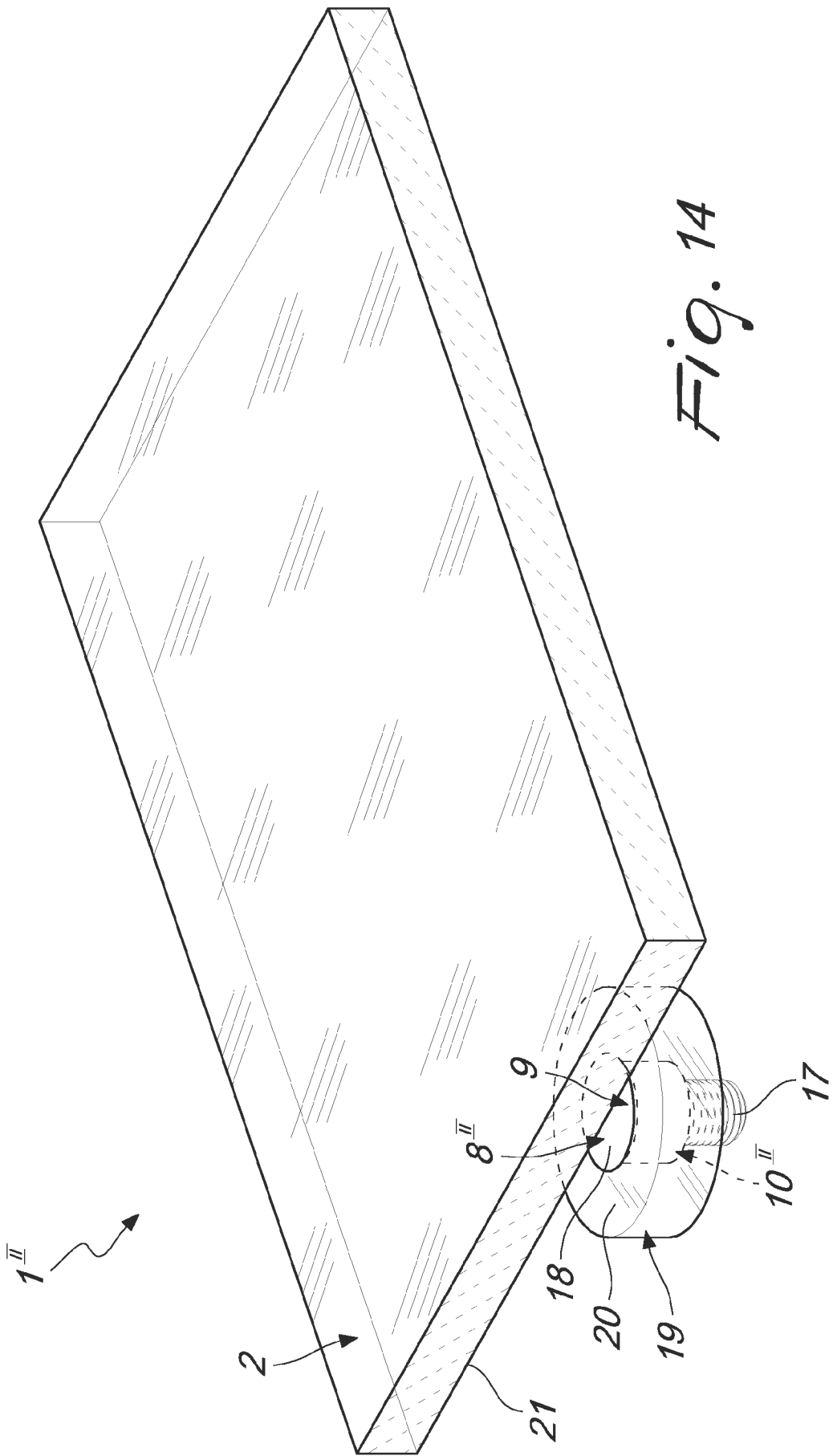
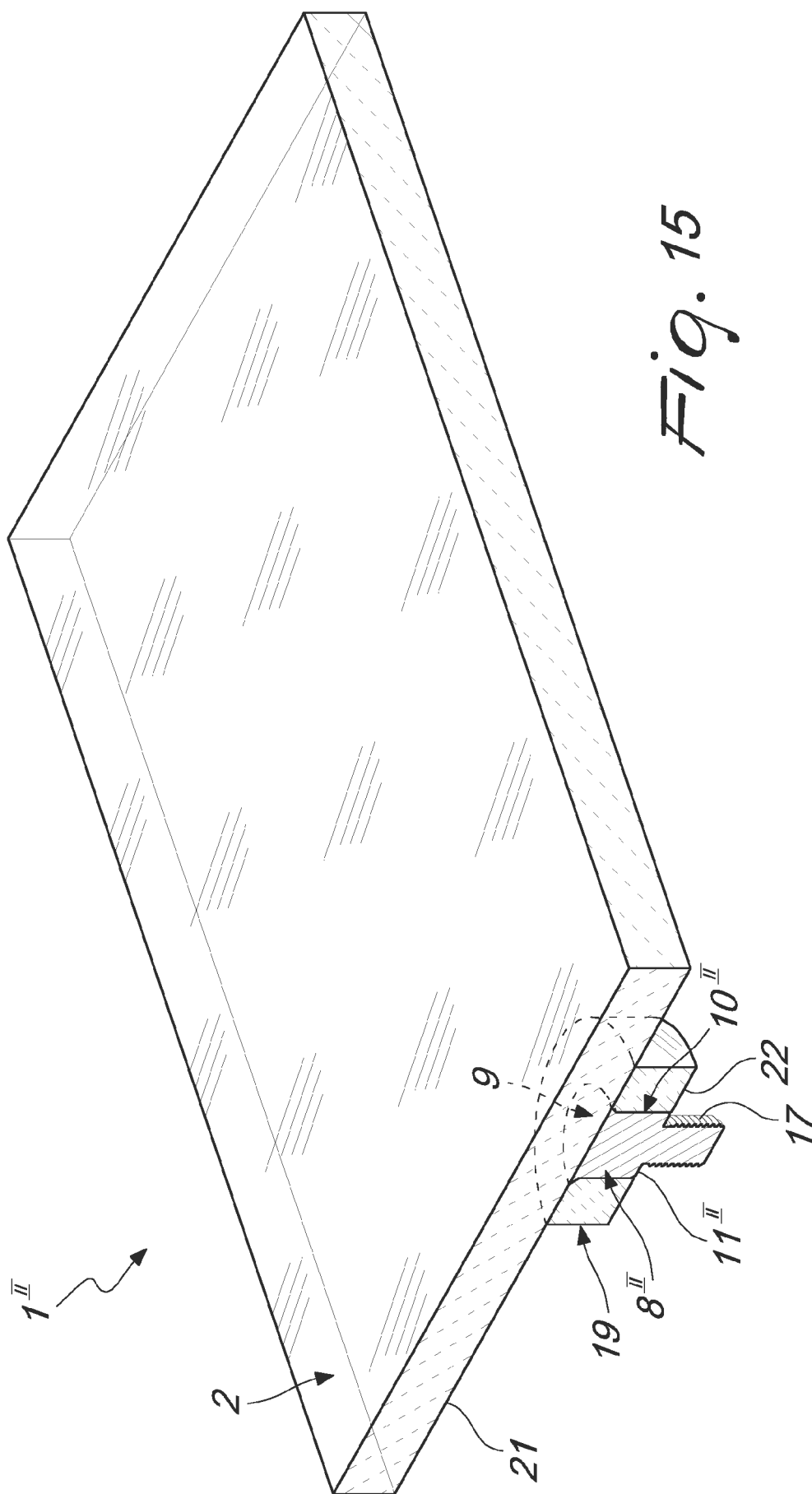
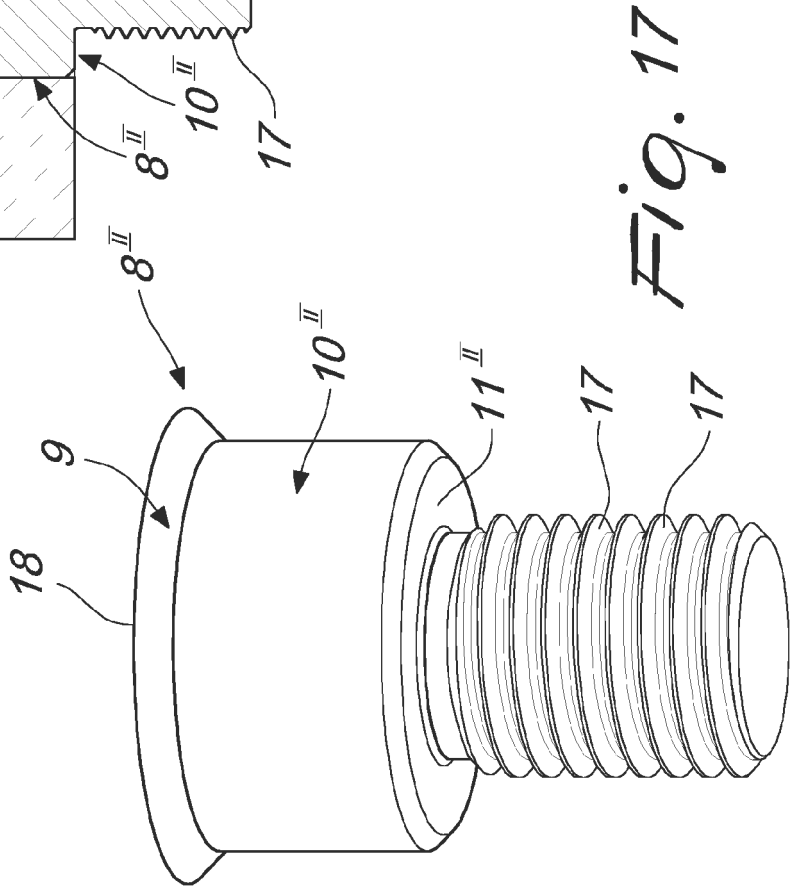
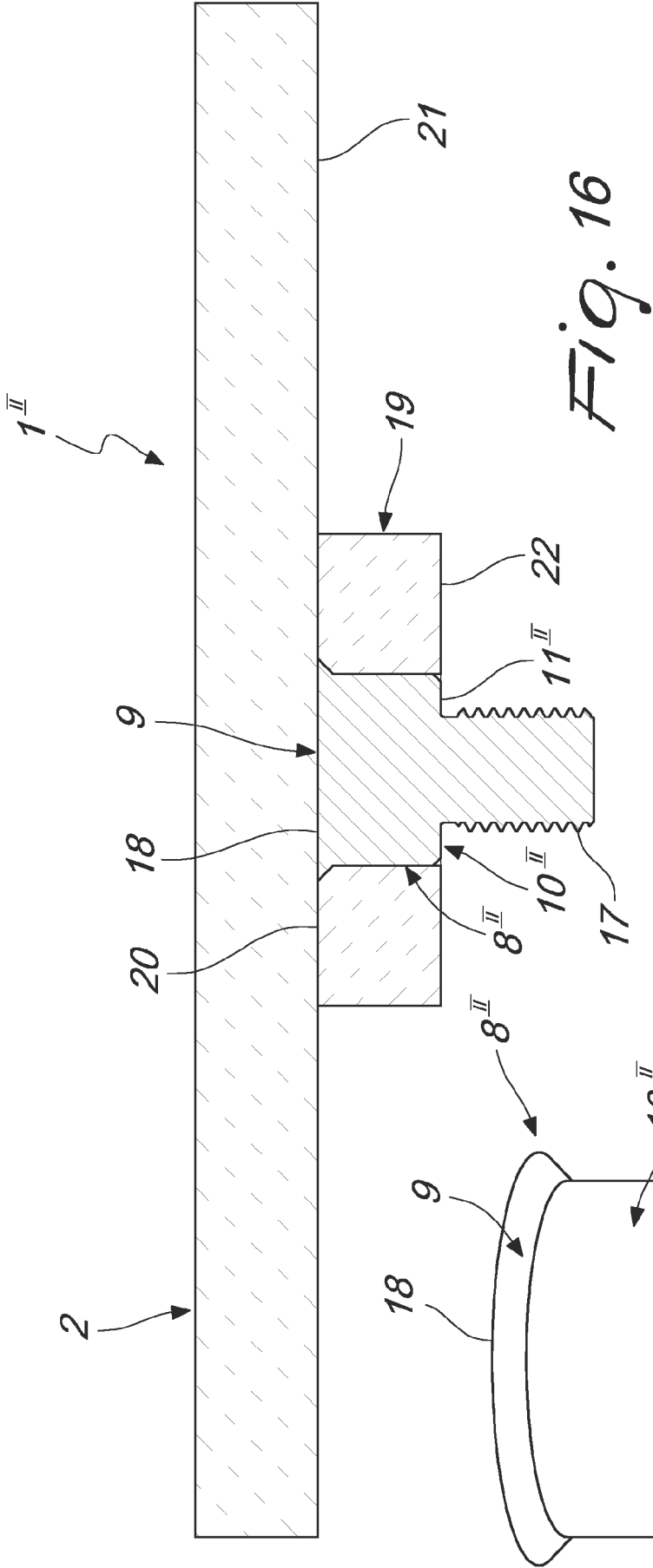
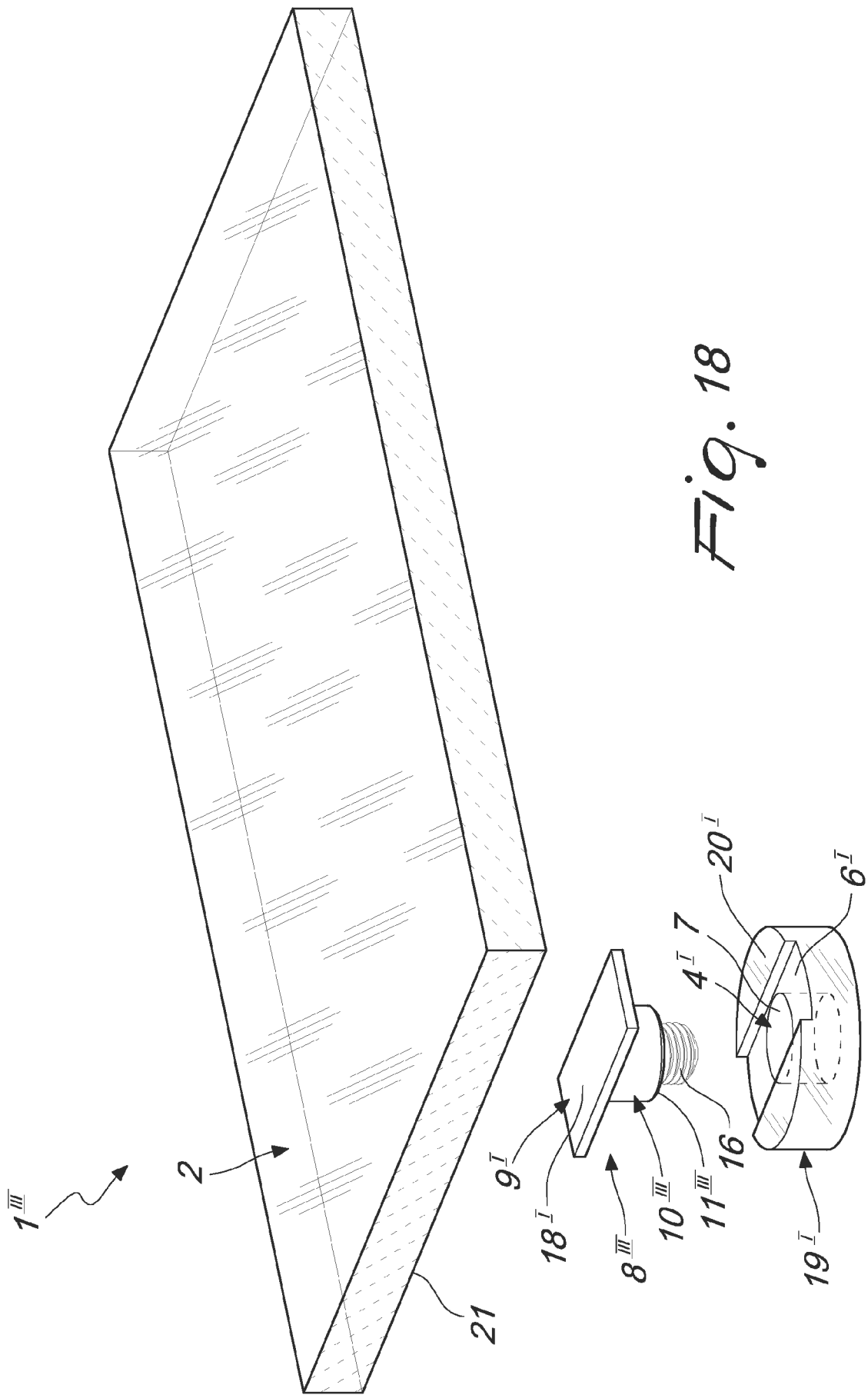
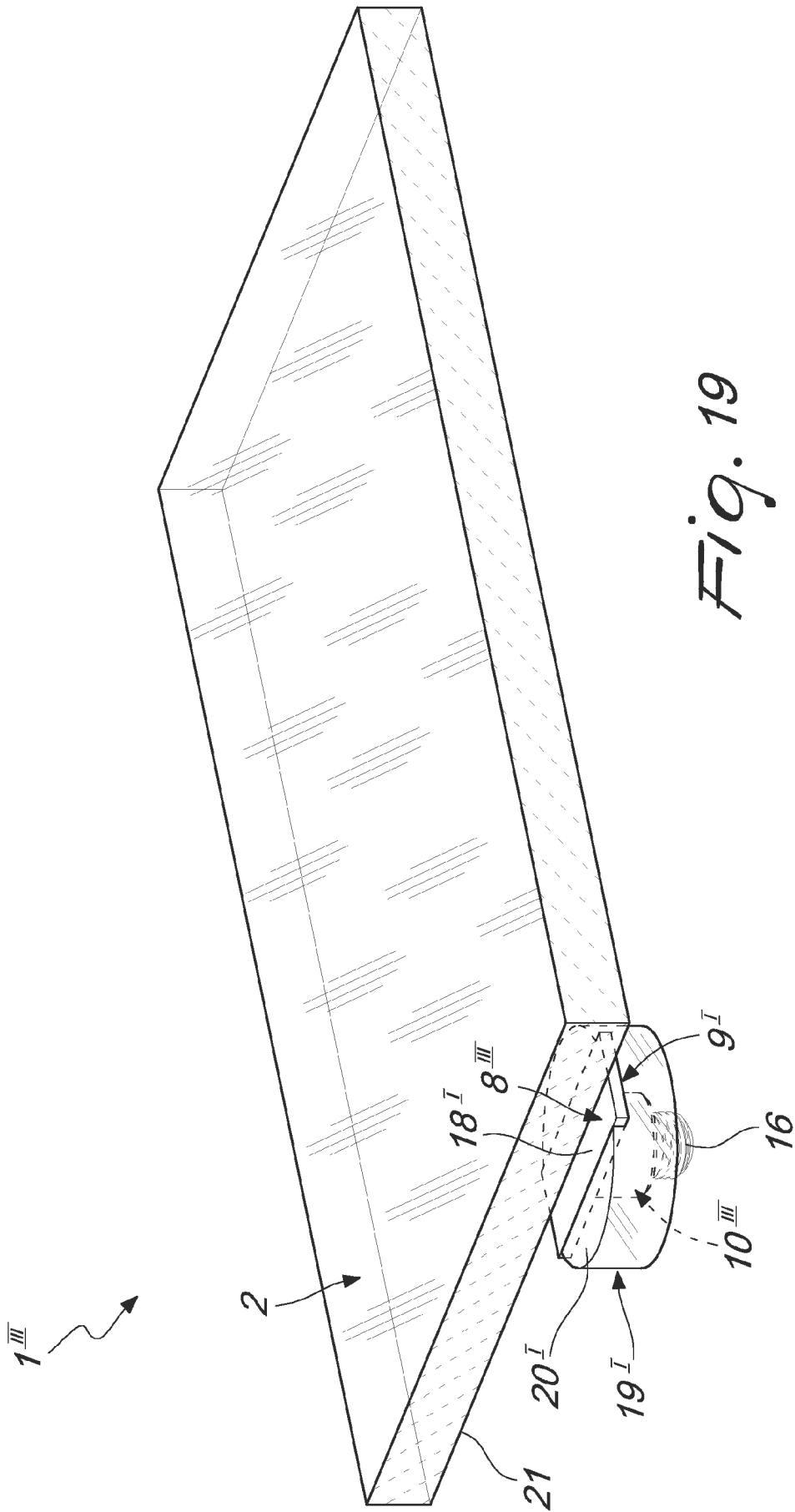


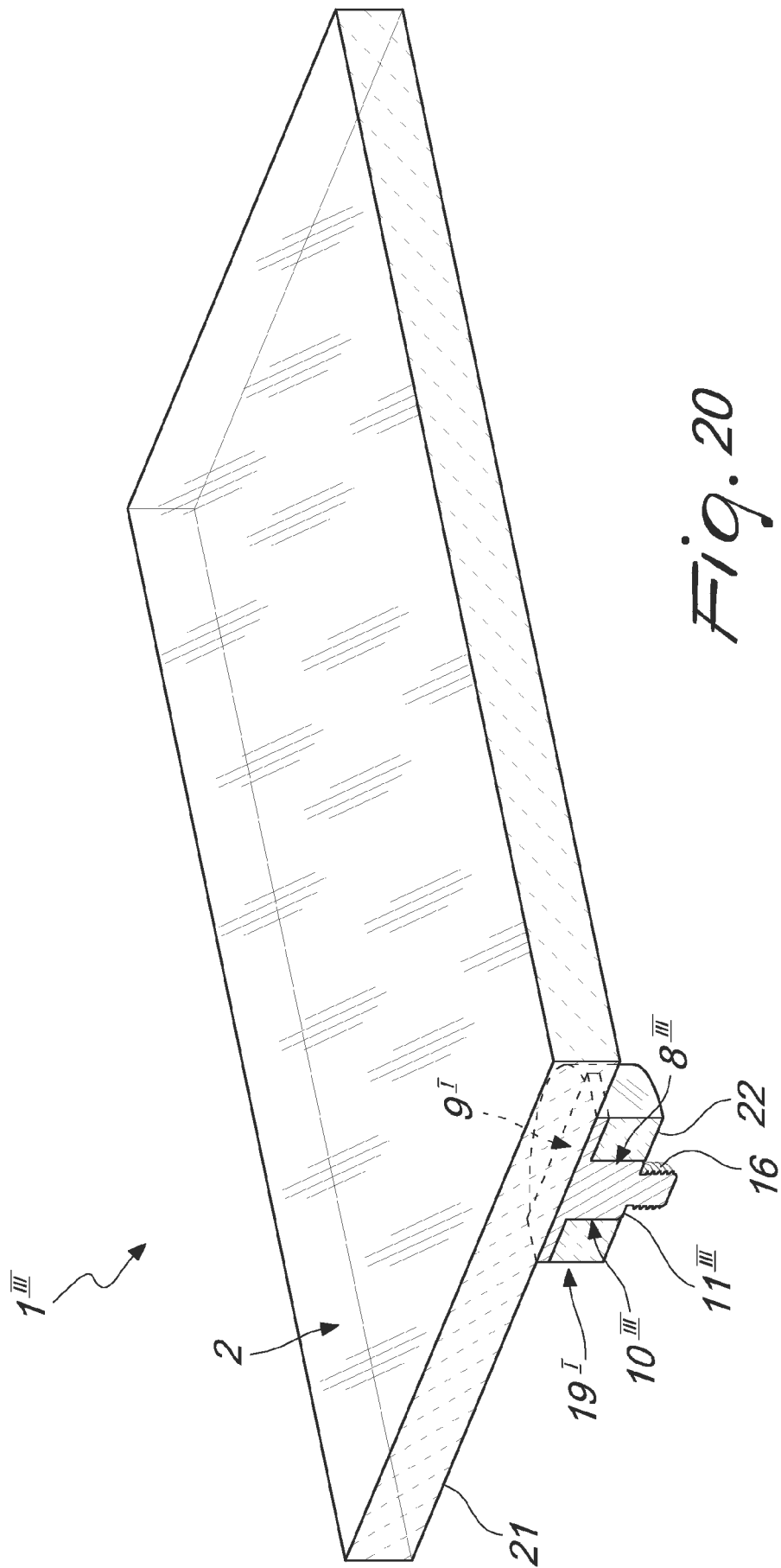
Fig. 14

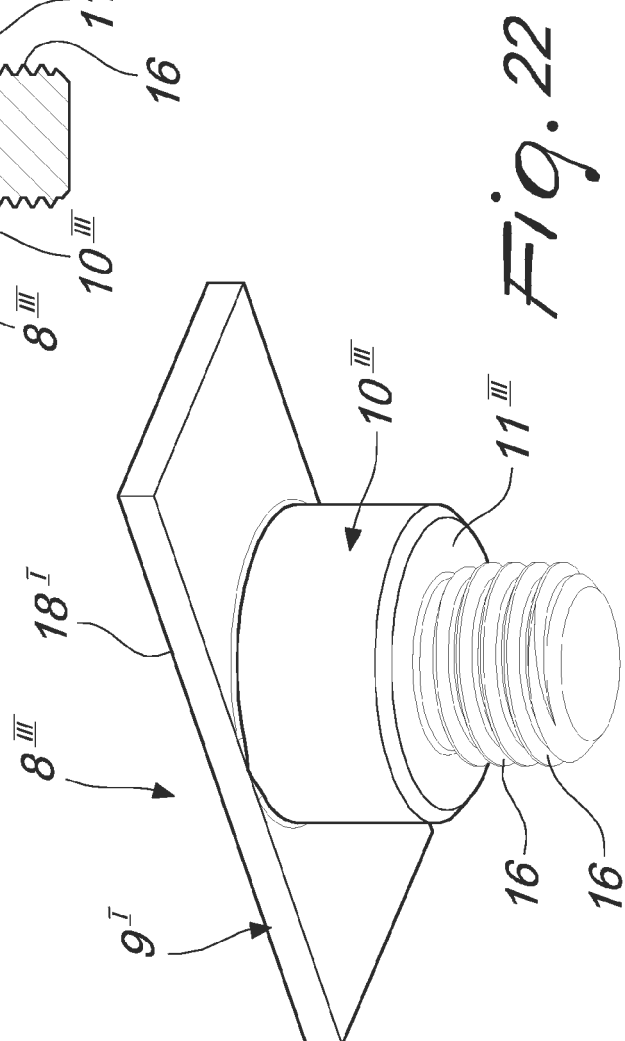
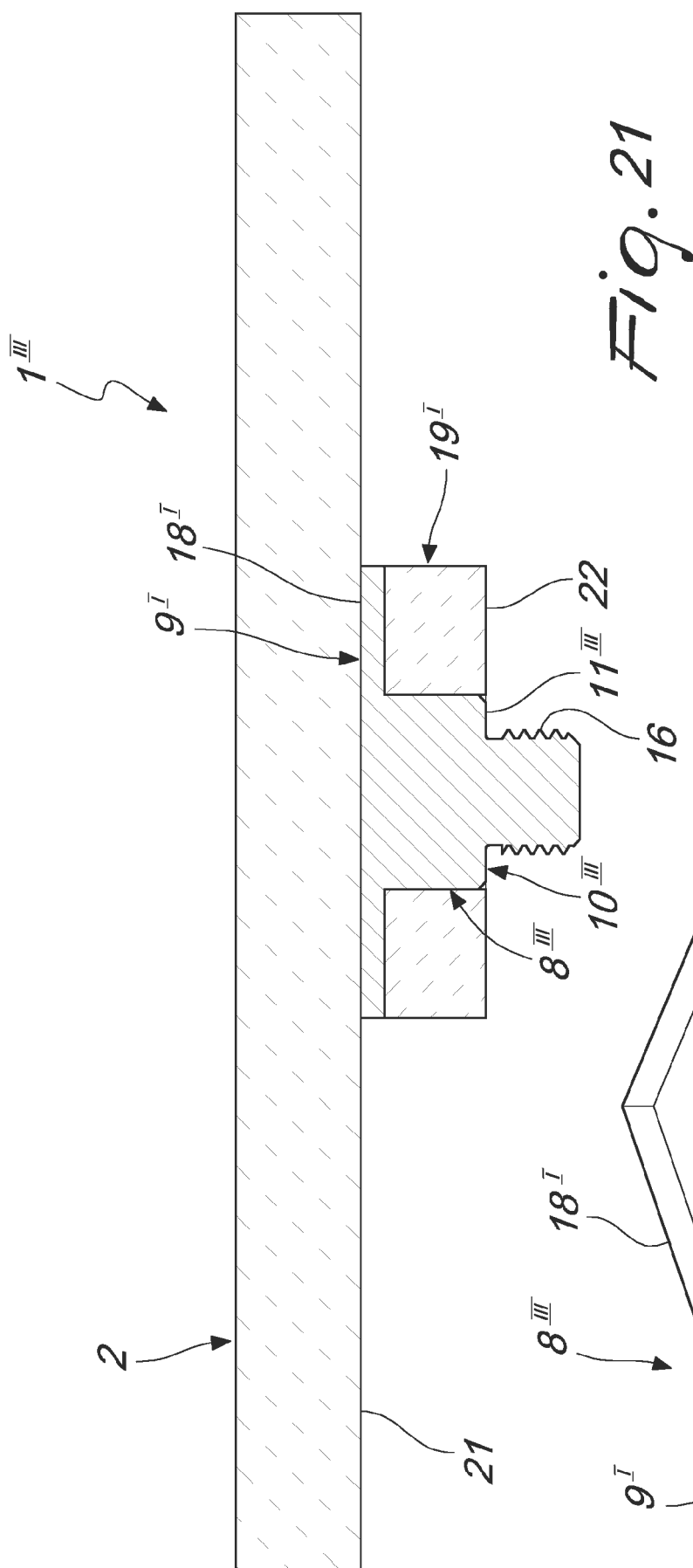














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