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(54) **System for snap fixing of guides, particularly for sliding doors of pieces of furniture**

(57) A system for the snap fixing of upper and/or lower guides, particularly for the longitudinal sliding of doors of pieces of furniture, avoiding all traditional systems for fixing the guides with screws of various types, the system providing a clip (10) to be arranged, at appropriate intervals, on the upper surface of the top (C) of a piece of furniture, in addition to the provision of a similar clip (20) to be arranged, at appropriate intervals, on the lower surface of the footing (B) of the piece of furniture, so as to accommodate and lock a claw-shaped coupling edge (35-45) arranged on the respective profile (30-40) with guides be arranged on the top (C) and the footing (B), of which:

— the upper profile (30) provides for a first step of raised insertion of its claw-shaped edge (35) in the series of clips (10) of the top (C), then a second step of rotation of the profile (30) until it touches the outer surface of the top (C), with simultaneous snap action for the insertion of its opposite edge (37) against a series of detents (12) which are preferably coaxial to the clips (10) and with a consequent third step of engagement between the claw-shaped head (14-15) of the clips (10) and the claw-shaped head of the profile (35) with the upper profile;

— the lower profile (30) provides for a first similar step of raised insertion thereof within the series of clips (20) of the footing (B) and then a second step of rotation of the profile (40) until it touches the outer surface of the footing (B) and with a consequent third step of engagement of its claw-shaped edge (45) against the claw-shaped head (25) of the series of lower clips (20).

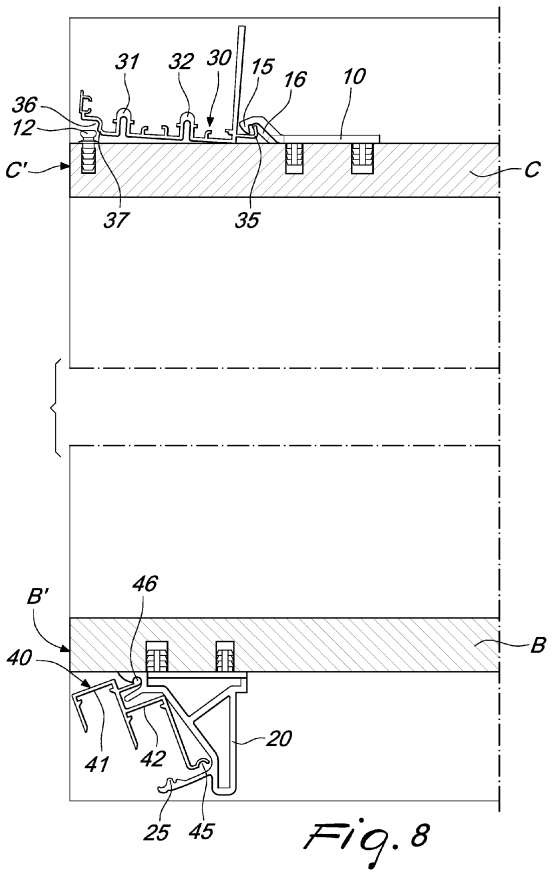

Fig. 8

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Description

[0001] The present invention relates to a system for snap fixing of upper and/or lower guides, particularly for the longitudinal sliding of doors of pieces of furniture, avoiding all traditional systems for fixing such guides with screws of various types.

[0002] The main characteristic of the present invention is that it provides an elastic hook or clip to be arranged at appropriate intervals on the upper surface of the top of a piece of furniture and a similar elastic hook or clip to be arranged at appropriate intervals on the lower surface of the footing of such piece of furniture, in order to accommodate and block a claw-shaped coupling edge arranged on the respective profile with guides to be fixed to such surfaces of the top and of the footing, of which:

- the upper profile provides for a first step of raised insertion of its claw-shaped edge in the series of clips of the top, then a second step of rotation of such profile until it touches the outer surface of the top, with simultaneous snap action for the insertion of its opposite edge against a series of detents which are preferably coaxial to the clips and with a consequent third step of engagement between the claw-shaped head of the clips and the claw-shaped head of the profile with the upper guides;
- the lower profile provides for a first similar step of raised insertion of its supporting profile within the series of clips of the footing and then a second step of rotation of such profile until it touches the outer surface of the footing and with a consequent third step of engagement of its claw-shaped edge against the claw-shaped head of the series of lower clips.

[0003] It is known that the sliding doors of a piece of furniture are supported and guided by adapted pairs of brackets, each of which has an end that is integral with the edge of the individual leaf and another end that is provided with a pulley, which is allowed to slide along at least one longitudinal guide thereof which is arranged preferably on the outer surface of the top of such piece of furniture. Such sliding doors or leaves are furthermore generally provided also with a pair of brackets applied to their lower edge, such brackets being also provided with respective rollers designed to slide in adapted longitudinal seats or guides that are arranged preferably on the outer surface of the footing of such piece of furniture, not as a support of the leaf but to prevent its oscillation transversely to the compartment to be closed and opened.

[0004] According to the background art which is by now well-established, the upper and lower longitudinal guides are formed from a single respective profile, which ensures their perfect parallel arrangement and a simplification of the work for installation on such outer surfaces of the top and footing, where each furniture manufacturer acquires customized profiles or plates that meet his constructive requirements in the best possible way or uses profiles that are already commercially available.

[0005] The arrangement of the guides or profiles on the outer surfaces of the top and of the footing is provided so as to allow full use of the compartment of the piece of furniture, avoiding the provision of bulky protrusions of guides and brackets in motion on the internal surfaces of such compartment. In furniture of the best quality, the panels of the top and of the footing in turn are enclosed by an upper surface of the piece of furniture and by the foot, so that its guides remain closed in confined compartments assigned only to the function of support and guiding for the sliding of their leaves. It is evident that for this quality furniture the application of the upper and lower guides by means of screws and the insertion of the respective pulleys or rollers must be performed before fixing the top and footing panels in their final seats, since otherwise the space for their screwing and application is not available.

[0006] The fixing of the profiles to the outer surfaces of the top and of the footing in fact can be performed with screws whose stems pass through holes provided in such profiles and are screwed for example into threaded bushes arranged beforehand on the respective surfaces of the top and of the footing. This fixing system, in addition to the considerable preparation and screwing time required, has the drawback that it can be performed only when the piece of furniture is turned upside down, since otherwise there would not be enough space for the power screwdriver or the manual screwdriver.

[0007] An improvement of this fixing method consists in the possibility of applying the screws from the internal surfaces of the top and footing, so that their stems are screwed into adapted seats, for example in the internal grooves of the respective guides, or in adapted threaded holes provided beforehand on flat portions of the respective profiles. However, even this fixing method, in addition to the fact that the head of each screw rests on the soft surface of the wood, albeit with the optional interposition of a washer, has the drawback that the heads of such screws can be seen, which is visually unpleasant and therefore has a negative impact.

[0008] Another considerable drawback of current screw fixing systems resides in that it might be necessary to repair or otherwise remove the profile of a piece of furniture in use, for example during a removal, or to replace or maintain such systems for suspending and guiding the sliding doors, which requires time, skills and equipment that only a qualified person can provide.

[0009] The aim of the present invention is to be able to fix stably and detachably the profiles for supporting and guiding the sliding doors of pieces of furniture respectively to their outer surfaces of the top and of the footing, with a simple snap-acting system that avoids any problem of application and visibility of the screws of their fixing both on the outer surface and on the inner surface of the top and of the footing.

[0010] Within this aim, an object of the invention is to be able to make it very easy and simple to apply and

move the guiding and supporting profiles of the sliding doors of a piece of furniture, so as to make these operations feasible even for a non-expert person who might have to remove them for example for a removal or for ordinary maintenance.

[0011] A further object of the present invention is to be able to reduce the time required for initial application and for any removal of the supporting and guiding profiles of sliding doors of pieces of furniture, also with an advantage in terms of production costs.

[0012] Another object of the present invention is to be able to minimize the upper and lower sliding compartments of the piece of furniture, ensuring their maximum useful volume.

[0013] This aim and these and other objects which will become better apparent hereinafter are achieved by an elastic hook or clip to be arranged, at appropriate intervals, on the upper surface of the top of the piece of furniture, and the provision of an elastic hook or clip to be arranged, at appropriate intervals, on the lower surface of the footing of said piece of furniture, in order to accommodate a claw-shaped coupling edge which is provided on the respective profile and has guides to be fixed to said surfaces; the upper profile providing for a first step of raised insertion of its claw-shaped edge in the series of clips of the top, then a second step of rotation of said profile until it touches the outer surface of the top, with simultaneous snap action for the coupling of its opposite edge against a series of detents which are preferably coaxial with the clips and with a consequent third step of engagement between the claw-shaped head of the clips and the claw-shaped head of the upper profile for guiding and supporting the leaf, whereas the lower profile provides for a similar first step of raised insertion of its guiding profile within the series of clips of the footing, then a second step of rotation of said profile, until it touches the outer surface of the floor, and with the consequent third step of engagement of its claw-shaped edge against the claw-shaped head of the series of lower clips.

[0014] Further characteristics and advantages of the present invention will become better apparent from the detailed description of a preferred but not exclusive embodiment thereof, which is illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a perspective view of a pair of elastic hooks or clips to be arranged, at appropriate intervals, on the outer surface of the top of a piece of furniture, in order to engage the profile for supporting and guiding the sliding doors of a piece of furniture, illustrated together with a coaxial pin thereof to be fixed to said outer surface of the top;

Figure 2 is a vertical view of the clip of Figure 1;

Figure 3 is a plan view of the same clip of Figure 2;

Figure 4 is a perspective view of a pair of elastic hooks or clips to be arranged, at appropriate intervals, on the outer surface of the footing of a piece of furniture, for the engagement of the lower guiding profile of said sliding doors which can be applied in combination with the engagement of the upper profile to be fixed with the clips of Figure 1;

Figure 5 is a perspective view of a portion of an upper profile for supporting and guiding the sliding leaves, to be fixed by snap action to the outer surface of the top of a piece of furniture, engaging it with a series of clips of Figure 1;

Figure 6 is a perspective view of a portion of a lower guiding profile of the sliding leaves, in combination with the upper profile of Figure 5, to be fixed by snap action to the outer surface of the footing of the piece of furniture, engaging it with a series of clips of Figure 4;

Figure 7 is a partial transverse sectional view of the top and floor of a piece of furniture to which the upper guiding and supporting profile of Figure 5 and a guiding profile of Figure 6 are to be applied respectively, engaging them by snap action with the clips of Figures 1 and 4, said profiles being shown in a first step of approach thereof provided by the fixing system of interest;

Figure 8 is a transverse sectional view, similar to the view of Figure 7, said upper and lower profiles being shown in a second step thereof of the same fixing system;

Figure 9 is a transverse sectional view, similar to the views of Figures 7 and 8, said upper and lower profiles being shown in their final step of engagement and snap coupling with the respective clips of Figures 1 and 4.

[0015] In all the figures, the same details are designated, or are understood to be designated, by the same reference numeral.

[0016] On the outer surface of the top C of a piece of furniture there are at least two or more series of three dead holes C1 C2 and C3, which are appropriately spaced from the edge C' of the opening compartment of such piece of furniture. Each series of holes C1 and C2 can be designed to accommodate by pressing the rough or, for example, fishbone-like stems 11a and 11b of a clip 10, whereas each hole C3 is designed to accommodate by pressing the rough stem 12a of a head or pin 12 that cooperates with the clip 10 for the fixing of the guides, as described hereinafter.

[0017] The clip 10 is constituted by a flat base or body 13, on the lower part of which the rough stems 11a and 11b are provided, the flat body 13 having an end with raised sides which is hook-shaped 14-15 and a central tab-like part 16 that is integral with the flat body 13. Since the clip 10 is made of a sufficiently elastic material, the tab 16 is flexible if pushed from the side of the hook 15 or of the edge B'.

[0018] With particular reference to Figure 4, on the lower or outer surface of a footing panel B of a piece of furniture there are at least two or more series of double dead holes B1, B2, which are appropriately spaced from

the edge B' of the opening compartment of such piece of furniture. Each series of holes B1-B2 can be designed to accommodate by pressing the rough stems 21a and 21b of a clip 20.

[0019] The clip 20 is constituted by a base 23, on the upper part of which the knurled stems 21a-21b are provided, the base 23 being joined to a cantilevered head hook 25 by means of a raised central part 24.

[0020] The end of the base 23 that is arranged proximate to the edge B' is provided with a transverse slot 22, which is, by way of indication, semi-cylindrical and is preferably associated with a guiding element 22a. Since the clip 20 is made of a sufficiently elastic material, the cantilever hook 25 is flexible if pushed in particular from the side of the edge B'.

[0021] With reference to Figure 5, a profile 30 is designed to be associated with the outer surface of the top C by interposition and snap coupling, between at least two clips 10 and two corresponding pins 12.

[0022] According to a random and non-binding constructive embodiment, the profile 30 comprises at least one pair of longitudinal guides 31-32 for the application of the pairs of pulleys for the sliding and support of each leaf of the piece of furniture, in addition to a series of ribs 33 and a resting surface 34.

[0023] For the embodiment of the fixing system being considered, the profile 30 is provided in particular with a claw-shaped longitudinal end 35 and with an opposite longitudinal groove 36, with an adjacent longitudinal abutment 37 thereof.

[0024] With reference to Figure 6, a profile 40 is designed to be associated with the outer surface of the footing B, by interposition and snap coupling, between the transverse slot or groove 22 and the claw-shaped end 25 of at least two clips 20.

[0025] According to a random and non-binding constructive embodiment, the profile 40 comprises at least one pair of tracks 41-42 for accommodating the lower guiding rollers of the leaves, which are already supported and guided by the upper profile 30, in addition to a longitudinal protrusion with a cylindrical base 46 and an opposite claw-shaped longitudinal end 45.

[0026] The fixing system according to the invention naturally provides for a preliminary step of preparing the outer surfaces of the top C and of the footing B of the piece of furniture to which one wishes to apply guides for sliding doors, after the application of at least two clips 10 and respective pins 12 on the outer surface of the top C and the application of at least two clips 40 on the outer surface of the footing panel B.

[0027] The first step of such system of interest, particularly for the application of the upper profile 30, provides for the adjacent arrangement and insertion of the claw-shaped longitudinal end 35 in the space comprised between the hooks 14-15 and their flexible wall 16 of at least one pair of clips 10, operating with the same profile 30 in an inclined position, so as to be able to pass below the hooks 14-15, as exemplified in Figure 7.

[0028] Likewise, the first step for the application of the lower profile 40 provides for the adjacent arrangement and insertion of the claw-shaped end 45 in the space comprised between the hook or claw 25 and the guiding wall 22a of at least one pair of clips 20, always operating with the profile 40 in an inclined position, so as to be able to pass the hook 45 between the claw 25 and the guiding element 22a, as exemplified again in Figure 7.

[0029] With reference to Figure 8, the second step of the system of interest provides for a slight rotational thrust of the upper profile 30, in order to move its flat surface 34 into contact with the outer surface of the top C, whereas for the lower profile 40 there is a similar slight rotational thrust toward the outer surface of the footing B and in the direction of the edge B', after the coupling of its cylindrical longitudinal portion 46 with the cylindrical seat 22 of at least two clips 20.

[0030] By continuing the rotation of the profile 30, when the edge 37 of its groove 36 encounters the heads 12, the profile 30 is pushed transversely toward the flexible wall 16 of the clips 10, and the flexible walls 16, in a third step, react with a snap action to engage the head of the pins 12 within the groove 36 of the same profile 30, which thus reaches the position of contact of its base 34 with the outer surface of the top C, remaining integrally trapped between the pins 12 and the flexible walls 16 of at least two clip 10.

[0031] Likewise, by a continuation of the rotation of the profile 40 on its pivot 46, when, in a corresponding third step, the hook 45 encounters the hook or claw 25 of at least one pair of clips 40, by utilizing the flexibility of the claw 25, coupling occurs between the hooks 25-45 at the time of contact of the bottom 41 with the lower surface of the footing B, thus engaging the profile 40 to remain firmly anchored to the footing B of the piece of furniture to be closed with sliding doors.

[0032] With the profiles 30 and 40 integrally fixed to the respective outer surfaces of the top C and of the footing B it is possible to apply the respective pulleys and rollers, with the corresponding brackets, for the support and guiding of the sliding leaves of the piece of furniture according to any known method.

[0033] On the basis of what has been described and illustrated so far, it is evident that in case of maintenance of the sliding devices, or for the disassembly and reassembly of the profiles 30 and/or 40, it is sufficient to reverse the steps described so far, operating with a slight lateral thrust that overcomes the reaction of the elastic means 16 and 25 and then a rotation of the profiles 30-40, in order to allow the extraction of the hooks 35-45 and achieve immediately the complete extraction of the respective profiles 30-40.

[0034] The particular shape of some parts 35-36 and 37 of the profile 30 and of some parts 45-46 of the profile 40, as well as of their clips 10 and 20, and the succession of steps described above, make it possible to provide the present system for applying the profiles 30-40 without having to resort to screws, overcoming the previous prob-

lems of space and time for screwing, in addition to problems of visibility, in accordance with the specified aim.

[0035] The application by snap coupling of the profiles 30-40 to their clips 10-20, in addition to being an extremely simple and easy operation, which can be performed even by a non-expert person, becomes possible even without the necessity of overturning of the piece of furniture and its consequent emptying beforehand, with further considerable advantages in terms of application times and costs, in accordance with other specified objects.

[0036] Of course, the shape of the profiles 30-40 for supporting and guiding the sliding leaves can vary for example in the number of guides 31-32 or of sliding seats 41-42, as well as in the arrangement and number of the ribs 33 or the shape of the claw-shaped parts 35-36-37 and 45-46, and likewise the shape of the clips 10-20 can vary, for example with the provision of a clip 10 that is extended so as to join and integrate also with the pin 12, with consequent adaptation also in the succession of the steps of actuation of the system described so far and of which in any case one wishes to protect the novelty and originality.

[0037] The disclosures in Italian Patent Application No. BL2010A000019 from which this application claims priority are incorporated herein by reference.

[0038] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A system for snap fixing of guides, particularly for sliding of doors of pieces of furniture, adapted to avoid all traditional systems for fixing said guides with screws of any type, **characterized in that** it provides for a preliminary step of preparing the outer surfaces of the top and footing, with the application of elastic hook- or claw-shaped clips, with subsequent application of the upper and lower profiles, where:

   — the upper profile provides for a first step of adjacent arrangement and insertion of its claw-shaped edge in the series of clips of the top, then a second step of rotation of said profile until it touches the outer surface of the top, with simultaneous snap action for the insertion of its opposite edge against a series of detents and with a consequent third step of engagement between the claw-shaped head of the clips and the claw-shaped head of the profile, said head remaining engaged against an elastic lamina of said upper clips;

   — the lower profile provides for a first similar step of adjacent arrangement and insertion into the series of clips of the footing and then a second step of rotation of said profile until it touches the outer surface of the footing and with a consequent third step of engagement of its claw-shaped edge against the claw-shaped head of said series of lower clips.

2. The system for snap fixing of guides, particularly for sliding doors of pieces of furniture, according to claim 1, **characterized in that** it provides for a preliminary preparation of the top (C) with at least two or more series of three dead holes (C1, C2, C3), which are conveniently spaced from the edge (C') of the opening compartment of said piece of furniture, each series of holes (C1, C2) being optionally intended to accommodate, by pressing, the rough, for example knurled or or fishbone-like, stems (11a, 11b) of a clip (10), whereas each hole (C3) is designed to accommodate, by pressing, the rough stem (12a) of a head or pin (12), which cooperates with said clip (10) for fixing said guides.

3. A system for snap fixing of guides, according to claim 2, **characterized in that** the clip (10) is constituted by a flat body or base (13), on the lower part of which the rough stems (11a, 11b) are provided, said flat body (13) having a raised part provided with two lateral claw-shaped ends or hooks (14-15) with an intermediate tab (16) which is lowered, with respect to the claw-shaped part (14-15), so that since the clip (10) is made of a sufficiently elastic material said tab (16) becomes flexible as a consequence of any thrust applied from the side of the hooks (14-15) or of the edge (C').

4. The system for snap fixing of guides, particularly for sliding doors of pieces of furniture, according to claim 1, **characterized in that** it provides for a preliminary preparation of the footing (B) with at least two or more series of double dead holes (B1-B2), which are appropriately spaced from the edge (B') of the opening compartment of said piece of furniture, where each series of holes (B1-B2) can be intended to accommodate, by pressing, the rough stems (21a, 21b) of a clip (20).

5. The system for snap fixing of guides according to claim 4, **characterized in that** the clip (20) is constituted by a base (23) on the upper part of which the rough, for example fishbone-like, stems (21a-21b) are provided, said base (23) being joined to a flexible head hook (25) by means of a raised central part (24);

6. The system for snap fixing of guides according to

claim 5, **characterized in that** one end of the base (23) is arranged proximate to the edge (B') of the footing (B) and is provided with a transverse slot (22) which is, by way of indication, semi-cylindrical and preferably associated with a guiding element (22a).

7. The system for snap fixing of guides according to claims 1 to 3, **characterized in that** the upper profile (30) comprises at least one pair of longitudinal guides (31, 32) for the application of the pairs of pulleys for the sliding and support of a corresponding number of leaves of the piece of furniture, in addition to a series of ribs (33) and a base or resting surface (34), said profile (30) being provided with a claw-like longitudinal end (35) and with an opposite longitudinal groove (36), with an adjacent longitudinal abutment thereof (37).

8. A system for snap fixing of guides according to claims 1 to 5, **characterized in that** a profile (40) is designed to be associated with the outer surface of the footing (B) by snap engagement and interposition, between the transverse slot or groove (22) and the flexible and claw-shaped end (25) of at least two clips (20), said profile (40) comprising at least one pair of tracks (41-42) for the accommodation and sliding of the lower guiding rollers of the leaves which are already supported and guided by the upper profile (30), in addition to a longitudinal protrusion with a cylindrical base (36) and a claw-shaped longitudinal end (45).

9. The system for snap fixing of guides, particularly for sliding doors of pieces of furniture, according to claims 1 to 8, **characterized in that** it provides for a preliminary step of preparation of the outer surfaces of the top (C) and of the footing (B) of the piece of furniture to which guides for sliding doors are to be applied, after the application of at least two clips (10) and respective pins (12) on the outer surface of the top (C) and application of at least two clips (20) on the outer surface of the footing panel (B).

10. The system for snap fixing of guides according to claims 1 to 9, **characterized in that** it provides for a first step of adjacent arrangement and insertion of the claw-shaped longitudinal end (35) of the profile (30) in the space comprised between the hooks (14-15) and the flexible tab (16) of at least one pair of clips (10), operating with said profile (30) in an inclined position, so as to be able to pass below the claw (15), as provided by the adjacent arrangement and insertion of the end of the claw-shaped edge (45) of the profile (40) in the space comprised between the hook (25) and the guiding element (22a) of at least one pair of clips (20), said profile (40) operating in an inclined position, so as to be able to pass the hook (45) between the claw (25) and the guiding element (22a).

11. The system for snap fixing of guides according to claim 10, **characterized in that** it provides for a second step of the system of interest, with the rotation of the upper profile (30), in order to bring its flat surface (34) into contact with the outer surface of the top (C), whereas for the lower profile (40) there is a similar rotation toward the outer surface of the footing (B) and in the direction of the edge (B'), following the engagement of its cylindrical longitudinal portion (46) in the cylindrical seat (22) of at least two clips (20).

12. The system for snap fixing of guides, according to claims 1 to 11, **characterized in that** by continuing the rotation of the profile (30), when the edge (37) of its groove (36) encounters the heads (12), said profile (30) is pushed toward the flexible wall (16) of the clips (10), said flexible wall (16), in a third step, reacting with a snap action so as to engage the head of said pins (12) within the groove (36) of said profile (30), said profile (30) being thus able to reach the position of contact of its base (34) with the outer surface of the top (C), remaining firmly trapped between the pins (12) and the flexible walls (16) of at least two clips (10), whereas by continuation of the rotation of the profile (40) on its pivot (46), when the hook (45) encounters the hook or claw (25) of at least one pair of clips, in a corresponding third step, coupling occurs between said hooks (25-45) at the time of contact of the bottom (41) with the lower surface of the footing (B), engaging said profile (40) so that it remains firmly anchored to said footing (B).

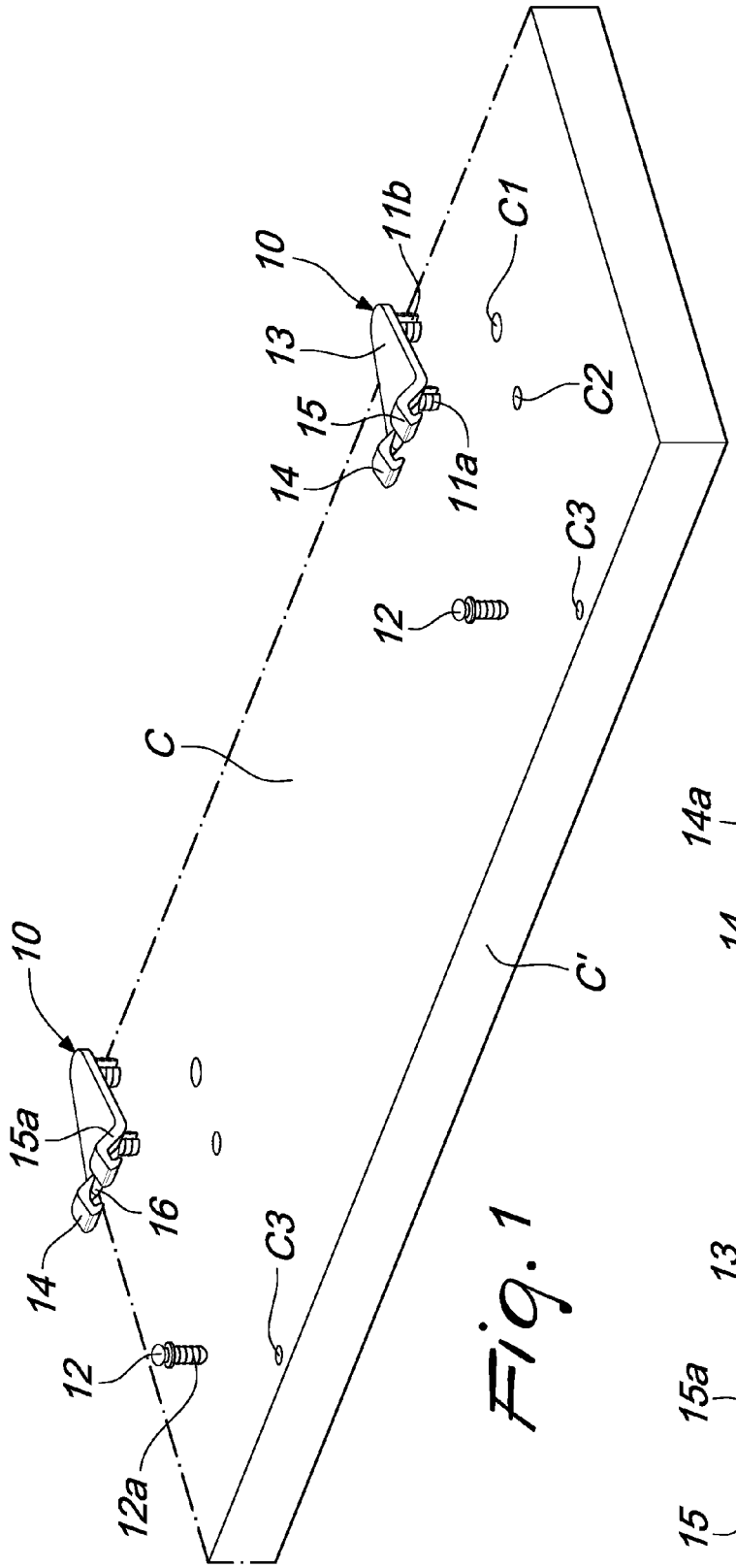

Fig. 1

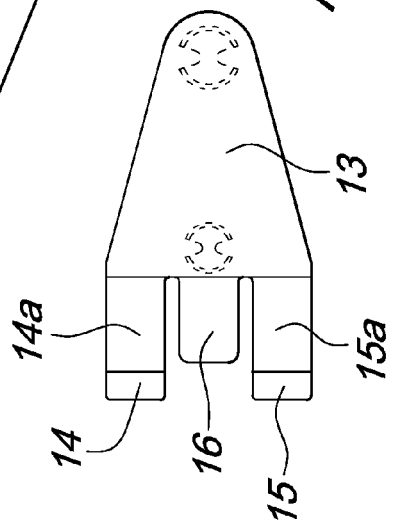

Fig. 3

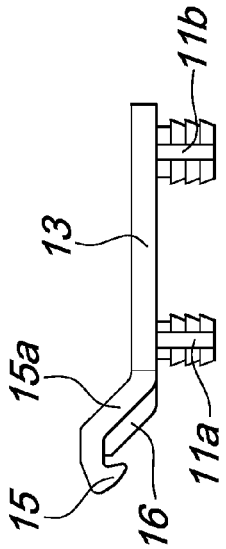

Fig. 2

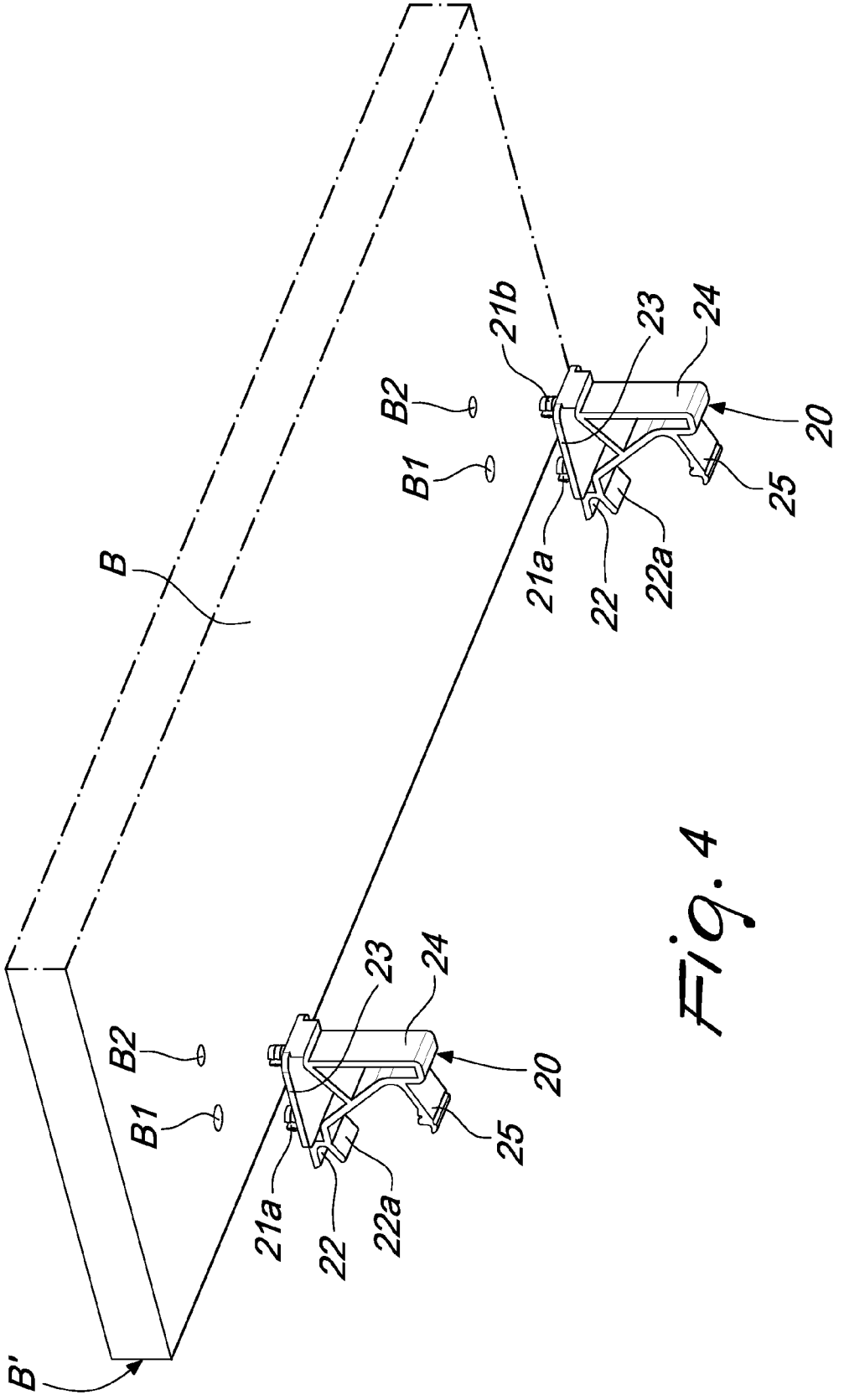

Fig. 4

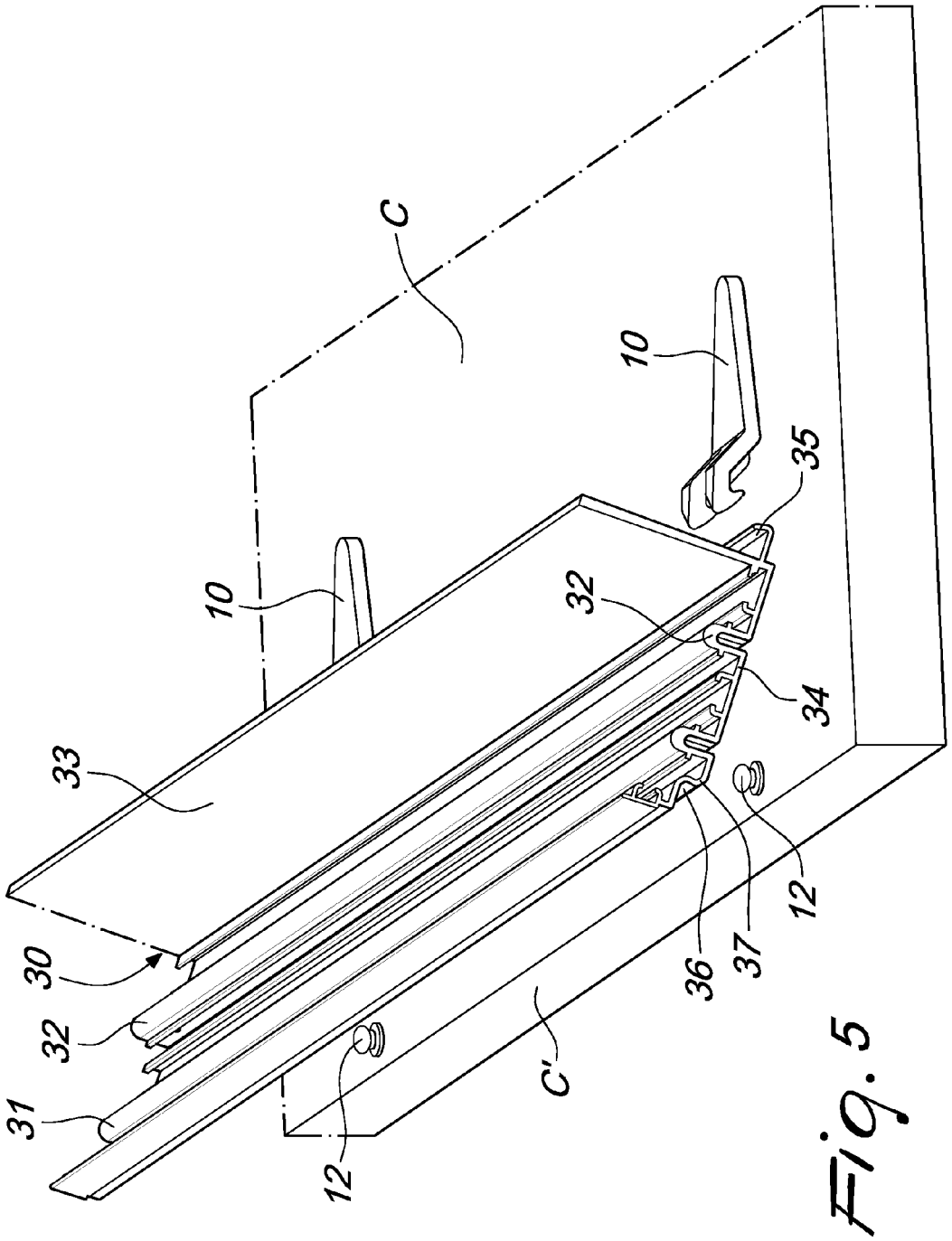

Fig. 5

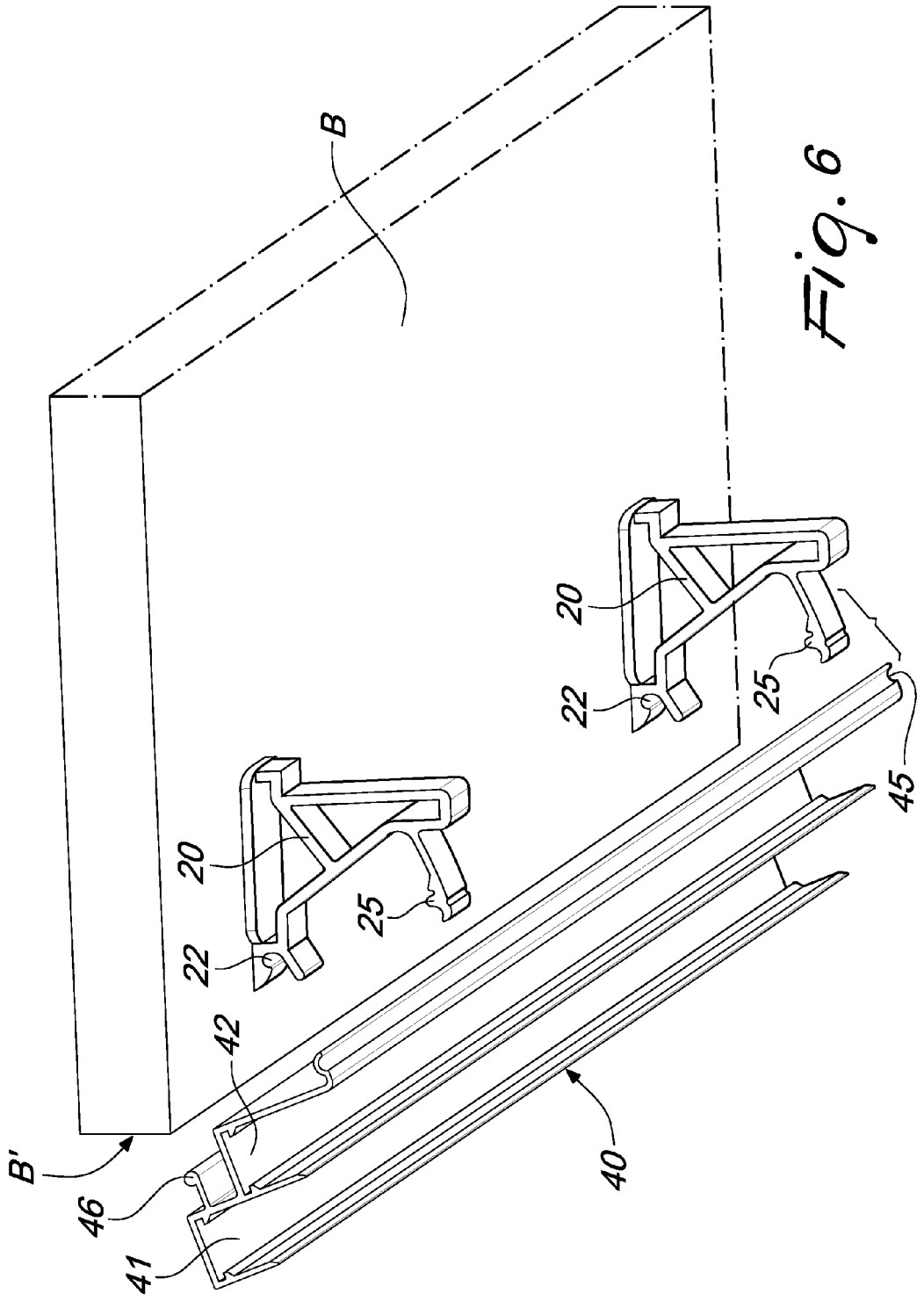

Fig. 6

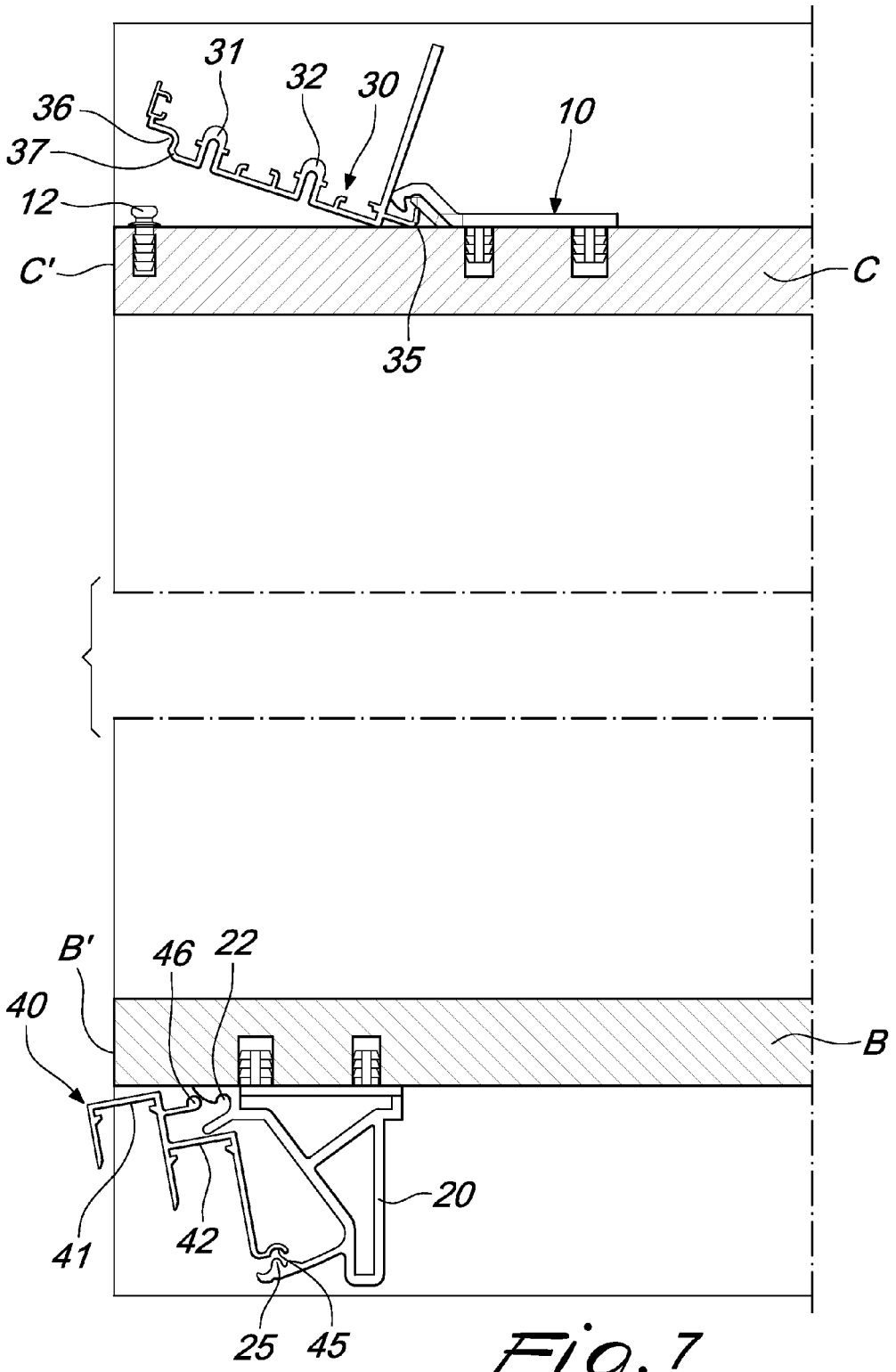

Fig. 7

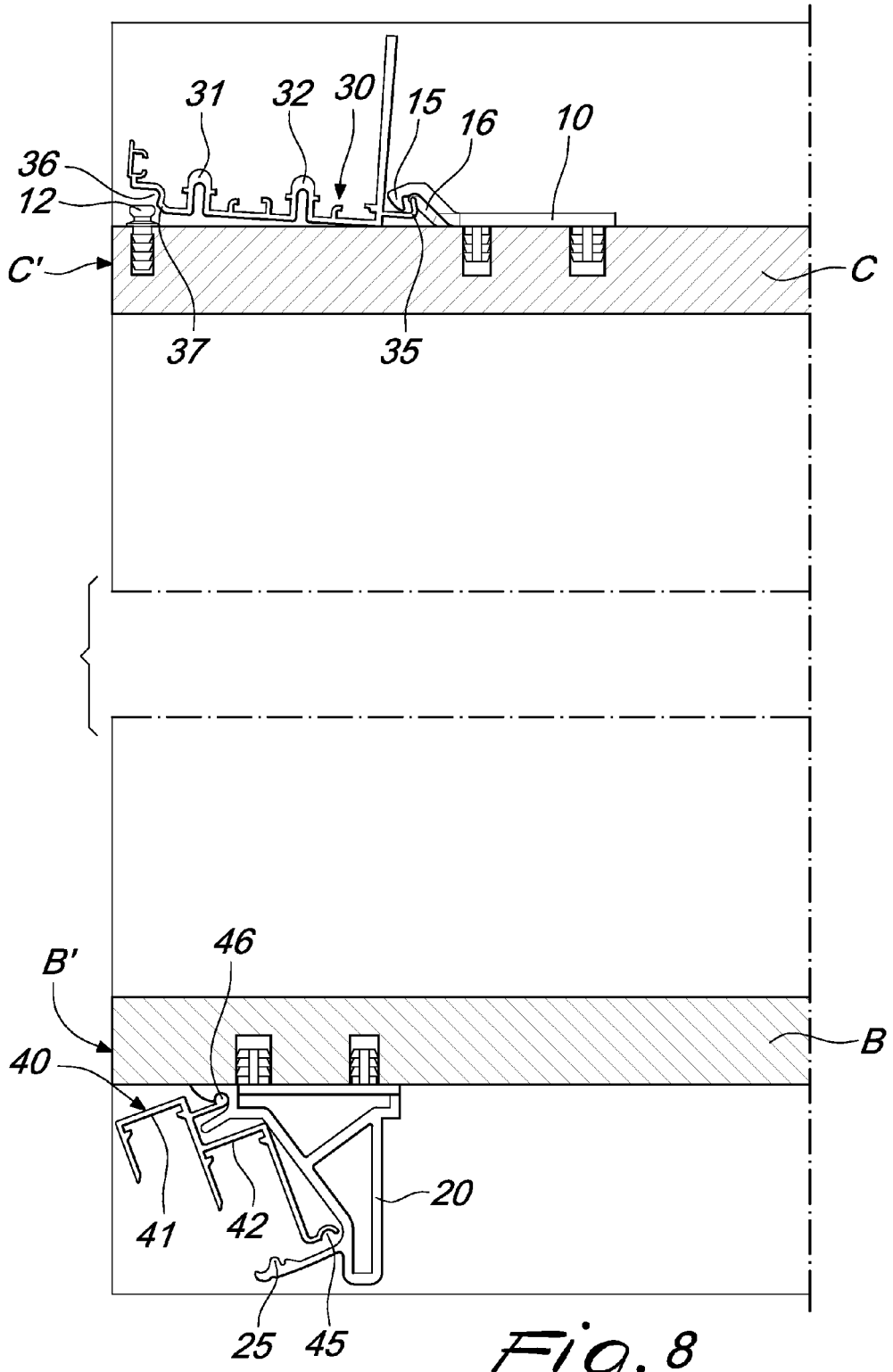

Fig. 8

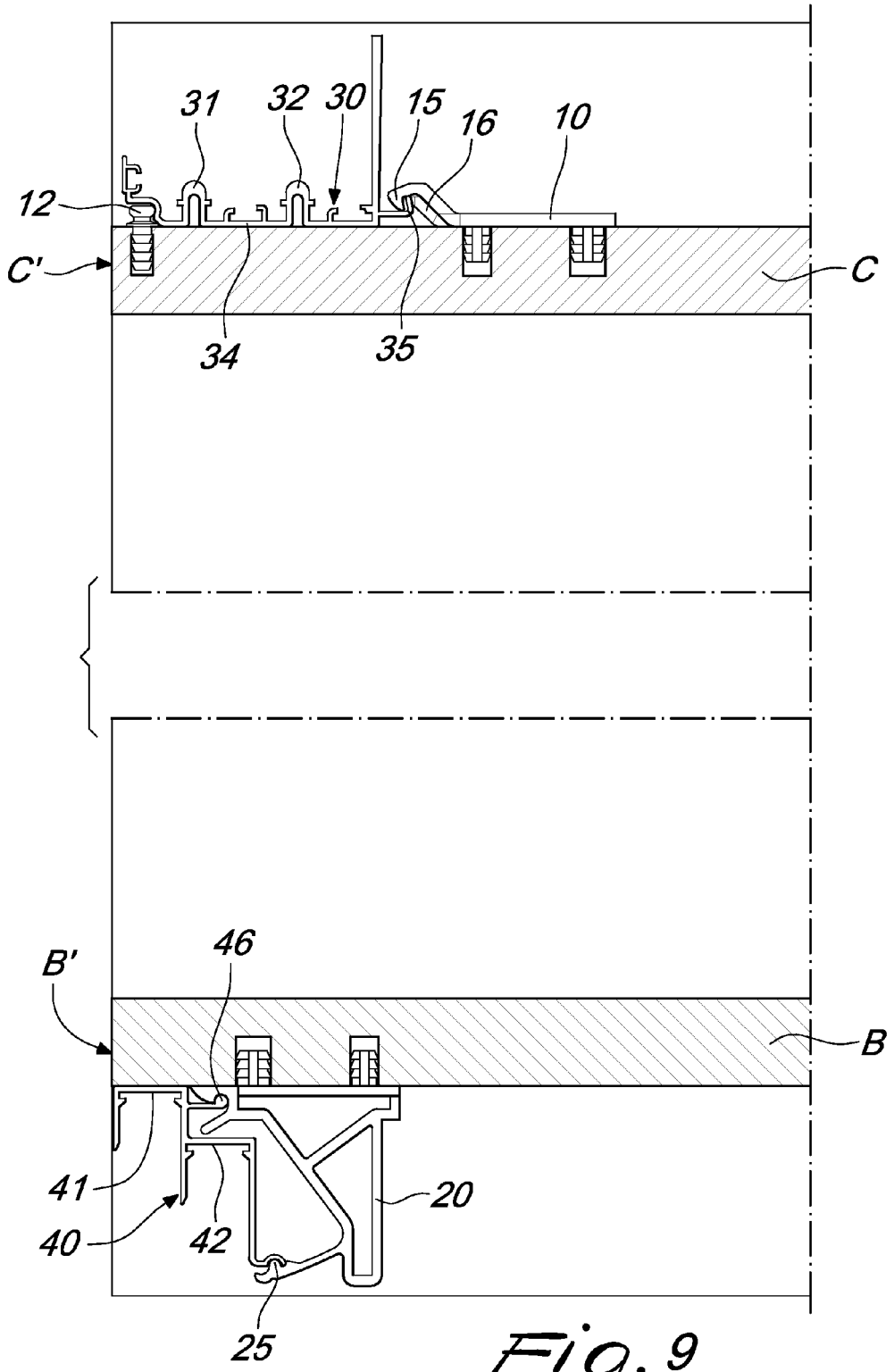

Fig. 9

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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