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(54) Benævnelse: **Bygningspanel indrettet til at blive monteret ved et loft eller en væg i et rum og fremgangsmåde til fremstilling af et sådant bygningspanel**

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DESCRIPTION

[0001] The present invention relates to a building panel adapted to be mounted at a ceiling or wall of a room so that a framework of the building panel has a room-facing side and a building-facing side, wherein the framework includes a peripheral frame formed by frame profile members, wherein a textile is extended over the room-facing side of the framework between the frame profile members, and wherein each edge of the textile is attached to a corresponding frame profile member by means of a spring-biased tensioning mechanism.

[0002] Such building panels can generally be used to cover interior surfaces in buildings, for instance in auditoriums, open-plan offices, etc. In such fields as architecture and interior design there is often a need for panels for covering of boundaries of a room, such as the ceiling, the walls or partitions placed within the room. Such panels can serve purely aesthetic purposes but can also be used to actively alter a room's characteristics, for instance relating to acoustic and thermal properties of the room.

[0003] WO 2005/073482 A2 discloses a system of building panels for suspended ceilings. Each building panel includes a frame composed by profile members, and a room-facing side of the building panel is formed by a textile suspended between the profile members. Different tensioning systems are disclosed whereby the textile may be stretched evenly over the opening of the frame and thereby form a smooth flat surface visible from the room. However, whereas the building panels disclosed are excellent when a smooth flat textile surface is desired, these building panels are generally not suitable if a curved textile surface is required.

[0004] In the fields of architecture and interior design, building panels having a curved textile surface visible from the room may be required for different reasons, such as for aesthetic or practical purposes. The required dimensions of such building panels may vary greatly.

[0005] The object of the present invention is to provide a building panel suitable for extending smoothly curved textile surfaces of any desired size.

[0006] In view of this object, the peripheral frame is composed by two opposed curved frame profile members and by two opposed straight frame profile members so that the extended textile forms a curved surface, each curved frame profile member is provided with a first spring-biased tensioning mechanism for tensioning the textile and each straight frame profile member is provided with a second spring-biased tensioning mechanism for tensioning the textile, and the first spring-biased tensioning mechanisms are of such a different mechanical construction than the second spring-biased tensioning mechanisms that each first spring-biased tensioning mechanism in the tensioned state of the textile provides a first tensioning force per unit edge length of the textile and each second spring-biased tensioning mechanism is adapted to provide a second maximum tensioning force per unit edge length of the textile, the first tensioning force per unit edge length of the textile being greater than the second maximum tensioning force per unit edge length of the textile.

[0007] In this way, by ensuring said difference between the first and second tensioning forces per unit edge length of the textile, the first spring-biased tensioning mechanisms may extend the textile between the two opposed curved frame profile members by means of a relatively greater force per unit edge length of the textile, thereby ensuring that the textile forms an intended curvature over the entire length of the peripheral frame between the curved frame profile members, and the second spring-biased tensioning mechanisms may by means of a relatively smaller force per unit edge length of the textile ensure that the textile is suitably stretched between the two opposed straight frame profile members without negatively influencing the intended curvature of the textile. Furthermore, as a consequence of said difference between the first and second tensioning forces per unit edge length of the textile, advantageously, the second spring-biased tensioning mechanism may be of a simpler construction and may take up less space in the building panel than the first spring-biased tensioning mechanism.

[0008] In an embodiment, the first tensioning force per unit edge length of the textile is at least two times greater, preferably at least five times greater and most preferred at least ten times greater than the second maximum tensioning force per unit edge length of the textile. Thereby, it may even better be ensured that the textile forms an intended curvature over the entire length of the peripheral frame between the curved frame profile members.

[0009] In a structurally particularly advantageous embodiment, the two opposed curved frame profile members have identical curvatures.

[0010] In an embodiment, in the attached state of an edge of the textile to a corresponding curved frame profile member by means of the first spring-biased tensioning mechanism, the first tensioning force per unit edge length of the textile provided by said first spring-biased tensioning mechanism is adjustable, preferably steplessly. Thereby, by adjustment of the first tensioning force in dependence of the actual curvature of the curved frame profile members, it may even better be ensured that the textile forms an intended curvature over the entire length of the peripheral frame between the curved frame profile members.

[0011] In an embodiment, each first spring-biased tensioning mechanism is arranged at least partly outside the corresponding curved frame profile member, and each second spring-biased tensioning mechanism is arranged inside a channel of the corresponding straight frame profile member. Thereby, the first spring-biased tensioning mechanism may by means of sturdy components suitably be configured to provide a relatively large tensioning force, whereas the second spring-biased tensioning mechanism may by means of smaller components suitably take up relatively little space in the building panel.

[0012] In a structurally particularly advantageous embodiment, each first spring-biased tensioning mechanism includes at least one tension coil spring having a first end attached to a tension profile member forming part of the framework and being spaced from the curved frame profile member and a second end attached to the corresponding edge of the textile.

[0013] In a structurally particularly advantageous embodiment, the first end of said tension coil spring is attached to an adjustment mechanism attached to the tension profile member. Thereby, by adjustment of the first tensioning force in dependence of the actual curvature of the curved frame profile members, it may even better be ensured that the textile forms an intended curvature over the entire length of the peripheral frame between the curved frame profile members.

[0014] In a structurally particularly advantageous embodiment, the first end of said tension coil spring is attached to the eye of an eyebolt inserted through a hole in the tension profile member, and the bolt of the eyebolt is adjustably mounted in the hole of the tension profile member by means of a nut screwed onto the bolt.

[0015] In a structurally particularly advantageous embodiment, the second end of said tension coil spring is attached, preferably by means of a hook member, to an elongated profile attached along the corresponding edge of the textile.

[0016] In an embodiment, each curved frame profile member has a building-facing side and a room-facing side connected by means of a rounded edge about which the textile is bent, and the elongated profile is arranged in a channel in the building-facing side of the curved frame profile member and is preferably attached to the second end of said tension coil spring by means of a hook member extending through an opening in the curved frame profile member. Thereby, the edge of the textile may suitably be attached to the first spring-biased tensioning mechanism at the building-facing side of the curved frame profile member, and at the same time the first spring-biased tensioning mechanism may include a relatively large tension coil spring situated outside the curved frame profile member.

[0017] In an embodiment, each straight frame profile member has a building-facing side and a room-facing side connected by means of a rounded edge about which the textile is bent, each second spring-biased tensioning mechanism includes a bracket arranged in a channel in the building-facing side of the straight frame profile member, and the bracket is spring-biased sideward in the track in order to tension the textile between the opposed rounded edges of the opposed straight frame profile members. Thereby, a suitable maximum tensioning force may be provided by the second spring-biased tensioning mechanism.

[0018] In an embodiment, the distance between the two opposed curved frame profile members is at least 2/3 of, preferably greater than and most preferably at least 4/3 of the distance between the two opposed straight frame profile members. The above-described arrangement of the first and second spring-biased tensioning mechanisms for tensioning the textile is specifically advantageous for panels having the just mentioned distance between the two opposed curved frame profile members, because with such dimensions, by means of already known tensioning systems providing equal tensioning force per unit edge length of the textile in both directions of the textile, it would be very difficult ensuring that the textile forms an intended curvature over the entire length of the peripheral frame between curved frame profile members. Typically, with already known tensioning systems, this would result in the textile

flattening out in a central part of the panel.

[0019] In an embodiment, each curved frame profile member is made from an extruded metal profile, preferably made of aluminium, each curved frame profile member is provided with a number of lateral slits spaced from each other in the longitudinal direction of the curved frame profile member, each lateral slit extends only partly through the extruded metal profile, and each curved frame profile member is strengthened by means of a flat, curved metal plate attached to the extruded metal profile along its length. Thereby, a mass produced extruded profile member may easily be formed to any desired curvature of an actual framework of a building panel. The flat, curved metal plate may easily be cut to the desired curvature, for instance by means of a laser cutter, and may compensate for the flexibility of the extruded profile member provided by the lateral slits. In this way, conveniently, the same type of extruded profile member may be employed for producing both the straight frame profile members and the curved frame profile members.

[0020] The present invention further relates to a method of manufacturing a building panel adapted to be mounted at a ceiling or wall of a room so that a framework of the building panel has a room-facing side and a building-facing side, the framework including a peripheral frame formed by frame profile members, whereby a textile is extended over the room-facing side of the framework between the frame profile members, and whereby each edge of the textile is attached to a corresponding frame profile member by means of a spring-biased tensioning mechanism.

[0021] The method is characterised in that the peripheral frame is composed by two opposed curved frame profile members and by two opposed straight frame profile members in order for the extended textile to form a curved surface, in that, firstly, the textile is tensioned to a first tensioning force per unit edge length of the textile in relation to each curved frame profile member by means of a first spring-biased tensioning mechanism and, secondly, the textile is tensioned to a second tensioning force per unit edge length of the textile in relation to each straight frame profile member by means of a second spring-biased tensioning mechanism, the first tensioning force per unit edge length of the textile being greater than the second tensioning force per unit edge length of the textile.

[0022] In this way, by ensuring said difference between the first and second tensioning forces per unit edge length of the textile, the first spring-biased tensioning mechanisms may extend the textile between the two opposed curved frame profile members by means of a relatively greater force per unit edge length of the textile, thereby ensuring that the textile forms an intended curvature over the entire length of the peripheral frame between the curved frame profile members, and the second spring-biased tensioning mechanisms may by means of a relatively smaller force per unit edge length of the textile ensure that the textile is suitably stretched between the two opposed straight frame profile members without negatively influencing the intended curvature of the textile. By firstly tensioning the textile by means of the relatively greater force by means of the first spring-biased tensioning mechanisms, it may be ensured that the textile forms said intended curvature over the entire length of the peripheral

frame between the curved frame profile members before the textile is attached to the straight frame profile members. Thereby, the length of the textile between the opposed straight frame profile members may be adapted accordingly before attachment by means of the second spring-biased tensioning mechanisms. Therefore, the second spring-biased tensioning mechanisms may not need to be adapted to take up large variations in the length of the textile and may therefore be of a relatively simple construction as compared to the first spring-biased tensioning mechanisms. Furthermore, also as a consequence of said difference between the first and second tensioning forces per unit edge length of the textile, advantageously, the second spring-biased tensioning mechanism may be of a relatively simpler construction and may take up less space in the building panel than the first spring-biased tensioning mechanism.

[0023] In an embodiment, the first tensioning force per unit edge length of the textile is at least two times greater, preferably at least five times greater and most preferred at least ten times greater than the second maximum tensioning force per unit edge length of the textile. Thereby, the above-mentioned features may be obtained.

[0024] In an embodiment, before tensioning the textile in relation to each straight frame profile member by means of the second spring-biased tensioning mechanism, the first tensioning force per unit edge length of the textile provided by the first spring-biased tensioning mechanism is adjusted, preferably steplessly, by means of the first spring-biased tensioning mechanism. Thereby, the above-mentioned features may be obtained.

[0025] In an embodiment, the distance between the two opposed curved frame profile members is at least 2/3 of, preferably greater than and most preferably at least 4/3 of the distance between the two opposed straight frame profile members. Thereby, the above-mentioned features may be obtained.

[0026] The invention will now be explained in more detail below by means of examples of embodiments with reference to the very schematic drawing, in which

Figs. 1 to 7 illustrate perspective views of different stages of the assembly of a framework of a building panel according to the invention;

Fig. 8 illustrates a perspective view of part of a framework of a building panel according to the invention, seen from the room-facing side of the framework, before extension of a textile over the framework;

Fig. 9 illustrates a perspective view of part of the building panel of Fig. 8, seen from the building-facing side of the framework, after extension of a textile over the framework;

Fig. 10 is a side view of part of a first spring-biased tensioning mechanism of the building panel of Fig. 9;

Fig. 11 is a cross-sectional view through part of the building panel of Fig. 9, illustrating the first spring-biased tensioning mechanism of the building panel;

Fig. 12 is a cross-sectional view through a thickened area along an edge of the textile and a corresponding elongated profile adapted to grip over said thickened area;

Fig. 13 illustrates a perspective view of part of the elongated profile of Fig. 12;

Fig. 14 is a cross-sectional view through a straight frame profile member of the building panel of Fig. 9;

Fig. 15 illustrates a perspective, exploded view of part of the straight frame profile member of Fig. 14 and associated fittings; and

Fig. 16 illustrates a perspective cross-sectional view through part of the straight frame profile member of Fig. 14.

Fig. 9 illustrates part of an embodiment of a building panel 1 according to the present invention, adapted to be mounted at a ceiling or wall of a room so that a framework 2 of the building panel has a room-facing side 3 and a building-facing side 4. The framework 2 includes a peripheral frame 5 formed by frame profile members 13, 14, of which only two are visible in the figure. A textile 9 is extended over the room-facing side 3 of the framework 2 between the frame profile members 13, 14, and each edge 18 of the textile 9 is attached to a corresponding frame profile member by means of a spring-biased tensioning mechanism 6, 7. The textile 9 has a first surface 10 facing the framework 2 and a second surface 11 generally visible from said room, as seen in Fig. 11.

[0027] The peripheral frame 5 is composed by two opposed curved frame profile members 13 of which only one in the lower part of Fig. 9 is illustrated and by two opposed straight frame profile members 14 of which only one to the right of the figure is illustrated. It is therefore understood that the part of the building panel 1 illustrated in Fig. 9 forms a (as seen in the figure) lower, right part of the entire building panel 1. Thereby, as illustrated, the extended textile 9 forms a curved surface, which in the illustrated embodiment is concave seen from the room-facing side 3 of the framework 2. In other embodiments, the extended textile 9 may form a curved surface which is convex. Depending on the form of the curved frame profile members 13, the extended textile 9 may form a curved surface which is partly cylindrical, such as a partly circular cylindrical surface.

[0028] Each curved frame profile member 13 is provided with a first spring-biased tensioning mechanism 6 for tensioning the textile 9 as illustrated in more detail in Figs. 9 to 13. Furthermore, each straight frame profile member 14 is provided with a second spring-biased tensioning mechanism 7 for tensioning the textile 9 as illustrated in more detail in Figs. 14 to 16. As it is seen, the first spring-biased tensioning mechanisms 6 are of a different mechanical construction than the second spring-biased tensioning mechanisms 7, whereby each first spring-biased tensioning mechanism 6 is arranged to provide, in the tensioned state of the textile 9, a first tensioning force per unit edge length of the textile 9, and each second spring-

biased tensioning mechanism 7 is adapted to provide a second maximum tensioning force per unit edge length of the textile 9, whereby the first tensioning force per unit edge length of the textile is greater than the second maximum tensioning force per unit edge length of the textile. In this way it is ensured that the textile is extended by a relatively greater force (per unit edge length of the textile) in the direction extending between the two opposed curved frame profile members 13 than in the direction extending between the two opposed straight frame profile member 14. It is noted that the tensioning force per unit edge length of the textile 9 is understood as the total tensioning force applied to the textile over a certain edge 18 of the textile 9 divided by the length of that edge of the textile.

[0029] It is preferred that the first tensioning force per unit edge length of the textile is at least two times greater, preferably at least five times greater and most preferred at least ten times greater than the second maximum tensioning force per unit edge length of the textile. As in the illustrated embodiment, it is preferred that the two opposed curved frame profile members 13 have identical curvatures. It is further preferred, as it will be explained in further detail below, that the first tensioning force per unit edge length of the textile provided by said first spring-biased tensioning mechanism 6 is adjustable, preferably steplessly.

[0030] Comparing on the one hand Figs. 9 and 11 and on the other hand Figs. 14 and 16, it is seen that each first spring-biased tensioning mechanism 6 is arranged at least partly outside the corresponding curved frame profile member 13, and each second spring-biased tensioning mechanism 7 is arranged inside a channel 21 of the corresponding straight frame profile member 14.

[0031] As illustrated in Figs. 9 to 11, each first spring-biased tensioning mechanism 6 includes a number of tension coil springs 12 having a first end 23 attached to a tension profile member 26 forming part of the framework 2 and being spaced from the curved frame profile member 13 and a second end 24 attached to the corresponding edge 18 of the textile 9.

[0032] The first end 23 of said tension coil spring 12 is attached to an adjustment mechanism 27 attached to the tension profile member 26 in the following way: The first end 23 of said tension coil spring 12 is attached to the eye 29 of an eyebolt 28 inserted through a hole 31 in the tension profile member 26, and the bolt 32 of the eyebolt 28 is adjustably mounted in the hole 31 of the tension profile member 26 by means of a nut 33 screwed onto the bolt 32. Of course, the adjustment mechanism 27 may be of any other suitable type known to the skilled person. The second end 24 of said tension coil spring 12 is by means of a hook member 34 attached to an elongated profile 35 attached along the corresponding edge 18 of the textile 9. The elongated profile 35 grips over a thickened area 50 along the edge 18 of the textile 9. The elongated profile 35 has a tubular cross-section 51 with a longitudinally extending slit 52 through which the textile 9 extends, and the elongated profile 35 is attached to the second hook 48 of the hook member 34 in that the second hook 48 is inserted into a hole 53 in the flange 49 of the elongated profile 35. Each elongated profile 35 may be provided with a number of holes 53 each connected with a separate tension coil spring 12. Furthermore, each edge 18 of the textile 9 may be provided with a number of elongated profiles 35 arranged in

continuation of each other and possibly spaced. The thickened area 50 along the edge 18 of the textile 9 is formed by means of a hem 54 with a string 55 or rod inside. The elongated profile 35 is particularly well illustrated in Figs. 12 and 13, and the elongated profile 35 and the thickened area 50 are illustrated in cross-section in Fig. 12.

[0033] As best illustrated in Fig. 11, each curved frame profile member 13 has a building-facing side 17 and a room-facing side 16 connected by means of a rounded edge 15 about which the textile 9 is bent. The elongated profile 35 is arranged in a channel 21 in the building-facing side 17 of the curved frame profile member 13 and is attached to the second end 24 of said tension coil spring 12 by means of the hook member 34 extending through an opening 36 in the curved frame profile member 13; see also Fig. 2.

[0034] As illustrated in Figs. 14 to 16, each straight frame profile member 14 has a rounded outer edge 15 connecting a room-facing side 16 of the straight frame profile member 14 with a building-facing side 17 of the straight frame profile member 14. The textile 9 is bent about the rounded outer edges 15 of the straight frame profile members 14, and an edge 18 of the textile 9 is fixed resiliently by means of at least one spring member 19 to the building-facing side 17 of the straight frame profile members 14. Each edge 18 of the textile 9 is provided with a bracket 20 arranged in a channel 21 in the building-facing side 17 of the corresponding straight frame profile member 14, and the bracket 20 is spring-biased sideward in the channel 21 by means of the least one spring member 19 in order to tension the textile 9 between the opposed rounded outer edges 15 of the respective straight frame profile members 14. The spring member 19 has the form of an elongated flexible hoop. As illustrated in Figs. 14 to 16, the edge 18 of the textile 9 is fixed in a serrated track 30 extending longitudinally in the bracket 20 in that a retaining member 22 in the form of a spring is pressed into the serrated track 30, thereby pinching the textile edge 18 against the serrated walls of the serrated track 30. By this arrangement, as a consequence of the maximum possible pressure force of the spring member 19, it may be ensured that the second spring-biased tensioning mechanism 7 is adapted to provide a second maximum tensioning force per unit edge length of the textile 9.

[0035] It is preferred that the distance between the two opposed curved frame profile members 13 is at least 2/3 of, preferably greater than and most preferably at least 4/3 of the distance between the two opposed straight frame profile members 14. The above-described arrangement of the first and second spring-biased tensioning mechanisms 6, 7 for tensioning the textile 9 is specifically advantageous for panels having the just mentioned distance between the two opposed curved frame profile members 13, because with such dimensions, by means of already known tensioning systems providing equal tensioning force per unit edge length of the textile in both directions of the textile, it would be very difficult ensuring that the textile forms an intended curvature over the entire length of the peripheral frame between curved frame profile members. Typically, with already known tensioning systems, this would result in the textile flattening out in a central part of the panel.

[0036] Preferably, each curved frame profile member 13 is made from an extruded metal profile 37, preferably made of aluminium, and each curved frame profile member 13 is

provided with a number of lateral slits 38 spaced from each other in the longitudinal direction of the curved frame profile member 13, whereby each lateral slit 38 extends only partly through the extruded metal profile 37. Thereby, by providing flexibility to the extruded metal profile 37 by means of the lateral slits 38, a mass produced extruded profile member may easily be formed to any desired curvature of an actual framework of a building panel. Subsequently to the bending of the extruded metal profile 37 provided with lateral slits 38 into a desired curvature, the flexible extruded metal profile 37 is strengthened by means of a flat, curved metal plate 39 attached to the extruded metal profile 37 along its length. The curved metal plate 39 may be attached to the extruded metal profile 37 for instance by means of rivets 56 or any other suitable fastening devices or methods, such as welding. Thereby a stiff, curved frame profile member 13 suitable for the framework 2 may be obtained from a mass produced extruded profile member. The flat, curved metal plate 39 may easily be cut to the desired curvature, for instance by means of a laser cutter, and may compensate for the flexibility of the extruded metal profile 37 provided by the lateral slits. In this way, conveniently, the same type of extruded profile member may be employed for producing both the straight frame profile members 14 and the curved frame profile members 13.

[0037] Comparing Figs. 11 and 16, it is seen that in the illustrated embodiment, the same type of extruded profile member has been employed for producing both the straight frame profile members 14 and the curved frame profile members 13. It is noted that therefore, for both the straight frame profile members 14 and the curved frame profile members 13, the rounded edge 15 connecting the room-facing side 16 of the frame profile members 13, 14 with the building-facing side 17 of the frame profile members 13, 14 is arranged at the outer edge of an in the figures obliquely downward extending flange portion of the frame profile members 13, 14. Thereby, it may be ensured that the part of the textile 9 visible from the room only touches the framework 2 at the rounded edges 15 of the frame profile members 13, 14. Consequently, a very smooth curved visible textile surface may be obtained.

[0038] In order to manufacture a building panel 1 according to the present invention, the framework 2 as partly illustrated in Fig. 8 is assembled from the peripheral frame 5 formed by the four frame profile members 13, 14 described above, as well as two tension profile members 26 of which one is seen in the figure, a number of curved framework profile members 42, and a number of straight framework profile members 43. Each tension profile member 26 is arranged parallelly to and at a distance from a curved frame profile member 13 in order to support the first spring-biased tensioning mechanism 6. The curved framework profile members 42 are arranged parallelly to and at a distance from a tension profile member 26 in order to support the framework 2 and possibly support a number of insulation mats 8. The straight framework profile member or members 43 is/are arranged parallelly to and at a distance from the straight frame profile members 14 in order to support the framework 2 and possibly support a number of insulation mats 8.

[0039] Subsequently to the assembly of the framework 2, a textile 9 is extended over the room-facing side 3 of the framework 2 between the frame profile members 13, 14, whereby each edge 18 of the textile 9 is attached to a corresponding frame profile member by means of

a spring-biased tensioning mechanism 6, 7. Thereby, the extended textile 9 may form a curved surface 10, 11.

[0040] Then, firstly, the textile 9 is tensioned to a first tensioning force per unit edge length of the textile in relation to each curved frame profile member 13 by means of the first spring-biased tensioning mechanism 6 and, secondly, the textile 9 is tensioned to a second tensioning force per unit edge length of the textile in relation to each straight frame profile member 14 by means of the second spring-biased tensioning mechanism 7, whereby the first tensioning force per unit edge length of the textile is greater than the second tensioning force per unit edge length of the textile.

[0041] Preferably, before tensioning the textile 9 in relation to each straight frame profile member 14 by means of the second spring-biased tensioning mechanism 7, the first tensioning force per unit edge length of the textile provided by the first spring-biased tensioning mechanism 6 is adjusted, preferably steplessly, by means of the first spring-biased tensioning mechanism 6.

[0042] The textile 9 may be a non-woven or woven fabric in the form of a flexible material formed by natural or artificial fibres, yarn or thread. The textile 9 is preferably of a material or structure that allows air to diffuse through it.

List of reference numbers

[0043]

1 building panel
2 framework
3 room-facing side of framework
4 building-facing side of framework
5 peripheral frame
6 first spring-biased tensioning mechanism
7 second spring-biased tensioning mechanism
8 insulation mat
9 textile

10 first surface of textile

11 second surface of textile

12 tension coil spring

13 curved frame profile member

14 straight frame profile member

15 rounded outer edge of profile member

16 room-facing side of profile member

17 building-facing side of profile member

18 edge of textile

19 spring member

20 bracket

21 channel of frame profile member

22 retaining member

23 first end of tension coil spring

24 second end of tension coil spring

25 mounting track of profile member

26 tension profile member

27 adjustment mechanism

28 eyebolt

29 eye of eyebolt

30 serrated track of bracket

31 hole in tension profile member

32 bolt of eyebolt

33 nut

34 hook member

35 elongated profile

36 opening in curved frame profile member

37 extruded metal profile of curved frame profile member

38 lateral slit of extruded metal profile of curved frame profile member

39 curved metal plate of curved frame profile member

40 body of tension profile member

41 flange of tension profile member

42 curved framework profile member

43 straight framework profile member

44 partly throughgoing slit of insulation mat

45 curved metal plate of tension profile member

46 slit of tension profile member

47 first hook of hook member

48 second hook of hook member

49 flange of elongated profile

50 thickened area along edge of textile

51 tubular cross-section of elongated profile

52 longitudinally extending slit tubular cross-section of elongated profile

53 hole in flange of elongated profile

54
hem
55
string or rod
56
rivet

REFERENCES CITED IN THE DESCRIPTION

Cited references

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Patent documents cited in the description

- WO2005073462A2 [0003]

Bygningspanel indrettet til at blive monteret ved et loft eller en væg i et rum og fremgangsmåde til fremstilling af et sådant bygningspanel

Patentkrav

1. Bygningspanel (1) indrettet til at blive monteret ved et loft eller en væg i et rum, således at en rammekonstruktion (2) af bygningspanelet har en mod rummet vendende side (3) og en mod bygningen vendende side (4), hvor rammekonstruktionen (2) omfatter en perifer ramme (5) dannet af rammeprofilelementer (13, 14), hvor et tekstil (9) er udspændt over den mod rummet vendende side (3) af rammekonstruktionen (2) mellem rammeprofilelementerne (13, 14), og hvor hver kant (18) af tekstilet (9) er fastgjort til et tilsvarende rammeprofilelement ved hjælp af en fjederforspændt spændingsmekanisme (6, 7), **kendetegnet ved, at** den perifere ramme (5) er sammensat af to modsat beliggende krumme rammeprofilelementer (13) og af to modsat beliggende lige rammeprofilelementer (14), således at det udspændte tekstil (9) danner en krum flade (10, 11), ved, at hvert krumt rammeprofilelement (13) er forsynet med en første fjederforspændt spændingsmekanisme (6) til spænding af tekstilet (9), og hvert lige rammeprofilelement (14) er forsynet med en anden fjederforspændt spændingsmekanisme (7) til spænding af tekstilet (9), og ved, at de første fjederforspændte spændingsmekanismer (6) er af en sådan anderledes mekanisk konstruktion end de andre fjederforspændte spændingsmekanismer (7), at hver første fjederforspændte spændingsmekanisme (6) i den spændte tilstand af tekstilet (9) tilvejebringer en første spændkraft per enhedskantlængde af tekstilet, og hver anden fjederforspændte spændingsmekanisme (7) er indrettet til at tilvejebringe en anden maksimal spændkraft per enhedskantlængde af tekstilet, idet den første spændkraft per enhedskantlængde af tekstilet er større end den anden maksimale spændkraft per enhedskantlængde af tekstilet.

2. Bygningspanel ifølge krav 1, hvor den første spændkraft per enhedskantlængde af tekstilet er mindst to gange større, fortrinsvis mindst fem gange større og mest foretrukket mindst ti gange større end den anden maksimale spændkraft per enhedskantlængde af tekstilet.

3. Bygningspanel ifølge krav 1 eller 2, hvor de to modsat beliggende krumme rammeprofilelementer (13) har identiske krumninger.

4. Bygningspanel ifølge et af de foregående krav, hvor, i den fastgjorte tilstand af en kant (18) af tekstilet (9) til et tilsvarende krumt rammeprofilelement (13) ved hjælp af den første fjederforspændte spændingsmekanisme (6), den første spændkraft per enhedskantlængde af tekstilet tilvejebragt af den første fjederforspændte spændingsmekanisme (6) er justerbar, fortrinsvis trinløst.

5. Bygningspanel ifølge et af de foregående krav, hvor hver første fjederforspændte spændingsmekanisme (6) er anbragt i det mindste delvist uden for det tilsvarende krumme rammeprofilelement (13), og hvor hver anden fjederforspændte spændingsmekanisme (7) er anbragt inden i en kanal (21) af det tilsvarende lige rammeprofilelement (14).

6. Bygningspanel ifølge et af de foregående krav, hvor hver første fjederforspændte spændingsmekanisme (6) omfatter mindst en spændingsspiralfjeder (12) med en første ende (23) fastgjort til et spændingsprofilelement (26), der danner en del af rammekonstruktionen (2) og er anbragt i afstand fra det krumme rammeprofilelement (13), og en anden ende (24) fastgjort til den tilsvarende kant (18) af tekstilet (9).

7. Bygningspanel ifølge krav 6, hvor den første ende (23) af spændingsspiralfjederen (12) er fastgjort til en justeringsmekanisme (27) fastgjort til spændingsprofilelementet (26).

8. Bygningspanel ifølge krav 6 eller 7, hvor den første ende (23) af spændingsspiralfjederen (12) er fastgjort til øjet (29) af en øjebolt (28) indført gennem et hul (31) i spændingsprofilelementet (26), og hvor bolten (32) af øjebolten (28) er justerbart monteret i hullet (31) i spændingsprofilelementet (26) ved hjælp af en møtrik (33), som er skruet på bolten (32).

9. Bygningspanel ifølge et af kravene 6 til 8, hvor den anden ende (24) af spændingsspiralfjederen (12) er fastgjort, fortrinsvis ved hjælp af et krogelement (34), til et aflangt profil (35) fastgjort langs den tilsvarende kant (18) af

tekstilet (9).

10. Bygningspanel ifølge krav 9, hvor hvert krumt rammeprofilelement (13) har en mod bygningen vendende side (17) og en mod rummet vendende side (16) forbundet ved hjælp af en afrundet kant (15), som tekstilet (9) er bøjet omkring, og hvor det aflange profil (35) er anbragt i en kanal (21) i den mod bygningen vendende side (17) af det krumme rammeprofilelement (13) og fortrinsvis er fastgjort til den anden ende (24) af spændingsspiralfjederen (12) ved hjælp af et krogelement (34), der strækker sig gennem en åbning (36) i det krumme rammeprofilelement (13).

11. Bygningspanel ifølge et af de foregående krav, hvor hvert lige rammeprofilelement (14) har en mod bygningen vendende side (17) og en mod rummet vendende side (16) forbundet ved hjælp af en afrundet kant (15), som tekstilet (9) er bøjet omkring, hvor hver anden fjederforspændt spændingsmekanisme (7) omfatter et beslag (20) anbragt i en kanal (21) i den mod bygningen vendende side (17) af det lige rammeprofilelement (14), og hvor beslaget (20) er fjederforspændt sidelæns i sporet (21) for at spænde tekstilet (9) mellem de modsat beliggende afrundede kanter (15) af de modsat beliggende lige rammeprofilelementer (14).

12. Bygningspanel ifølge et af de foregående krav, hvor afstanden mellem de to modsat beliggende krumme rammeprofilelementer (13) er mindst 2/3 af, fortrinsvis større end og mest fortrinsvis mindst 4/3 af afstanden mellem de to modsat beliggende lige rammeprofilelementer (14).

13. Bygningspanel ifølge et af de foregående krav, hvor hvert krumt rammeprofilelement (13) er lavet af et ekstruderet metalprofil (37), fortrinsvis lavet af aluminium, hvor hvert krumt rammeprofilelement (13) er forsynet med et antal laterale slidser (38) anbragt med afstand fra hinanden i længderetningen af det krumme rammeprofilelement (13), hvor hver laterale slids (38) kun strækker sig delvist gennem det ekstruderede metalprofil (37), og hvor hvert krumme rammeprofilelement (13) er forstærket ved hjælp af en flad, krum metalplade (39), der er fastgjort til det ekstruderede metalprofil (37) langs dets længde.

14. Fremgangsmåde til at fremstille et bygningspanel indrettet til at blive monteret ved et loft eller en væg i et rum, således at en rammekonstruktion (2) af bygningspanelet har en mod rummet vendende side (3) og en mod bygningen vendende side (4), hvilken rammekonstruktion (2) omfatter en perifer ramme (5) dannet af rammeprofilelementer (13, 14), hvorved et tekstil (9) udspændes over den mod rummet vendende side (3) af rammen (2) mellem rammeprofilelementerne (13, 14), og hvorved hver kant (18) af tekstilet (9) fastgøres til et tilsvarende rammeprofilelement ved hjælp af en fjederforspændt spændingsmekanisme (6, 7), **kendetegnet ved, at** den perifere ramme (5) sammensættes af to modsat beliggende krumme rammeprofilelementer (13) og af to modsat beliggende lige rammeprofilelementer (14) for at det udspændte tekstil (9) kan danne en krum flade (10, 11), ved, at tekstilet (9) for det første er spændt til en første spændkraft per enhedskantlængde af tekstilet i forhold til hvert krumt rammeprofilelement (13) ved hjælp af en første fjederforspændt spændingsmekanisme (6), og tekstilet (9) for det andet er spændt til en anden spændkraft per enhedskantlængde af tekstilet i forhold til hvert lige rammeprofilelement (14) ved hjælp af en anden fjederforspændt spændingsmekanisme (7), idet den første spændkraft per enhedskantlængde af tekstilet er større end den anden spændkraft per enhedskantlængde af tekstilet.

15. Fremgangsmåde til at fremstille et bygningspanel ifølge krav 14, hvor den første spændkraft per enhedskantlængde af tekstilet er mindst to gange større, fortrinsvis mindst fem gange større og mest fortrinsvis mindst ti gange større end den anden maksimale spændkraft per enhedskantlængde af tekstilet.

16. Fremgangsmåde til at fremstille et bygningspanel ifølge krav 14 eller 15, hvorved, før spænding af tekstilet (9) i forhold til hvert lige rammeprofilelement (14) ved hjælp af den anden fjederforspændte spændingsmekanisme (7), den første spændkraft per enhedskantlængde af tekstilet tilvejebragt af den første fjederforspændte spændingsmekanisme (6) justeres, fortrinsvis trinløst, ved hjælp af den første fjederforspændte spændingsmekanisme (6).

17. Fremgangsmåde til at fremstille et bygningspanel ifølge et af kravene 14 til 16, hvor afstanden mellem de to modsat beliggende krumme rammeprofilelementer (13) er mindst 2/3 af, fortrinsvis større end og mest foretrukket

mindst 4/3 af afstanden mellem de to modsat beliggende lige rammeprofilelementer (14).

DRAWINGS

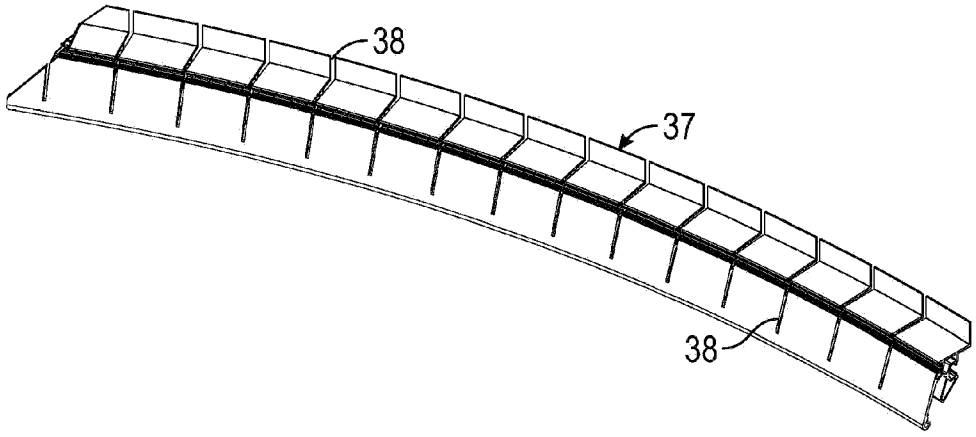


FIG. 1

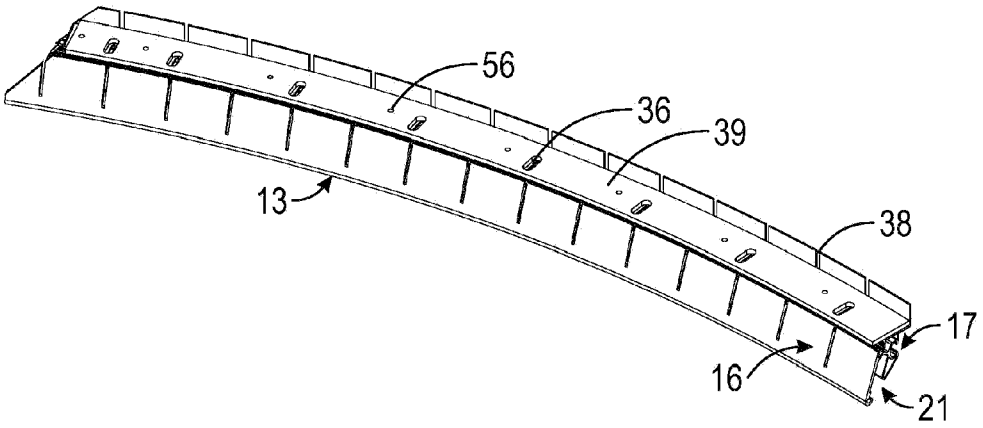


FIG. 2

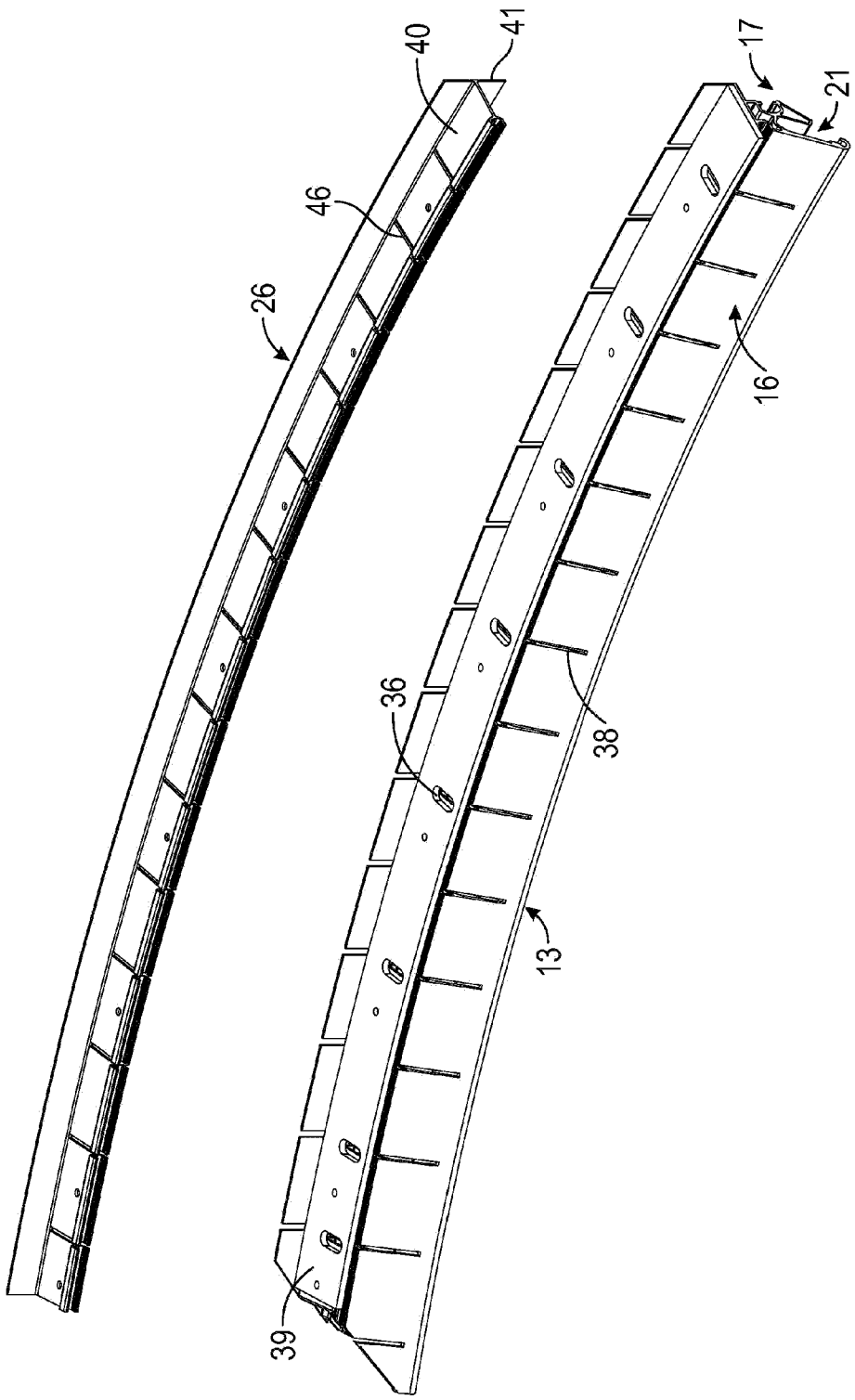
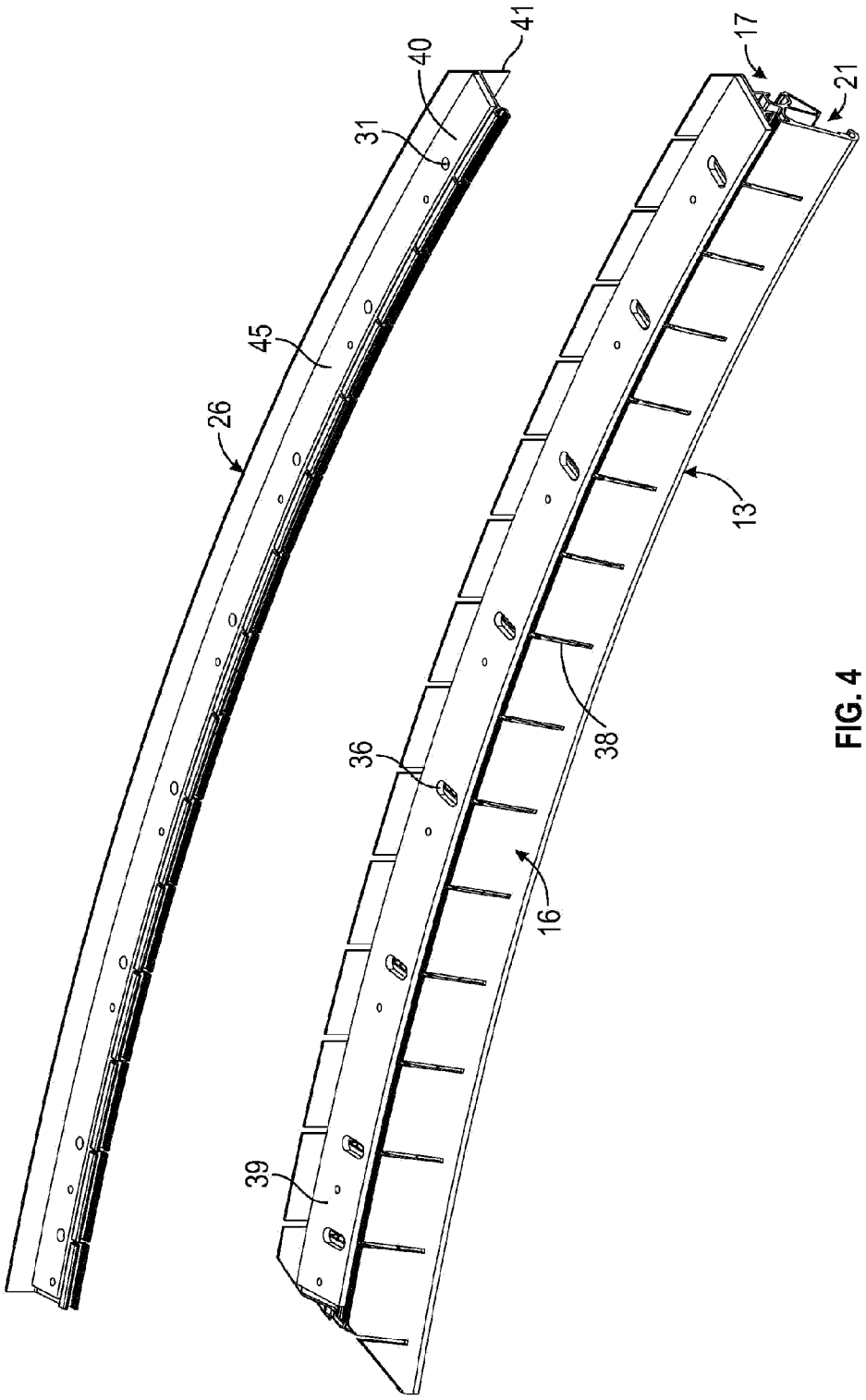


FIG. 3



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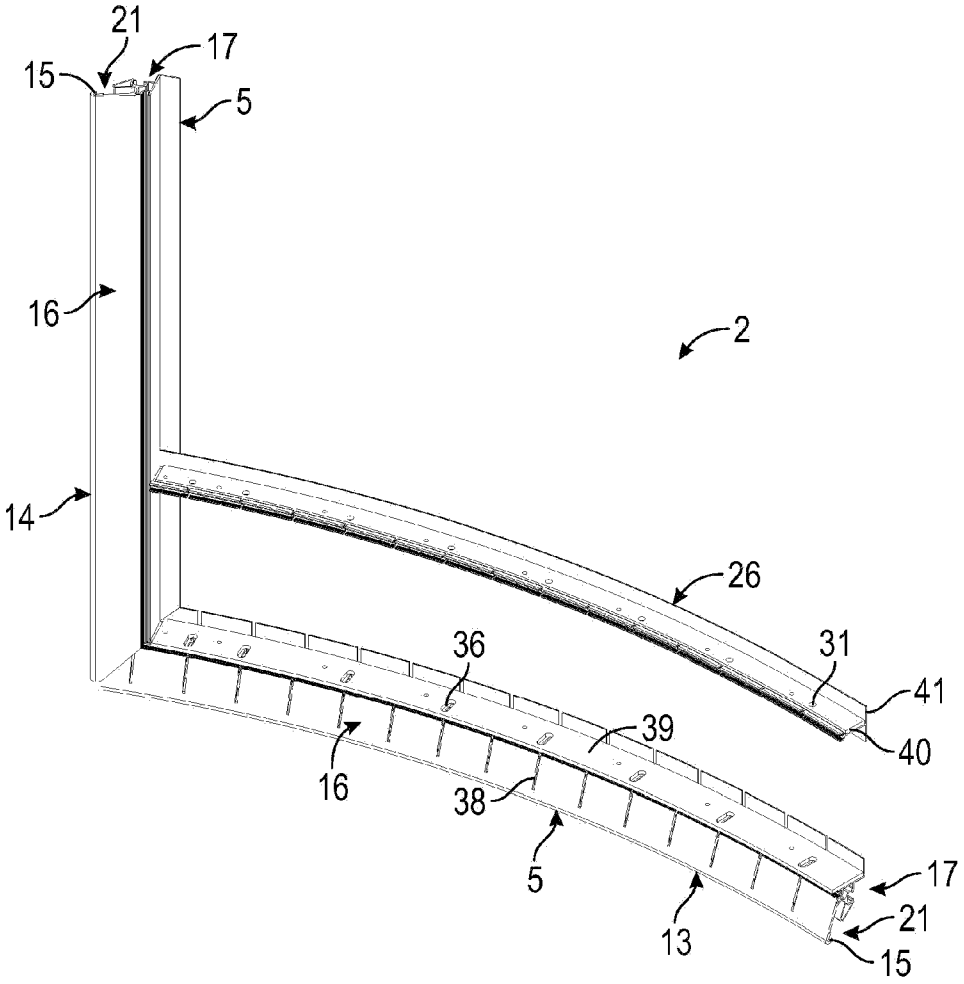

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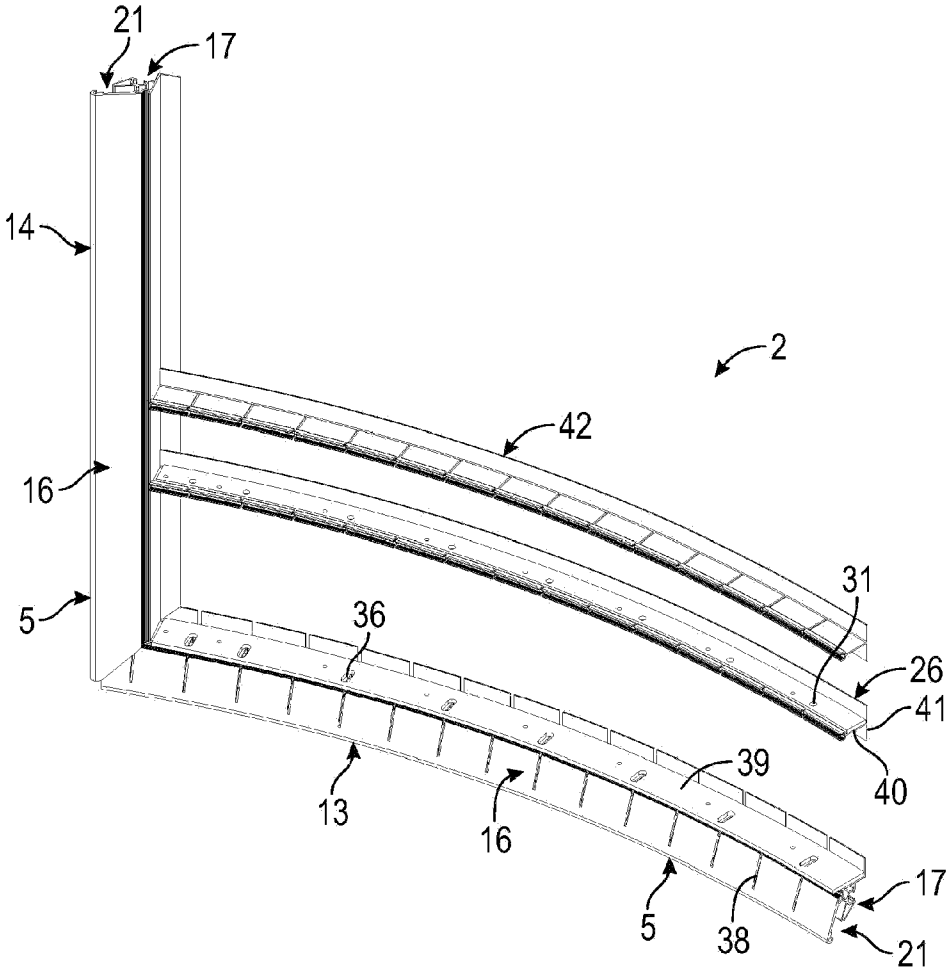

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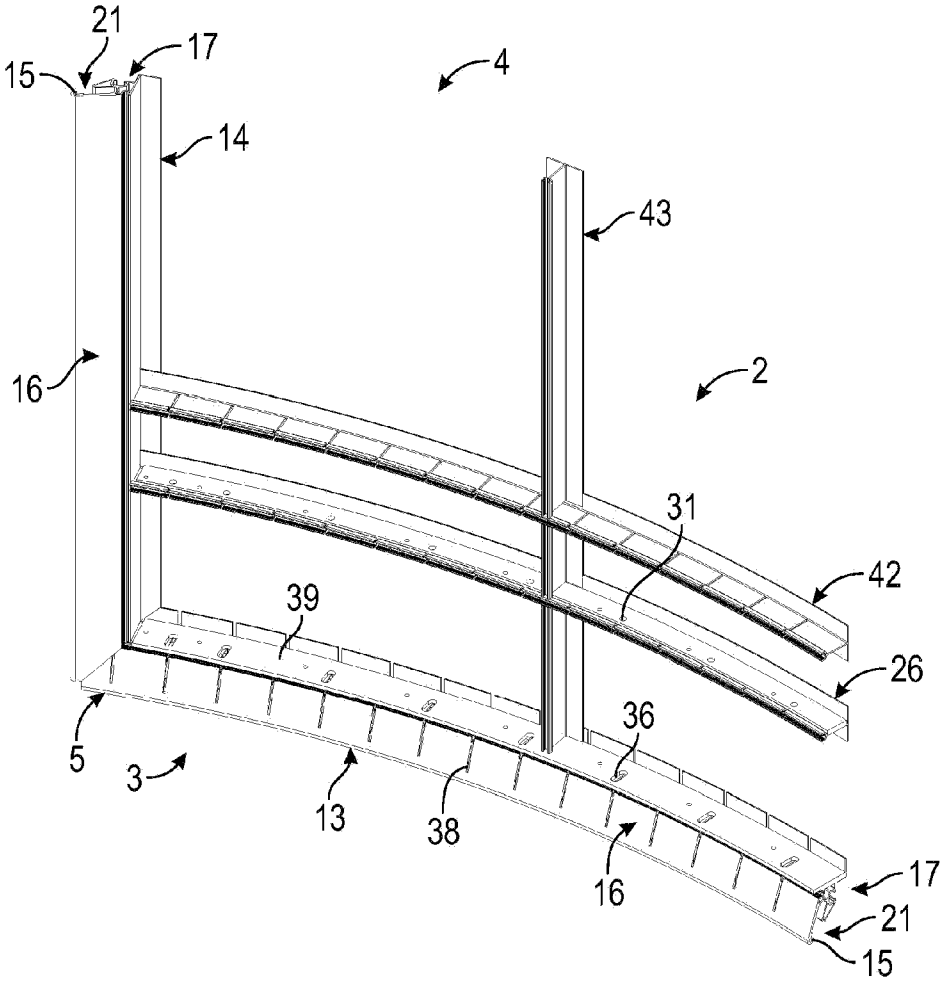

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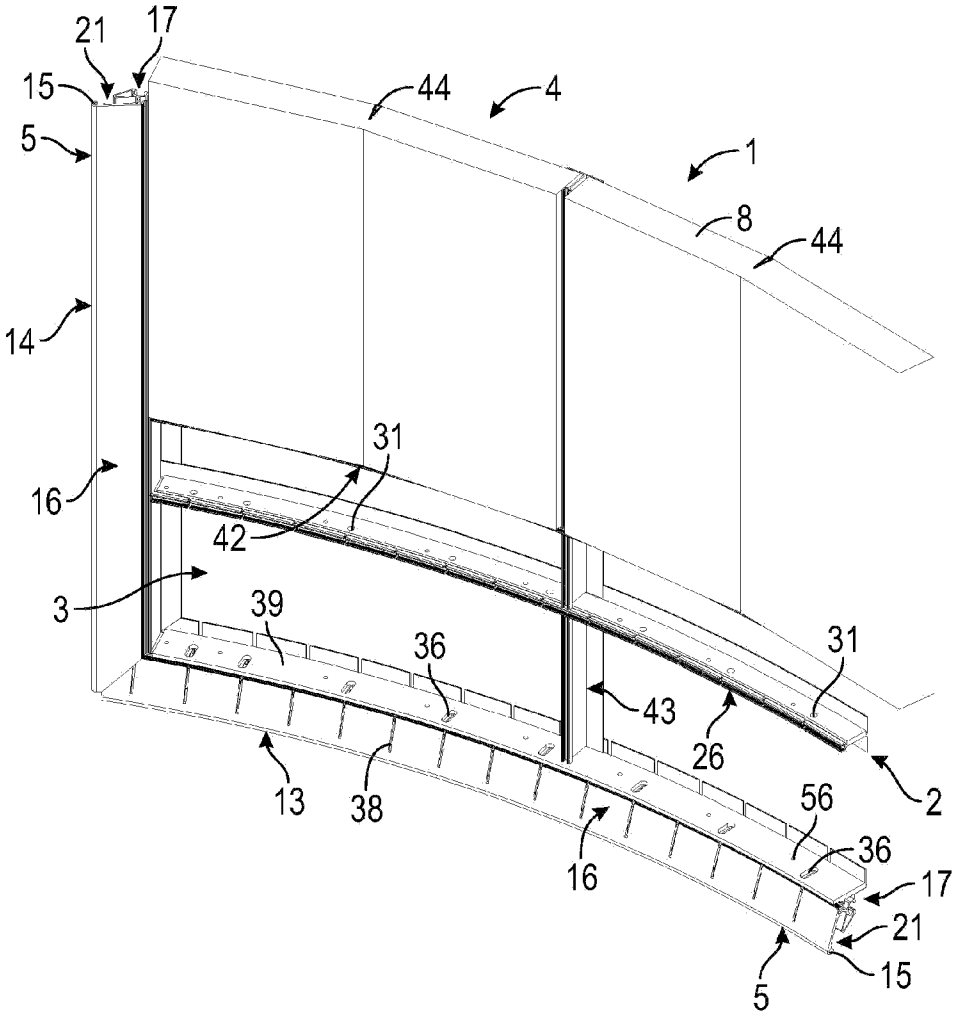
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FIG. 8

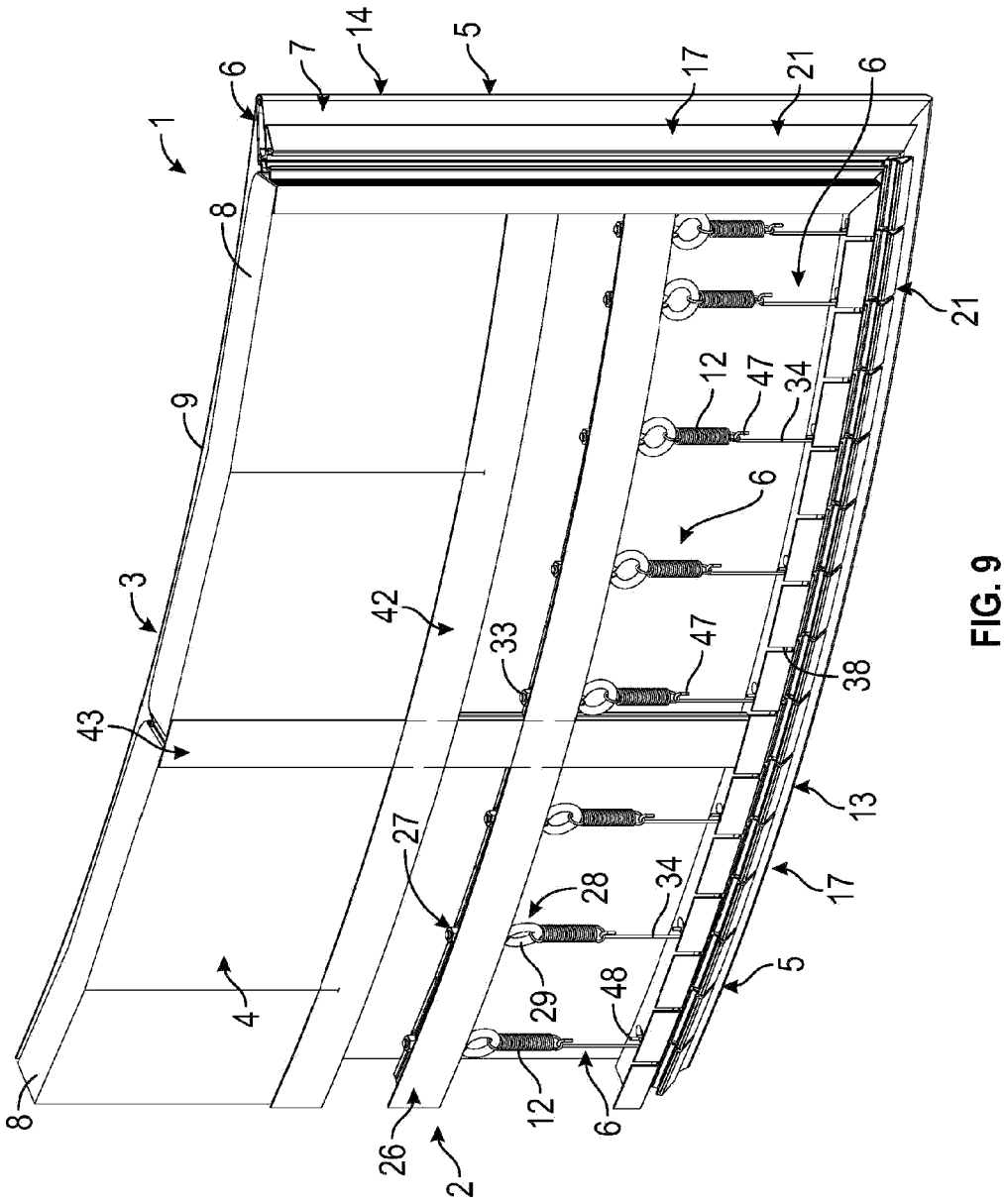
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FIG. 9

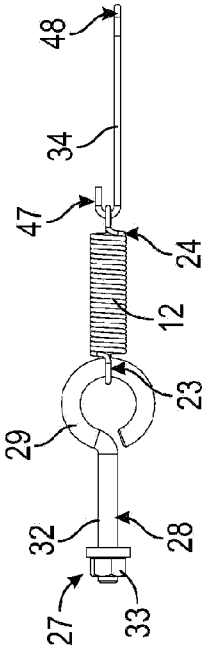
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FIG. 10

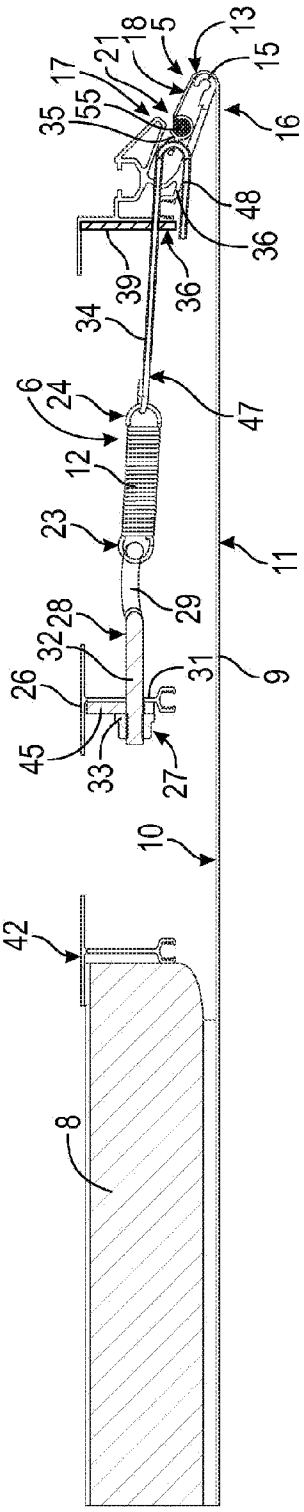
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FIG. 11

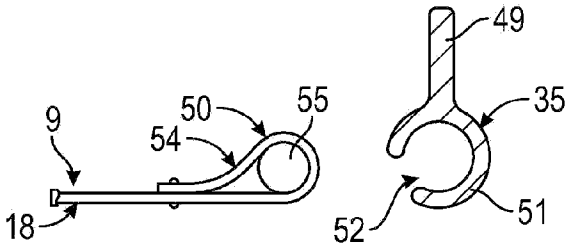

FIG. 12

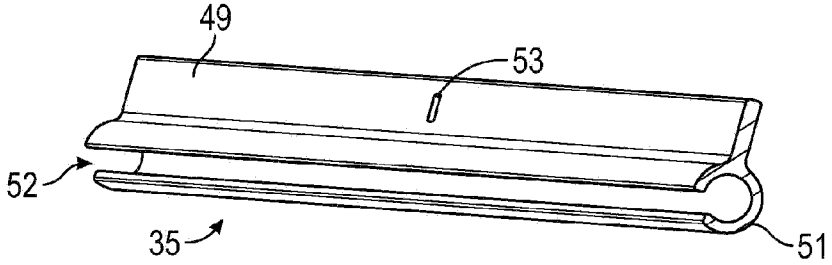

FIG. 13

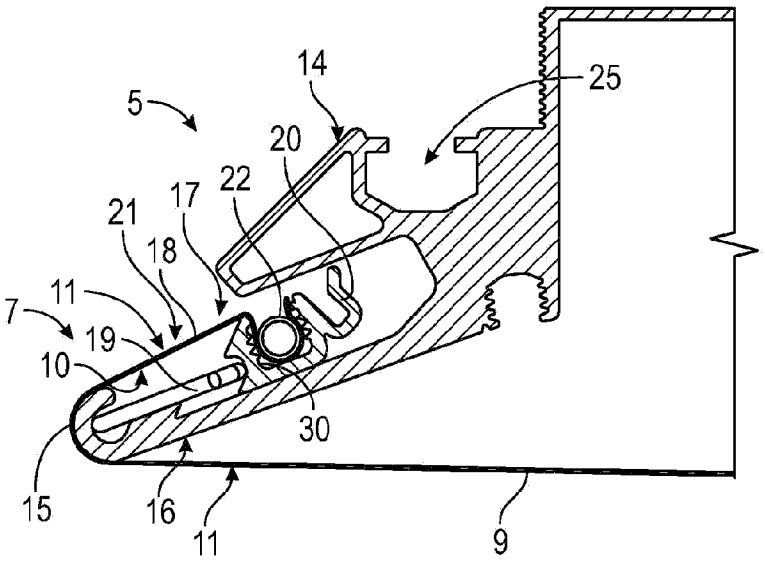

FIG. 14

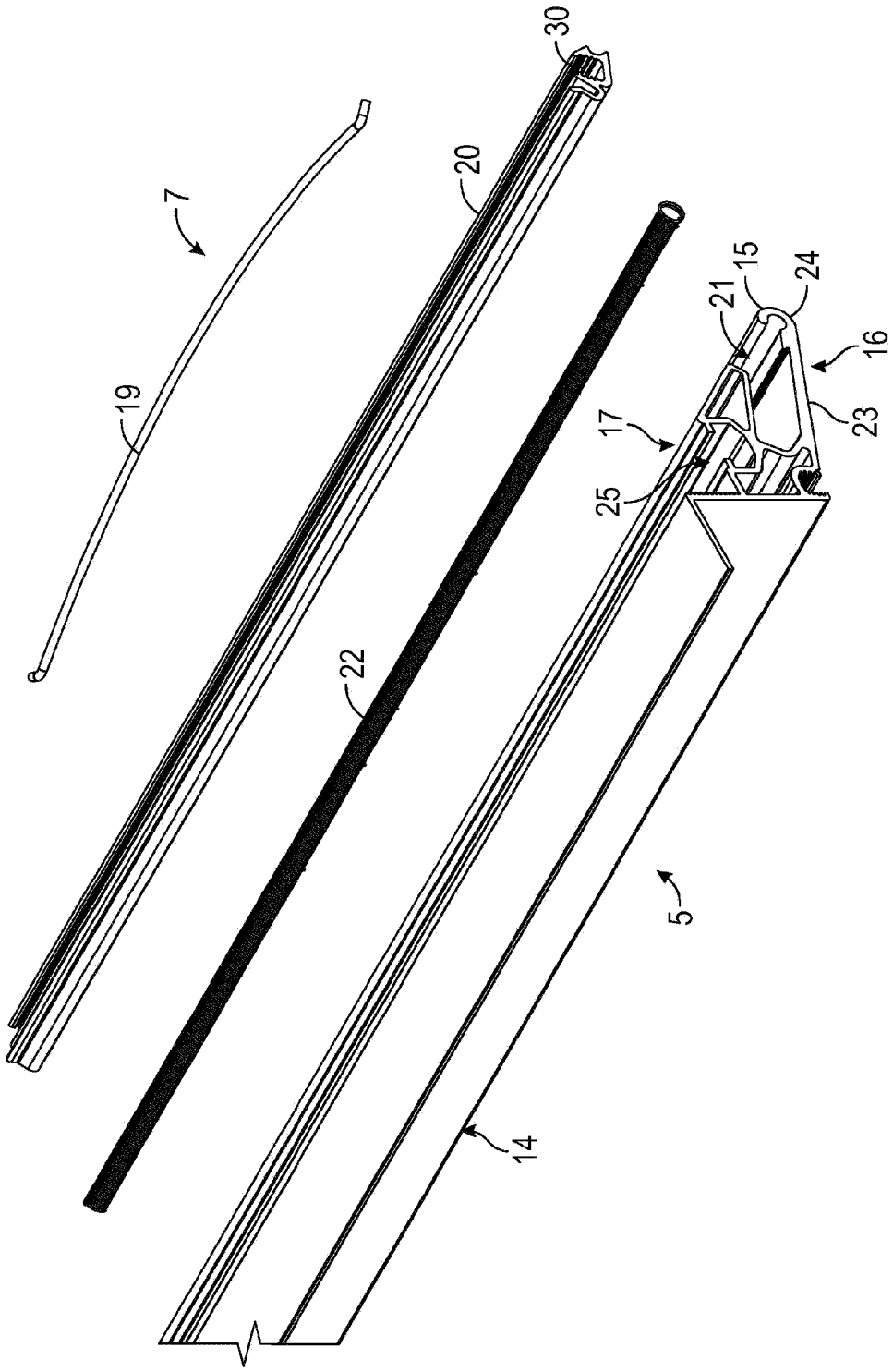

FIG. 15

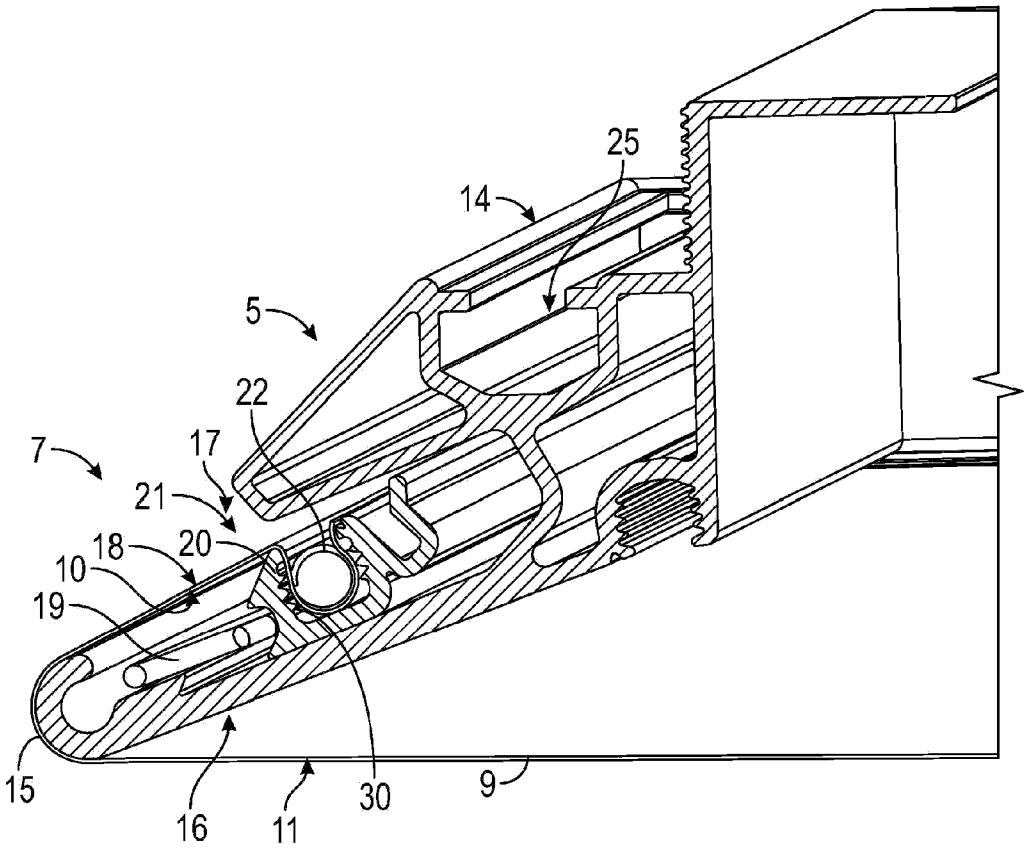

FIG. 16