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(54) Supporting structure for tops of tables, desks or similar

(57) Supporting structure (10) for tops (11) of tables (12), desks or similar, comprising at least a substantially horizontal beam element (13) associated with vertical uprights (14), wherein both the beam element (13) and the uprights (14) consist of tubular profiles (15), the tubular profiles (15a, 15b) being achieved in a single piece of a desired section and able to be associated with each other by means of assembly elements (20) suitable to be inserted and clamped to the ends of at least one (15a) of the tubular profiles, each of the assembly elements (20) including at least an insertion seating (19) suitable to cooperate with corresponding attachment means (18), the attachment means (18) cooperating with insertion means (21) made in at least a second tubular profile (15b).

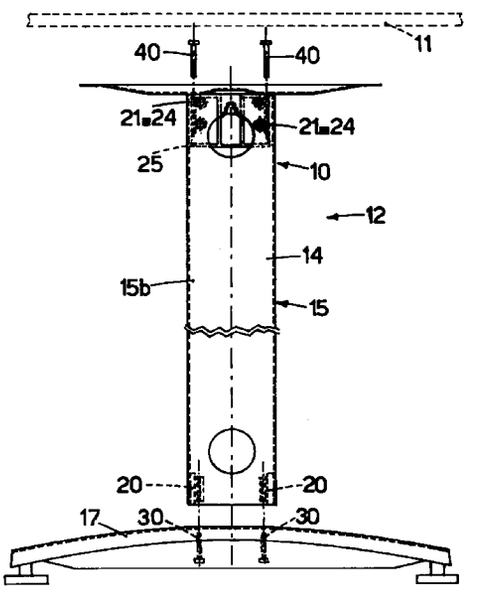

fig.2

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Description

FIELD OF THE INVENTION

[0001] This invention concerns a supporting structure for the tops of tables, desks or similar, as set forth in the main claim.

[0002] The invention is employed in the field of furniture, particularly but not exclusively office furniture, as a structure suitable to support the tops of tables, desks, writing-tables or similar, enabling the tops to be composed in a modular manner.

BACKGROUND TO THE INVENTION

[0003] The state of the art includes a plurality of structures suitable to support the tops of furniture components such as tables, desks or similar.

[0004] One type of support which is particularly common comprises a single, substantially horizontal beam element associated at the ends with vertical uprights functioning as legs.

[0005] The beam elements and the uprights consist of box-like profiles made of sheet metal, normally obtained by coupling two C-shaped elements, and are associated with each other by means of connection elements, such as hooks, brackets, plates or similar, attached on the outside of the profiles.

[0006] This type of supporting structure is very much appreciated due to the simplicity of its construction and its limited production costs; it can be composed in many different ways and allows to achieve furniture components with a plurality of differently arranged surfaces.

[0007] The main disadvantage of this embodiment is that the structure is not very stable when assembled, as it is obtained by using the connection elements, which do not always guarantee an adequate hold.

[0008] To obtain a greater stability of the assembly connection, it is therefore necessary to provide a considerable number of connection elements and attachment means and/or oversize said elements and means.

[0009] However, this entails greater production costs, an increase in the assembly times and in the weight of the supporting structure.

[0010] These problems are even more accentuated when complex compositions have to be achieved or compositions with a considerable number of surfaces.

[0011] To be more exact, when a modular composition is achieved, comprising several tables or desks connected together, the systems of reciprocal attachment can easily be deformed and do not ensure the desired solidity in the event of a movement of one of the tables with respect to the other.

[0012] Moreover, there are only limited possibilities of attaching one table and another in an angled configuration.

[0013] Furthermore, there is a strong possibility that the tubular elements may be deformed due to the clamping of the reciprocal clamping elements.

[0014] A further disadvantage is that the structures known to the state of the art are difficult to assemble.

[0015] The present Applicant has devised and embodied this invention to overcome these shortcomings and to obtain further advantages.

SUMMARY OF THE INVENTION

[0016] The invention is set forth and characterised in the main claim, while the dependent claims describe other characteristics of the invention.

[0017] The purpose of the invention is to provide a supporting structure for the tops of tables, desks or similar which will guarantee a stable and safe connection between the uprights and the beam elements, preventing any possible deformations even when there are heavy stresses, using a limited number of connection and attachment elements and limiting to a minimum the number of said elements arranged in view.

[0018] Another purpose of the invention is to achieve an aesthetically pleasing and extremely versatile supporting structure which will allow considerable possibilities of composition, even angled, of the surfaces and/or variations in size of the top, in height and/or in length.

[0019] A further purpose of the invention is to achieve an economic supporting structure, easy and quick to assemble.

[0020] The supporting structure according to the invention provides beam elements and uprights consisting of tubular profiles, each achieved in a single tube, which are associated together by means of attachment means cooperating with assembly elements suitable to be inserted and clamped to the ends of the tubular profiles.

[0021] Each of the assembly elements has at least an insertion seating suitable to cooperate with the attachment means.

[0022] According to the invention, to clamp two tubular profiles, a first tubular profile is equipped with the assembly element, for example inserted into one of the ends in a retracted position; the second of the tubular profiles, on the contrary, is provided with means, for example through holes or eyelets, into which mating attachment means are inserted, which couple with and constrain the assembly element on the first tubular profile.

[0023] According to a variant, a spacer element is inserted into the second tubular profile with the function of preventing the tubular profile from being crushed during the clamping action of the attachment means.

[0024] According to a further variant, the spacer element has through holes cooperating with the through holes provided on the second tubular profile which allow the attachment means to pass.

[0025] In a preferential embodiment of the invention, the assembly elements and/or the spacer elements are constrained together and engaged inside the respective

tubular profiles, in correspondence with at least one of the respective ends.

[0026] According to a variant, the assembly elements and/or the spacer elements include elastic means which allow them to contract so they can be inserted inside the tubular profiles and subsequently expand inside so that they are clamped and engaged inside.

[0027] According to another embodiment, the assembly elements are attached to the tubular profile by specific, auxiliary clamping means.

[0028] According to another variant, the assembly elements and/or the spacer elements include positioning means cooperating with corresponding positioning means made on the tubular profiles.

[0029] According to a further variant, the assembly elements and/or the spacer elements include positioning and retaining means cooperating frontally in abutment with the perimeter edge of the tubular profiles.

[0030] According to another variant, the assembly elements and/or the spacer elements include screw seatings cooperating with the attachment means to attach plates to support and associate the table top.

[0031] According to the invention, in the case of beam elements arranged on the same plane and associated with a single upright on opposite sides thereof, the beam elements may be arranged either aligned or off-axis, which allows the attachment means to be screwed frontally into the respective seatings of the assembly elements.

[0032] According to a variant of the invention, bases or feet are associated with the base of the uprights by means of the assembly elements.

[0033] By using the assembly elements, the supporting structure according to the invention therefore achieves a stable and safe association of constraint between the parts, reducing to a minimum the assembly elements left in sight; this is indispensable only in the case of particularly complex compositions, or compositions which have a large number of surfaces to be used.

BRIEF DESCRIPTION OF THE DRAWINGS

[0034] The attached Figures are given as a non-restrictive example, and show some preferential embodiments of the invention wherein:

Fig. 1 is a plane view of a table with a supporting structure according to the invention;
Fig. 2 is an enlarged front view of the table in Fig. 1;
Fig. 3 is a partly plane view of a possible composition which can be achieved with the supporting structure according to the invention;
Figs. 4a÷4c are plane views of some examples of multiple associations between beam elements and uprights of the supporting structure according to the invention;
Fig. 5a shows an assembly element associated with a tubular profile of the supporting structure according to the invention;
Fig. 5b is a view from A of Fig. 5a;
Fig. 6a shows a variant of Fig. 5a;
Fig. 6b is a view from B of Fig. 6a;
Fig. 7a shows a detail of the assembly elements between upright and base of the table shown in Fig. 2;
Fig. 7b shows the section from C to C of Fig. 7a;
Fig. 8 shows a detail of a spacer and vertical attachment element of the supporting structure according to the invention;
Fig. 9a is a front view of a supporting structure according to the invention which can be adjusted in height;
Fig. 9b is a view from D of Fig. 9a;
Fig. 10 shows an angled column element of the supporting structure according to the invention;
Fig. 11 shows a detail of the supporting structure according to the invention in a possible embodiment;
Fig. 12a shows the assembly element of Fig. 11;
Fig. 12b is a view from E of Fig. 12a;
Fig. 13a is a side view of the spacer element of Fig. 11;
Fig. 13b is a view from F of Fig. 13a;
Fig. 14 shows a cover element for tubular elements of the supporting structure according to the invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0035] With reference to the attached Figures, the number 10 denotes the supporting structure in its entirety for a top 11 of a table 12.

[0036] The supporting structure 10 comprises substantially horizontal beam elements 13 associated at the ends with vertical uprights 14 which function as the legs of the table 12.

[0037] Each beam element 13 and upright 14 consists of tubular profiles 15 advantageously made in a single piece and of metal.

[0038] The tubular profiles 15 in this case are rectangular in section, but the invention is applicable also in the case of tubular profiles 15 with a different section, such as for example round, elliptical, polygonal or otherwise.

[0039] In this case, moreover, the beam elements 13 are of the telescopic type, which allows the uprights 14 to be positioned at a variable distance according to the length and/or arrangement of the tops 11.

[0040] In the embodiment shown here the supporting structure also comprises plates 16 on which the top 11 rests and is associated; the plates 16 are attached above, and bases 17 are attached below, each upright 14.

[0041] The beam elements 13 and the uprights 14 are constrained together by means of screw elements 18,

which can be coupled inside the corresponding screw seatings 19 provided in appropriate assembly elements 20 suitable to be inserted and clamped to the ends of the tubular profiles 15.

[0042] To be more exact, the association between two tubular profiles 15, constituting respectively a beam element 13 and an upright 14, is obtained by inserting and clamping an assembly element 20 on a first tubular profile 15a in correspondence with one end, while the second tubular profile 15b is provided with through holes 21 into which screw elements 18 are inserted, the screw elements 18 also being inserted into the screw seatings 19 of the assembly element 20.

[0043] In this case, the assembly elements 20 are inserted at the ends of the beam elements 13, and housed substantially in a retracted position inside, while the through holes 21 are made on the uprights 14.

[0044] The assembly elements 20 may have different shapes and a different number of screw seatings 19 according to the type of assembly to be made, the geometry of the tubular profiles 15 and/or other specific requirements.

[0045] In the embodiments shown in Figs. 3-8, the screw seatings 19 are made in a single piece on the assembly elements 20.

[0046] According to the variant shown in Figs. 11-12b, the screw seatings 19 are defined by threaded inserts 50 which can be associated with the assembly elements 20 in correspondence with specific housings 43 and communicating with the outside of the relative assembly element 20 by means of channels 44 made in alignment with the through holes 21 on the upright 14 which is to be connected.

[0047] In the preferential embodiment shown in Figs. 5a, 5b, 6a and 6b, the assembly elements 20 can be clamped and engaged to the tubular profiles 15 by means of ridges 22 which are inserted between coupling slits 23 made on the tubular profiles 15.

[0048] Figs. 6a, 6b show an assembly element 20 for tubular profiles 15 with a substantially rectangular section comprising two distinct identical bodies 20a, arranged substantially symmetrical with respect to the tubular profile 15, on which the screw seatings 19 are made.

[0049] Between the two bodies 20a, there is an elastic fin 20b and a connection fin 20c, made in a single piece with the bodies 20a.

[0050] The assembly element 20 is inserted into the tubular profile 15 by compressing the two bodies 20a towards each other; the two bodies 20a elastically approach each other due to the presence of the elastic fin 20b, and thus the insertion operations are made easier.

[0051] Once inside the tubular profile 15, the assembly element 20 is positioned so as to bring the ridges 22 in correspondence with the coupling slits 23; the two bodies 20a are then released, and again take up their initial, distanced position and are clamped and engaged.

[0052] In the embodiment shown in Figs. 5a and 5b, the assembly element 20 is inserted into a tubular profile 15 with a square section; it comprises four elastic extensions 20d, substantially T-shaped, each of which with a relative ridge 22.

[0053] When the assembly element 20 is inserted, the four elastic extensions 20d are reciprocally brought nearer to facilitate this operation, subsequently, they are released so as to insert the respective ridges 22 into corresponding coupling slits 23 made on the four sides of the tubular profile 15, causing the assembly element 20 to be clamped and engaged.

[0054] This position of the elastic extensions 20d defines at the center the screw seating 19 for a single screw element 18 which, once screwed in, prevents the assembly element 20 from coming out.

[0055] In an identical way, it is possible to have assembly elements 20 which comprise a greater or smaller number of elastic extensions 20d according to the section of the tubular profile 15 inside which they have to be inserted.

[0056] In the embodiment shown in Figs. 11, 12a and 12b, the assembly element 20 is provided with two blind cavities 41 suitable to be arranged in alignment with mating through holes provided at the end of the first tubular profile 15a.

[0057] Inside the blind cavities 41 and the through holes relative attachment pins are suitable to be inserted and engaged, for example taper pins, suitable to clamp the assembly element 20 inside the first tubular element 15a.

[0058] According to a variant, the blind cavities 41 are threaded inside and the assembly element 20 is clamped by means of screws.

[0059] In this embodiment, the assembly element 20 has a wider, abutment part 42 at the front, which is greater in size than the section of the first tubular profile 15a.

[0060] When the assembly element 20 is inserted, the wider part 42 abuts against the perimeter edge 115a of the first tubular profile 15a, causing the correct positioning and centering of the assembly element 20 with respect to the profile 15a and preventing any further movements.

[0061] In a preferential embodiment shown in Figs. 2 and 11, inside the second tubular profile 15b, in this case constituting the upright 14, a spacer element 25 is inserted in correspondence with the zone where the first and second tubular profile 15a, 15b connect.

[0062] The spacer element 25 has the function of preventing the second tubular profile 15b from being crushed when the screw elements 18 are tightened.

[0063] In this case, the spacer element 25 advantageously has through holes 24 which are aligned with the through holes 21 on the second profile 15b for the screw elements 18 to be inserted.

[0064] In the embodiment shown in Fig. 8, the spacer

element 25 has an identical conformation to that of the assembly element shown in Figs. 6a, 6b, consisting of two bodies 25a constrained by an elastic fin 25b and a connection fin 25c which facilitate the insertion of the spacer element 25 inside the tubular profiles 15.

[0065] The spacer element 25 also includes ridges 26 which are inserted into coupling slits 27 on the tubular profiles 15, by means of which it can be clamped and engaged inside.

[0066] There are also threaded holes 28 on the spacer element 25, into which screw elements 40 are screwed and used to attach the plate 16 on which the top 11 rests and is associated.

[0067] In the embodiment shown in Figs. 11, 13a and 13b, the spacer element 25 has a pair of blind cavities 45 arranged in alignment with mating through holes provided on the second tubular profile 15b and inside which respective taper pins, suitable to clamp the spacer element 25, are suitable to be inserted and engaged.

[0068] According to a variant, the blind cavities 45 are threaded inside and cooperate with mating screws to clamp the spacer element 25.

[0069] The spacer element 25, moreover, has at the lower part two housings 46 to position mating threaded inserts 51 inside which screw elements 40 are suitable to be screwed; the screw elements 40 can be inserted through channels 47 made lengthwise on the spacer element 25.

[0070] The screw elements are used to attach the plate 16.

[0071] In this embodiment, the plate 16 in its assembled condition is arranged partly inside the upright 14 and aligned at the upper part with the upper surface of the beam element 13 (Fig. 11), which ensures a better support for the top 11 of the table 12.

[0072] Moreover, in the assembled condition, the plate 16 protrudes laterally with respect to the upright 14 and is arranged, on the side where it is associated with the beam element 13, inside a groove 42a made on the wider part 42 of the assembly element 20.

[0073] According to a variant, the spacer element 25 is provided with a pair of attachment seatings 48 in correspondence with which a connection profile, not shown here, is suitable to be anchored; the connection profile is used when two beam elements 13 are associated together in a position opposite the upright 14.

[0074] In the embodiment shown in Fig. 2, the bases 17 are constrained to the uprights 14 by means of a pair of assembly elements 20, inserted at the ends of each upright 14, each of which with its own screw seating 19 for respective screw elements 30.

[0075] In this case the assembly elements 20 include positioning shapings 31 cooperating with apertures 32 made on the uprights 14 by means of which the assembly elements 20 are arranged in the correct position inside the tubular profile 15 (Fig. 7a).

[0076] In this position, the assembly elements 20 are clamped with screw means (not shown here) which screw into mating threaded bushes 29, or into suitable threaded holes.

[0077] In the embodiment shown in Figs. 9a, 9b, the assembly element 20 to associate the base 17 with the upright 14 is made in a single piece and allows the height of the supporting structure 10 to be varied.

[0078] The assembly element 20 is telescopically inserted inside the upright 14 and has two pairs of threaded bushes 29, or threaded holes, cooperating with a plurality of through holes 33 made on the sides of the upright 14.

[0079] According to the desired height which the supporting structure 10 is to have, the assembly element 20 is made to slide inside the upright 14 so as to align the threaded bushes 29 with the desired through holes 33.

[0080] The assembly element 20 is clamped into the desired position by screwing in appropriate screw elements 39 into the threaded bushes 29.

[0081] The assembly element 20 is associated with the base 17, as in Fig. 2, by coupling screw elements (not shown here) into the screw seatings 19.

[0082] Within the field of this invention, there may be other solutions wherein the uprights 14 are associated telescopically with the base 17.

[0083] For example, there may be an assembly element 20 equipped with lateral pins which can be elastically compressed and are suitable to be selectively inserted into mating through holes distributed over the height of the upright 14.

[0084] The supporting structure 10 according to the invention allows considerable possibilities of composition, and a plurality of tops 11 can be assembled with different arrangements or a single top 11 of considerable size can be supported.

[0085] If several tops 11 aligned longitudinally are to be associated, or a single top 11 of a considerable size is to be supported, it is necessary to prepare a plurality of beam elements 13 arranged reciprocally parallel, but opposite the uprights 14.

[0086] In these cases, the beam elements 13 are associated off-axis with respect to the uprights 14 to allow the screw elements 18 to be screwed in from the front of the relative screw seatings 19 of the assembly elements 20 (Fig. 3).

[0087] In the case that a single upright 14 is associated with a plurality of beam elements 13, differently directed but lying on the same plane (Figs. 4a÷4c), the beam elements 13 are arranged off-axis and possibly connected by means of suitable brackets 34.

[0088] Fig. 10 shows a column element 35 employed for angled compositions and suitable to allow the height of the top 11 to be varied.

[0089] The column element 35 comprises two tubular profiles 15c, 15d, telescopically associated to each other and on which the plate 16 and the base 17 are respectively attached.

[0090] In an axial position with respect to the outer tubular profile 15d there is a supporting and adjusting

screw 36 onto which an insert 37 is screwed with the function of a guide element, solidly associated with the inner tubular profile 15c.

[0091] The height of the top 11 is varied by making the inner tubular profile 15c rotate in such a manner as to make the insert 37 slide on the supporting and adjusting screw 36.

[0092] Once the desired position has been achieved, the inner tubular profile 15c is clamped with respect to the outer tubular profile 15d by means of a vice mechanism 38.

[0093] According to a variant shown in Fig. 14, at least the tubular profiles 15 defining the uprights 14 of the supporting structure 10 according to the invention are externally screened by covering elements 49 which can be associated and engaged.

[0094] In this case, the covering element 49 shown has an open section substantially semi-elliptical, and is suitable to cover three sides of the tubular profile 15.

[0095] The covering element 49 is made of an at least partly elastic material and can be applied by a partial deformation which allows it to be attached onto the edges of the tubular profile 15.

Claims

1. Supporting structure (10) for tops (11) of tables (12), desks or similar, comprising at least a substantially horizontal beam element (13) associated with vertical uprights (14), wherein both the beam element (13) and the uprights (14) consist of tubular profiles (15), the structure being characterised in that the tubular profiles (15a, 15b) are achieved in a single piece of a desired section and can be associated with each other by means of assembly elements (20) suitable to be inserted and clamped to the ends of at least one (15a) of the tubular profiles, each of the assembly elements (20) including at least an insertion seating (19) suitable to cooperate with corresponding attachment means (18), the attachment means (18) cooperating with insertion means (21) made in at least a second tubular profile (15b).

2. Structure as in Claim 1, characterised in that the assembly elements (20) are arranged substantially in a retracted position inside the relative tubular profiles (15).

3. Structure as in Claim 1, characterised in that the insertion means are through holes (21).

4. Structure as in Claim 1, characterised in that the attachment means (18) are screws.

5. Structure as in any claim hereinbefore, characterised in that the insertion seatings (19) are made in a single piece with the assembly elements (20).

6. Structure as in any claim from 1 to 3 inclusive, characterised in that the insertion seatings (19) are defined by inserts (50) which can be associated with the assembly elements (20).

7. Structure as in any claim hereinbefore, characterised in that the second tubular profile (15b) is internally associated with at least an anti-crushing spacer element (25) clamped in correspondence with the zone where the second tubular profile (15b) is associated with the first tubular profile (15a).

8. Structure as in Claim 7, characterised in that the at least one spacer element (25) includes through holes (24) which can be associated with the insertion means (21) of the second tubular profile (15b).

9. Structure as in any claim hereinbefore, characterised in that the assembly elements (20) and/or the spacer elements (25) include positioning and/or retaining means (22, 31, 26, 42) cooperating with the respective tubular profiles (15) into which they are inserted.

10. Structure as in Claim 9, characterised in that the positioning and/or retaining means (22, 31, 26) engage and cooperate with respective means (23, 32, 27) made on the tubular profiles (15) to clamp the assembly elements (20) and/or spacer elements (25) onto the tubular profiles (15).

11. Structure as in Claim 9, characterised in that the said positioning and/or retaining means (42) cooperate in abutment with the perimeter edge of the tubular profiles (15).

12. Structure as in any claim hereinbefore, characterised in that the assembly elements (20) and/or the spacer elements (25) include elastic means (20b, 20d, 25b) suitable to allow them to contract and be inserted into the respective tubular profiles (15) and then subsequently expand to be clamped inside the tubular profiles (15).

13. Structure as in any claim hereinbefore, characterised in that the assembly elements (20) and/or the spacer elements (25) include screw-in means (29) for mating screw means (39) to clamp the elements (20, 25) to the respective tubular profiles (15).

14. Structure as in any claim hereinbefore, characterised in that the assembly elements (20) and/or the spacer elements (25) include cavities (41, 45) cooperating with mating through holes made on the respective tubular profiles (15), into which clamping pin means are inserted.

15. Structure as in any claim hereinbefore, characterised in that the beam elements (13) and/or the uprights (14) consist of two or more tubular profiles (15) telescopically associated.

16. Structure as in any claim hereinbefore, characterised in that it comprises plates (16) on which the top (11) rests and is associated, attached at the upper part to the uprights (14) or to the beam elements (13) by means of screw elements (40) which can be coupled with seatings (28, 51) made on the spacer elements (25) or the assembly elements (20).

17. Structure as in any claim hereinbefore, characterised in that it comprises bases (17) associated at the lower part with the uprights (14) by means of assembly elements (20) inserted and clamped therein.

18. Structure as in Claim 12, characterised in that the assembly elements (20) are telescopically constrained to the uprights (14) and include a plurality of association positions with respect thereto.

19. Structure as in any claim hereinbefore, characterised in that it provides for two or more beam elements (13) to be associated to the same upright (14) in an off-axis position with respect to the upright (14).

20. Structure as in any claim hereinbefore, characterised in that it comprises assembly profiles (34) cooperating with the assembly elements (20) in the association with the beam elements (13) with the uprights (14).

21. Structure as in any claim hereinbefore, characterised in that it comprises covering elements (49) which can be associated and engaged at least with the uprights (14).

22. Structure as in any claim hereinbefore, characterised in that it comprises column elements (35) to support the top (11) in angled compositions, the column elements (35) comprising two tubular profiles (15b, 15c) telescopically associated with each other, the inner tubular profile (15c) being constrained rotatable with respect to supporting and adjusting screw means (36) solid with the outer tubular profile (15d) to define the height of the top (11).

23. Structure as in Claim 22, characterised in that the inner tubular profile (15c) can be clamped with respect to the outer tubular profile (15d) by means of vice means (38).

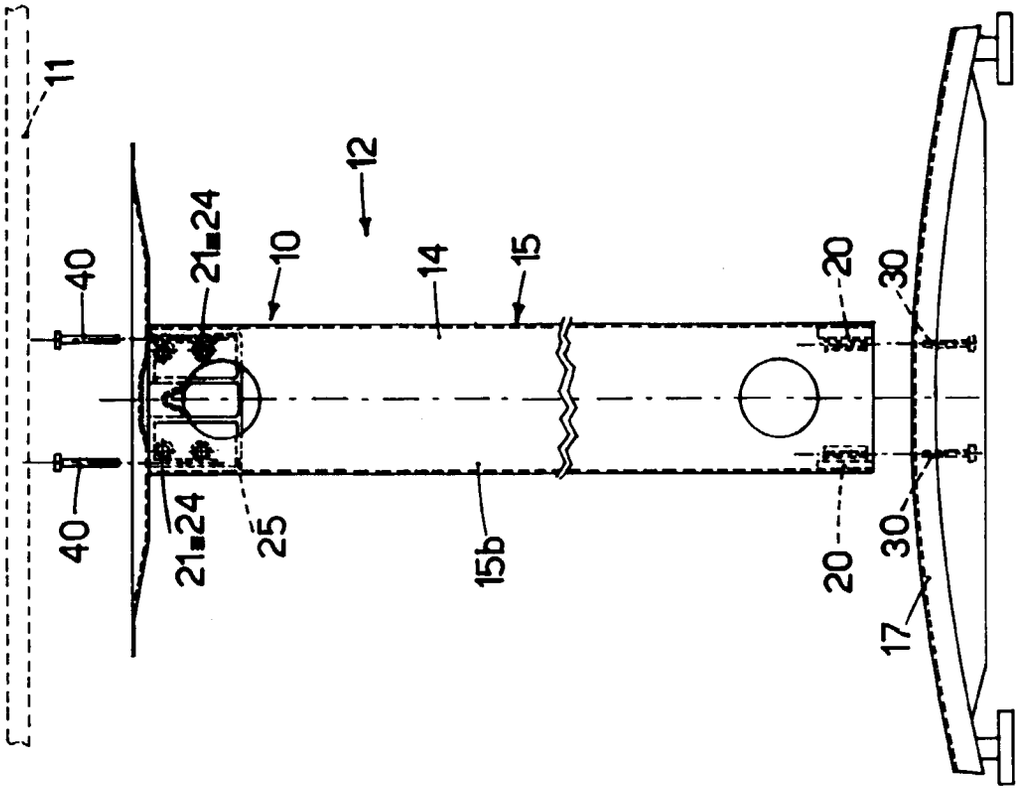
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fig.2

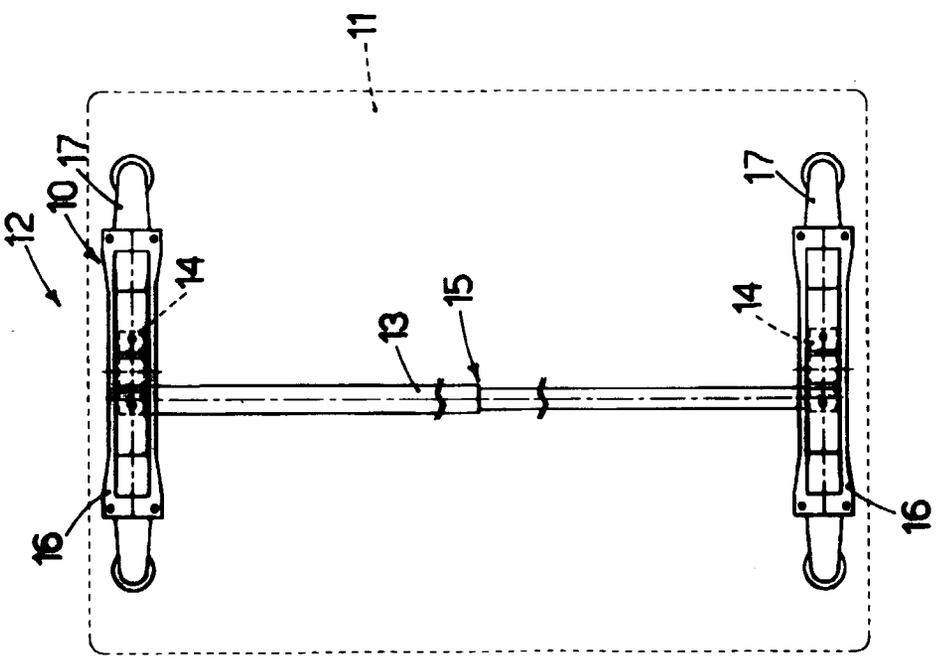
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fig.1

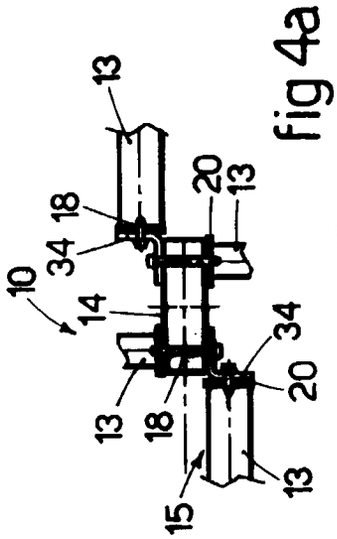


Fig 4a

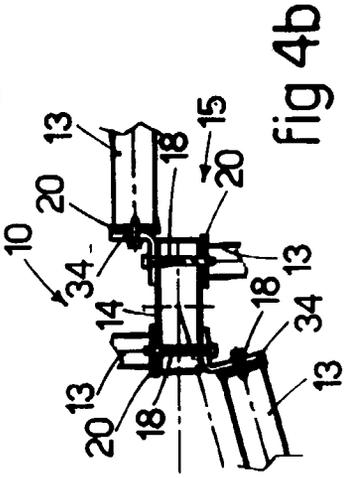


Fig 4b

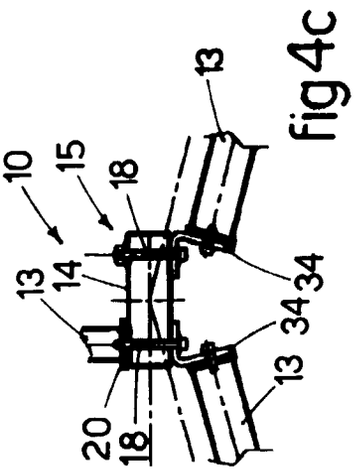


Fig 4c

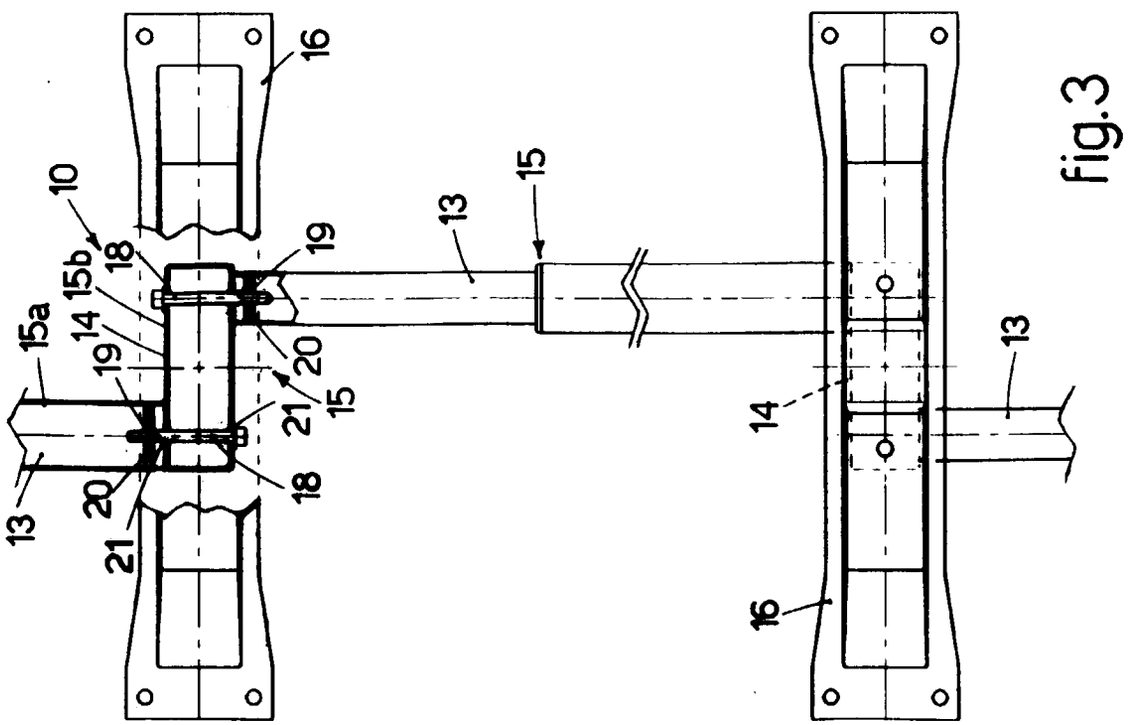


Fig.3

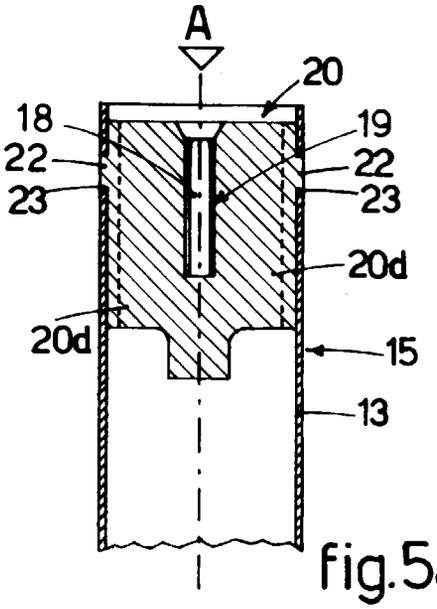


fig.5a

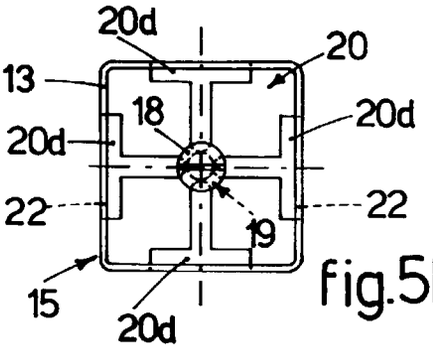


fig.5b

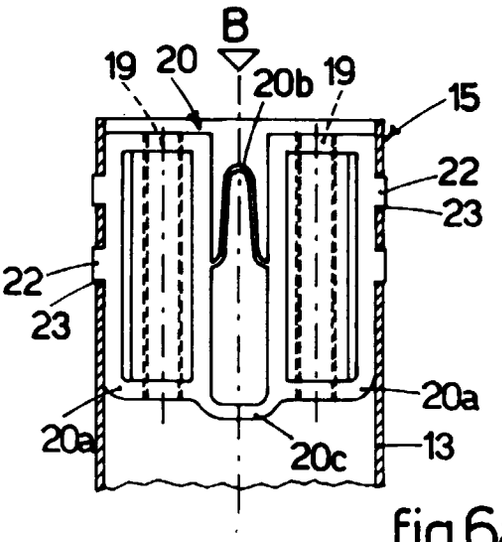


fig.6a

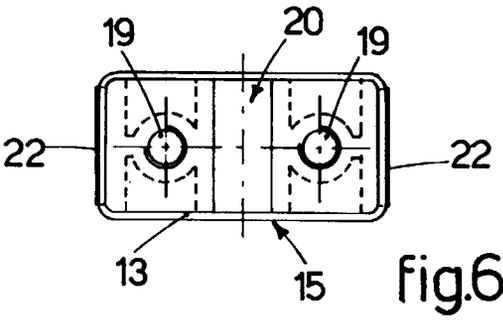
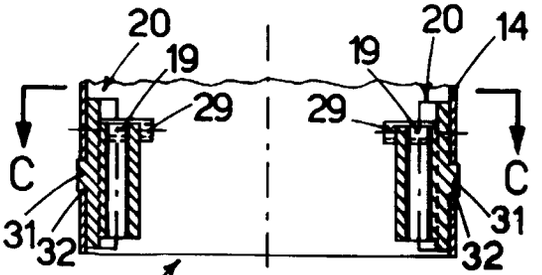


fig.6b



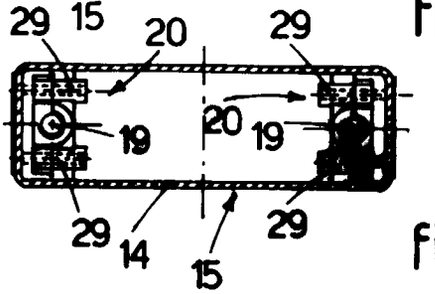


fig.7a fig.7b

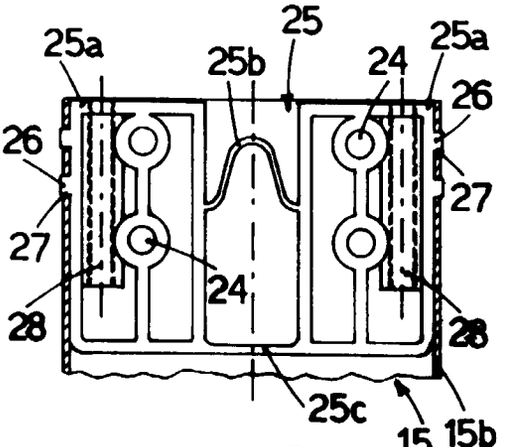


fig.8

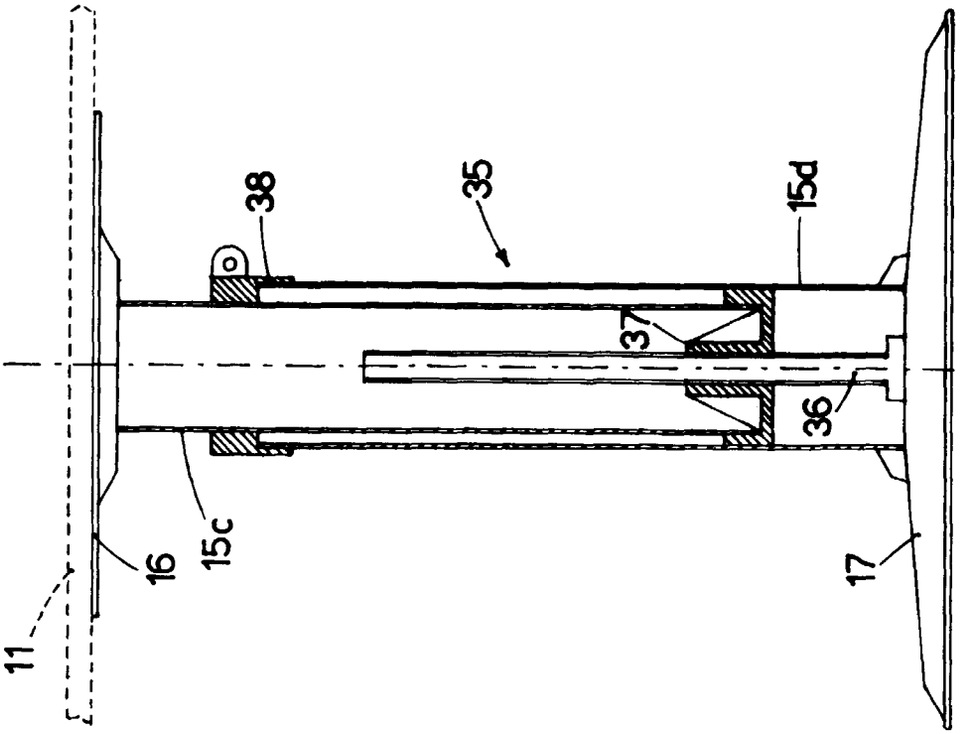


fig.10

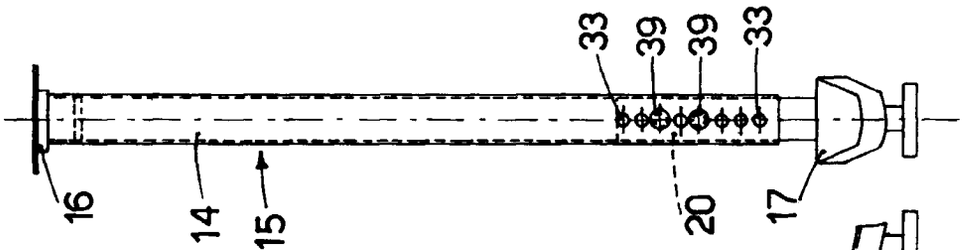


fig.9b

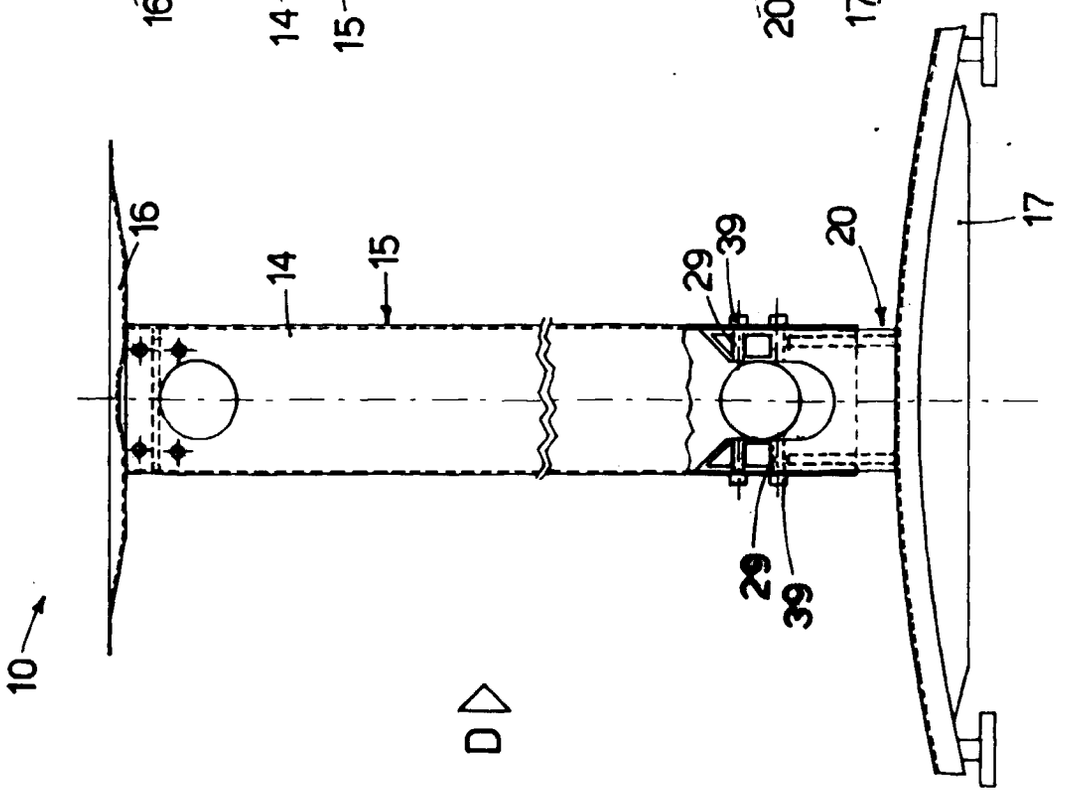


fig.9a

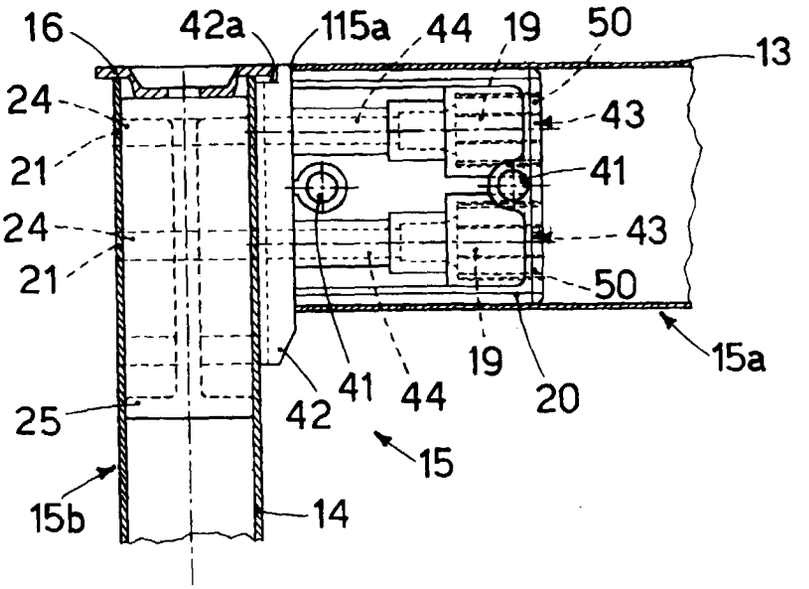


fig.11

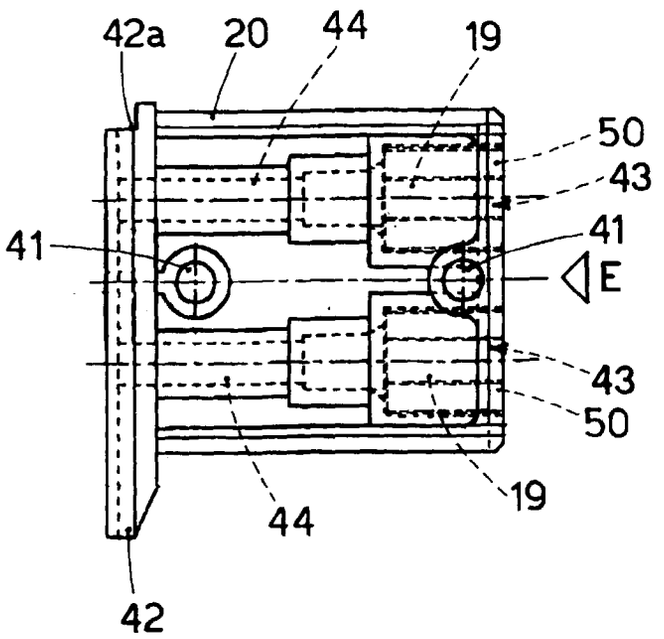


fig.12a

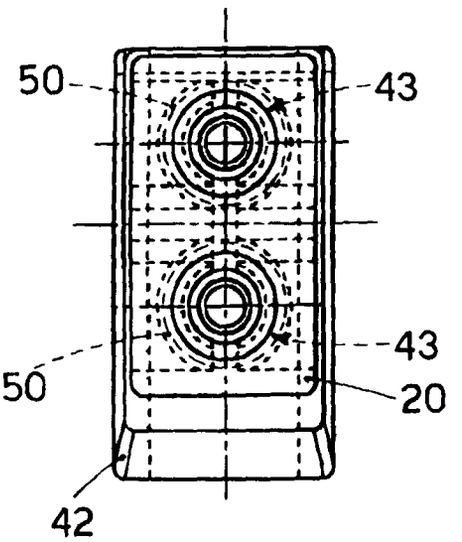


fig.12b

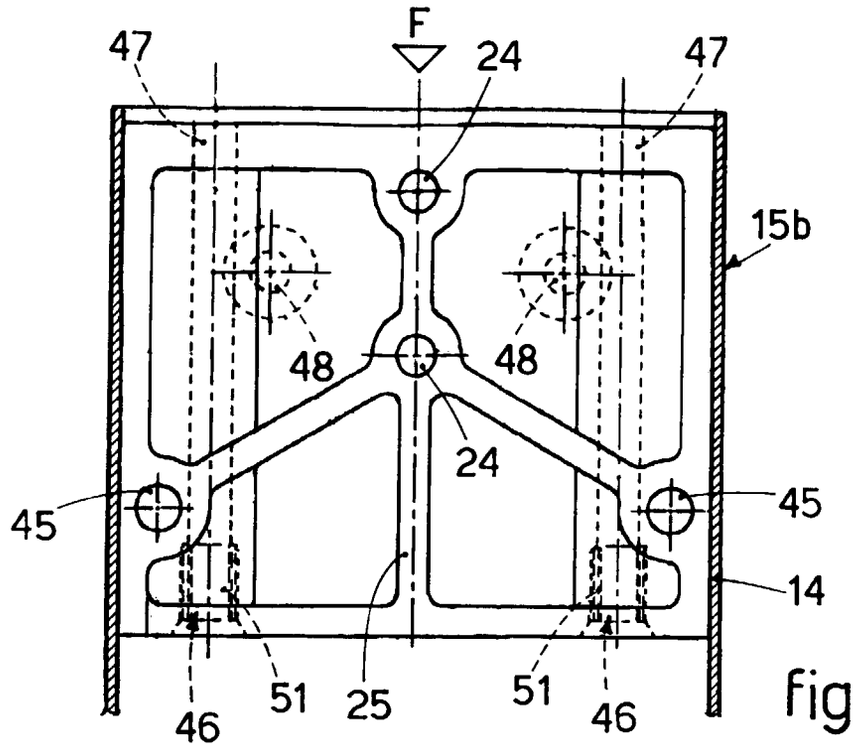


fig.13a

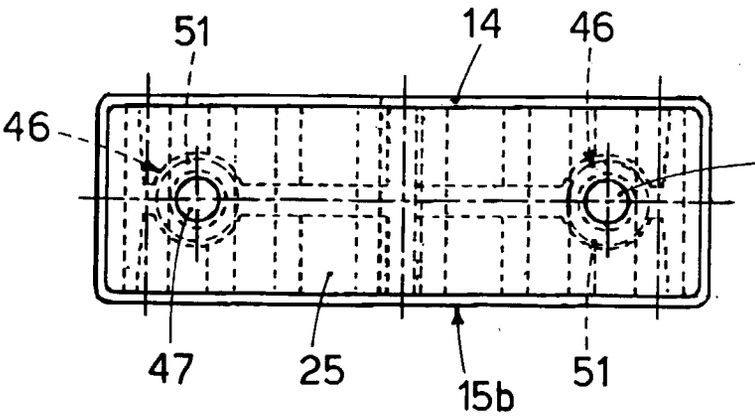


fig.13b

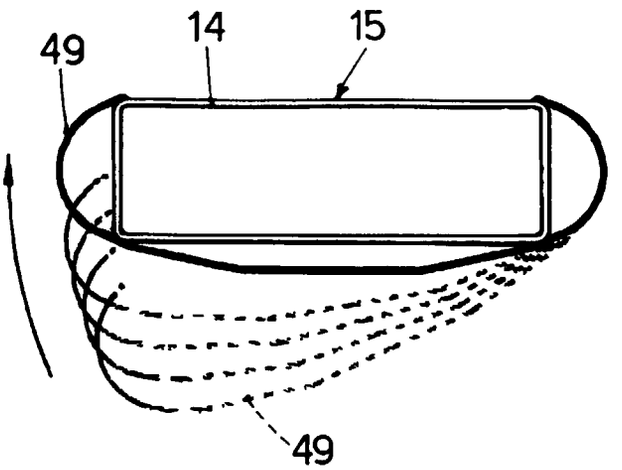


fig.14