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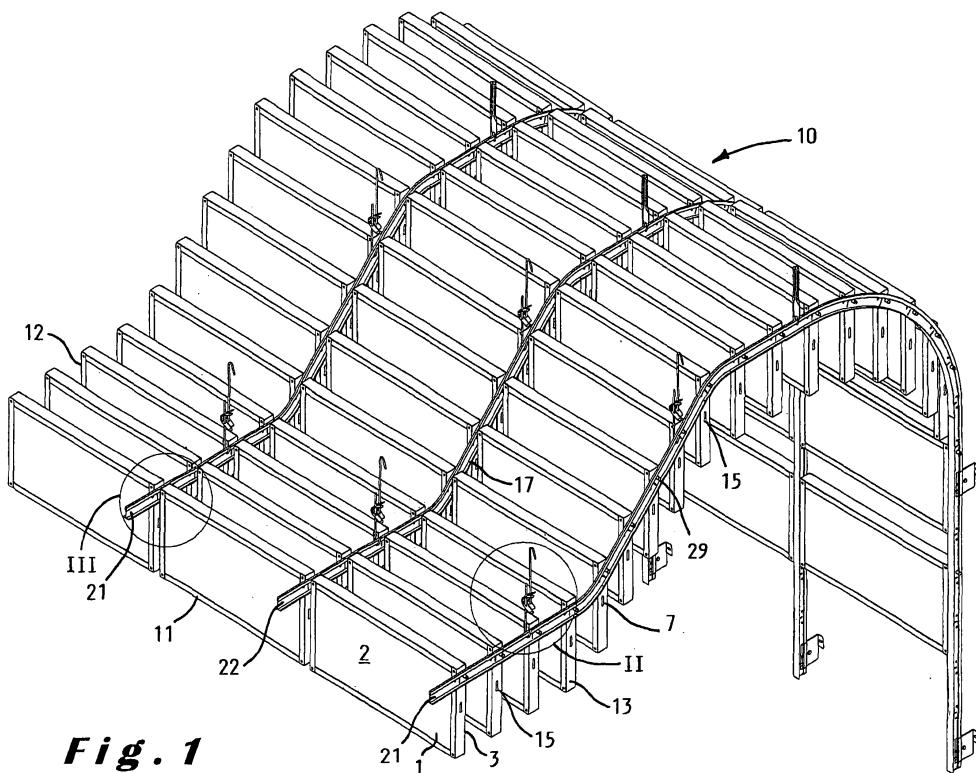
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### (54) Baffle system

(57) The present invention relates to a circumferential frame (39) made of a multiplicity of connectible frame parts, wherein the frame parts are connected to each other by a snap-fit connection provided on an assembly of a first and second frame part engaging one another at

the snap-fit connection. The present invention also relates to a baffle element comprising a panel (38) surrounded by a circumferential frame (39) according to the invention and a baffle system comprising at least one such baffle element.



## Description

**[0001]** The present invention relates to a baffle system comprising a plurality of profiles provided for mounting to a building construction and at least one baffle element provided for mounting to the at least one profile through attachment means provided thereto, as disclosed in the preamble of the first claim.

**[0002]** In DE-A1-4229712 a system is disclosed for absorbing sound in large dimensioned halls. The system comprises a plurality of rows of individual baffle elements, each baffle element having the shape of a plate the opposite faces of which are covered with a sound absorbing material. To improve the sound absorbing properties, the baffle elements extend under an angle of between 15 and 75° with respect to a vertical plane. To achieve such positioning, the top side of each baffle element comprises a hook for attaching the baffle element to a T-profile, which is directly mounted to the building construction, whereas the bottom side is connected to a first end of a tow or cord. The second end of the tow is attached to the T-profile of a subsequent baffle element.

**[0003]** The system of DE-A1-4229712 is most probably designed for use in an industrial environment as it is unattractive from an aesthetic point of view, because of the visible presence of a plurality of hooks and tows or cords. Besides this the system of DE-A1-4229712 presents the disadvantage that the accessibility of the plenum between and above the baffles is difficult and time consuming.

**[0004]** It is therefore the object of the present invention to provide a baffle system which provides for an improved accessibility of the plenum.

**[0005]** This is achieved according to the present invention with the technical features of the characterising portion of the first claim.

**[0006]** Thereto, the baffle system of this invention is **characterised in that** the at least one baffle element comprises a first and a second face and a first and second side, in that the at least one baffle element is provided to be connected to at least a first and a second profile, which extend along each other, the first side of the baffle element facing the first profile, the second side of the baffle element facing the second profile, the first and second profile forming part of a suspension grid. The baffle system of this invention is further **characterised in that** the attachment means comprise first and second attachment means provided on respectively the first and second side of the baffle element and corresponding third and fourth attachment means provided on a side of the corresponding first and second profiles facing the first and second side of the baffle elements, and in that the first and third, respectively the second and fourth attachment means point towards each other sideways of the baffle element and the profiles.

**[0007]** The sideways connection of the baffle element to the facing profile facilitates mounting of the baffle element to the suspension grid and provides the possibility

of rendering the connection almost invisible from a position below the baffle system. Connecting the baffle elements to a building construction through the intervention of a suspension grid, results in a system in which the

5 baffle elements may be suspended at a lowered position with respect to the building construction. Moreover, by attaching the baffle elements to a suspension grid, use can be made of the versatility provided by the suspension grid to build in sound absorption properties. Thus a baffle  
10 system is obtained which combines optimised sound absorption properties with a high versatility, which may contain build-in lightning, cooling or heating systems, electrical provisions, and which shows the pleasant aesthetic appearance provided by the suspension grid. The baffle  
15 system may be integrated in a lowered ceiling construction, in which the baffle elements are mounted at the positions providing the required sound absorbing properties, while the remainder of the system may be formed as a lowered ceiling construction.

**[0008]** In a preferred embodiment the first, second, third and fourth attachment means are provided to attach the at least one baffle element to both the first and second profile in such a way that the baffle element is hinged with respect to the first and second profile. Thereby the

25 first and second profile may for example run parallel, although the first and second profile may also slant with respect to each other or point away from each other. The hinged mounting of the baffle elements not only facilitates their mounting. The hinged mounting also allows mounting

30 a baffle element with its faces extending under any desired angle with respect to the perpendicular, independently of the position and shape of the profile to which the baffle is suspended or the shape of the building construction. The hinged mounting to the suspension grid

35 facilitates access of any plenum above the baffles and the suspension grid and allows adapting the sound absorbing properties of the baffle system to the locally required circumstances: subsequent baffle elements attached to the first and a second profile, may namely extend parallel or perpendicular to each other or slant with respect to each other. In that way any sound which, with parallel extending baffle elements could pass between subsequent elements, can now be absorbed.

**[0009]** A preferred embodiment of the baffle system of  
45 this invention which further facilitates mounting of the baffle elements to the suspension grid, is characterised in that the first and second attachment means comprise a (i) first recess provided in the first side of the baffle element, (ii) a second recess provided in the second side

50 of the baffle element, (iii) a third and a fourth recess provided in respectively the first and second profile, (iv) at least one first pin provided to be received in both the first and the at least one third recess and (v) at least one second pin provided to be received in both the second and the least one fourth recess.

**[0010]** A practical embodiment of the fastening means is **characterised in that** the at least one third recess in the profile extends throughout the thickness of the profile

in a connection direction of the baffle element and the profile. Preferably also the at least one fourth recess extends throughout the thickness of the profile in a connection direction of the baffle element and the profile. Together with a pin comprising a first and a second pin part which are removably connectible to each other through the third respectively fourth recess, mounting of the baffle elements is significantly facilitated. The first pin part is provided for mounting to a first side of the profile, the second pin part is provided for mounting to a second side of the profile, the first and second pin part being provided to be connected to each other. After connecting the first and second pin part, either the first or second pin part is received in the first or second recess in the first or second side of the baffle element to hingedly mount the baffle element to the profile. With the part of the profile which contains the recess made of a double folded sheet of material, a so-called double web for example made of metal, a tension is exerted to the first and second pin part as a consequence of which a sturdy connection between the first and second pin part is obtained.

**[0011]** Another preferred embodiment of this invention is **characterised in that** the baffle system comprises a plurality of first and second, profiles which extend at a first level with respect to the building construction and a plurality of third and fourth profiles which extend at a second level with respect to the building construction different from the first level. This embodiment is further **characterised in that** the baffle element comprises on respectively the first and second side, fifth and sixth attachment means which are shifted with respect to respectively the first and second attachment means in height direction of the respective sides of the baffle element, the first and third attachment means being provided for attachment to either the first or second profile, the second and fourth attachment means being provided for no attachment or for attachment to the third and fourth profile. With this embodiment the baffle elements may be mounted at different levels with respect to the building construction. With this embodiment also the baffle element may be attached to a profile at two positions, so that an improved fixation of the position of the baffle elements may be provided. This may be required when there is a need to adapt the sound absorbing properties provided by the baffle system to the local circumstances, to situations where there is a virtually permanent circulation of air or to create a baffle system with an aesthetically pleasing appearance. Of course each side of the baffle element may contain a plurality of, i.e. more than two, of the above described attachment means for attachment to the suspension grid.

**[0012]** In case it is desirable to optionally changing the direction in which the baffle elements extend after they have been mounted to the suspension grid, the baffle system of this invention is **characterised in that** the third and fourth profiles are moveably mounted with respect to respectively the first and second profiles in longitudinal direction of the profiles.

**[0013]** A baffle system in which baffle elements extend in longitudinal as well as in transverse direction or any direction in between, is obtained by a system which is characterised by a suspension grid comprising a plurality of profiles extending in longitudinal direction and a plurality of profiles extending in transverse direction of the suspension grid, a transverse profile connecting adjacent longitudinal profiles. These transverse profiles may extend at the level of the first and second profiles, or the level of the third and fourth profiles or both, or at any other level which might be imposed by the circumstances.

**[0014]** An additional embodiment of the baffle system of this invention is **characterised in that** the at least one baffle element is removable mountable to the suspension grid, in view of improving the accessibility of the plenum behind or above the baffle system.

**[0015]** A baffle system which is characterised by the presence of a plurality of parallel first profiles which extend parallel to, perpendicular to or slant with respect to a level of the building construction or a combination of two or more of those first profiles, may be used in a wide diversity of applications. Such a baffle system may for example be used as a sun screen having acoustic isolating properties.

**[0016]** The present invention also relates to a baffle element for use in the above described baffle system.

**[0017]** The invention is further elucidated in the pending figures and description of the figures

**[0018]** Figure 1 is a view of an embodiment of the baffle system of this invention, the baffle elements being mounted at several levels.

**[0019]** Figure 2 and 3 show enlarged parts II and III of figure 1, i.e. the connection of a baffle element of this invention to a suspension grid.

**[0020]** Figure 4 shows an embodiment of the baffle system of this invention in which the baffle elements extend in different directions and at different levels.

**[0021]** Figure 5 shows an embodiment of the baffle system of this invention in which the baffle elements extend in different directions, of which Fig. 5a shows a view to the top; Fig. 5b shows a perspective view; Fig. 5c shows a front view.

**[0022]** Figure 6 shows a vertically mounted baffle system.

**[0023]** Figure 7 is a view to an embodiment of a baffle element of this invention, with taken apart parts.

**[0024]** Figure 8 is a detailed view to the connection of the baffle element of this invention and the suspension grid.

**[0025]** The embodiment of the baffle system 10 of this invention shown in figure 1 comprises a plurality of individual baffle elements 1, 11 suspended to a suspension grid. In figure 1 the suspension grid is suspended to a ceiling. It is however also possible to suspend the suspension grid to a vertical wall, in front of a window where the baffle system will function as a sun screen, to use the suspension grid as an independently standing con-

struction forming a separation or a moveable partition, or in the form of a partition (figure 6).

**[0026]** The suspension grid of this invention comprises a plurality of profiles 21-25, which may extend in any direction implied by the circumstances in which the baffle system 10 is to be used (figure 1). As can be seen from figure 1, the suspension grid may comprise a plurality of profiles 21-24 which extend in longitudinal direction along a ceiling of the building construction and run parallel to each other. It is however also possible that two or more profiles do not run parallel and that the distance between opposite profiles increases from a first point to a second point, that two or more profiles do not run parallel to the ceiling, that two or more profiles extend virtually perpendicular to the ceiling or in any other direction required by the circumstances in which the baffle system is to be used. Longitudinally extending profiles 21-24 may be connected by transverse profiles 25 at one or more positions, in case it is desirable that the baffle elements 1, 11 point in several directions, or where it is the intention to use the baffle system as a suspended ceiling, with a multiplicity of baffle elements supported by the profiles. Usually profiles 21-25 will be mounted in such a way as to take account of the intended use. The suspension grid shown in figure 1 comprises a plurality of first and second profiles 21, 22 which extend at a single, first level. The suspension grid may however also comprise third and fourth profiles 23, 24 which extend at a second level different from the first level, to provide particular sound absorbing properties or a particular aesthetic effect as is shown in figure 4. When required by the circumstances profiles extending at still other levels may be present. The position of both the first and second profile 21, 22 with respect to both the third and fourth profile 23, 24 may be fixed. It is however also possible that the suspension grid comprises means for having the third and fourth profile 23, 24 displaceable with respect to the first and second profile 21, 22 either in longitudinal direction of the profiles or in height direction thereof. Thus a baffle system with a large versatility is provided.

**[0027]** The baffle system 10 of the present invention comprises at least one, preferably a plurality of baffle elements 1, 11. The embodiment of the baffle element 1, 11 shown in figure 7 comprises a first and second opposite face 2, 3 and a first and second side 12, 13. The shape of the baffle element is not critical to the invention. The baffle system of this invention is suitable for use with baffle elements having any shapes ought suitable by the person skilled in the art. The person skilled in the art has the option of building the baffle system in which all baffle elements have the same or varying shapes. All baffle elements may have the same or different dimensions. The baffle element 1, 11 may for example be substantially beam shaped, the first and second face being either square shaped, rectangular or triangular, the baffle element 1, 11 may also take the shape of a pyramid - in which case the first attachment means 4 will for example be provided on a first face of the pyramid,

the second attachment means 5 being provided on an edge of the pyramid opposite the first face 2 - or the shape of an octagon or any other shape.

**[0028]** The first side 12 of the baffle element 1, 11 comprises first attachment means 4 for connecting it to a first side 31 of the first profile 21 which extends at a first level with respect to the building construction. The first side 12 of the baffle element may however also comprise fifth attachment means 14, the first and fifth attachment means 4, 14 being spaced from each other in height direction of the baffle element 1, 11. The fifth attachment means 14 function to connect the baffle element to either a first profile 21, or to a third profile 23 which extends at a different level with respect to the building construction. The second side 13 of the baffle element comprises second attachment means 5 for connecting it to a second side 32 of a second profile 22. The second side 3 of the baffle element may however also comprise sixth attachment means 15 for connecting it to a fourth profile 24, the fourth profile 24 extending at a different level with respect to the building construction as compared to the first profile 21. Thereby the first side 12 of the baffle element 1, is provided to face the first side 31 of the first and/or third profile 21, the second side 3 of the baffle element 1 being provided to face the second side 32 of a second and/or fourth profile 22 which runs virtually parallel to the first profile. The first and second profile may extend with respect to each other under any other angle which is different from 0° or 180°. It is further possible to connect the first attachment means 4 of a baffle element 1 to a first profile 21, and to connect the second attachment means 5 to a second profile 22 or a fourth profile 24, or the reverse. It is also possible to connect both the first and second attachment means 4, 5 to respectively the first and second profile 21, 22, or to respectively the third and fourth profile 23, 24. Any other variation is however also possible. All sides 12, 13 of a baffle element may contain the same or a different number of attachment means, mounted at regular or varying distance from each other. The number of attachment means provided on any side may vary from one to any other suitable number. **[0029]** The first, second, fifth and sixth attachment means 4, 5, 14, 15 may be provided in two opposite longitudinal sides of a baffle element, in two transverse sides of a baffle element or in both. Thus the possibility is provided of mounting a baffle element in any desired direction. The attachment means may be countersunk in one or more sides of the baffle element or protrude therefrom, although a combination of both is also possible. The attachment means may however also be provided in or protrude from one or more edges of the baffle element 1, 11 for example with a pyramidal shaped baffle element or with very thin sides. **[0030]** The way in which the baffle element 1, 11 of this invention is constructed is not critical to the invention. The embodiment of the baffle element 1, 11 shown in figure 7 comprises a virtually central panel 38, which may be made of any material ought suitable by the person

skilled in the art, but which is preferably made of a sound absorbing material. The panel 38 is surrounded by a frame 39 made of a multiplicity of connectible frame parts in view of facilitating construction. The frame parts may also be made of any material ought suitable by the person skilled in the art, for example a plastic material or metal. In that case the first, second, fifth and sixth attachment means 4, 5, 14, 15 will usually comprise a hole in the frame, which may extend into the panel part 38 or not, the hole being surrounded by a thin edge formed by the frame. The baffle element 1, 11 may also be made of metal sheet, which may take any desired form. To create an aesthetically attractive appearance in view of hiding the building construction, the baffle element may be made of a sheet with an upper and lower side, which are fixed to each other on at least one position by means of a cord. In case of baffle elements having a large length, the interior of the baffle element may be reinforced along its bottom.

**[0031]** The attachment means for connecting the at least one baffle element to the suspension grid extend between the side 2, 3 of the baffle element and the side of the profile 21-24 facing the baffle element to which the latter is to be attached. This sideways extension allows achieving a connection which is hardly visible from a position below the baffle system 10, in particular when use is made of a profile having a bottom face which is dimensioned to fill the gap between adjacent baffle elements 1 as is shown in figure 1.

**[0032]** The attachment means 4-7, 14, 15 may comprise any suitable sideways extending attachment means known to the person skilled in the art. The first and second attachment means 4, 5 may for example comprise

- At least one recess provided in the frame 39 forming the first and second side 12, 13 of the baffle element 1, 11 as is described above;
- corresponding recesses, for example third and fourth recess 6, 7 in the profiles 21-24 to which the baffle element is to be connected. Thereby the recesses 6, 7 will be provided such that they point towards the corresponding side 12, 13 of the baffle element. The third and fourth recess 6, 7 may extend through the thickness of the profile or for example take the shape of a hollow cylinder protruding from the sides 31, 32 of the profile.
- Usually each profile 21-25 will comprise a plurality of attachment means or recesses 6, 7 spaced from each other in longitudinal direction of the profile. This allows mounting a multiplicity of consecutive baffle elements 1, 11 to a single profile. Thereby the attachment means may occur at regular distances or not. Each profile 21-25 may also comprise a plurality of attachment means in height direction of the profile.

**[0033]** In a preferred embodiment, the attachment means further comprise at least one pin 19, 29. The pin

is provided to extend throughout recess 6, 7 in the profile 21-24, into a first recess 4 of a first 12 side of a first baffle element 1 and into a second recess 5 of a second side 13 of a second facing baffle element 11. It is possible to use a pin 19, 29 which is rotatable with respect to the corresponding profile, to provide the hinged connection. It is also possible to use a pin 19, 29 which may be fixed to the profile 21-25, the baffle element 1, 11 being hinged with respect to the pin 19, 29. It is further possible to use a combination of both.

**[0034]** The first, second, fifth and sixth attachment means 4, 5, 14, 15 on the baffle element 1, 11 may comprise a recess in the sides of the baffle element, having a substantially circular shape, for use with a substantially cylindrical pin. However any other shape ought suitable by the person skilled in the art may also be used. Thereby the shape and dimensions of the recess will usually be adapted to the shape and dimensions of the pin to be inserted therein. It is however also possible that the first, second, fifth and sixth attachment means 4, 5, 14, 15 have an elongated shape with a rounded end part, to facilitate insertion of the pin 19, 29. It is furthermore possible that the first, second, fifth and sixth attachment means 4, 5, 14, 15, are cross-shaped with rounded end parts (figure 7). With this type of attachment means suspension of the baffle element 1, 11 to the pin is facilitated as the cross shaped recess has a central hole with a relatively large diameter which facilitates insertion of the pin in the central recess and contributes to the ease of removing the baffle element from the system when necessary. Following insertion the baffle element may suspend from the pin due to gravitational forces, in that case the top edge of the recess will be suspended to the pin 19, 29. By adapting the diameter of the rounded recess such that it is somewhat smaller than the diameter of the pin, the baffle element may be completely locked in vertical position and displacement of the baffle element in vertical direction is limited to the dimensions of the recess. The presence of the cross shaped recess allows positioning the baffle element 1, 11 in any desired position, i.e. suspending substantially vertical from the suspension grid, in a suspending or upstanding position, or extending substantially horizontal with respect to the suspension grid. In case the baffle element comprises two recesses on the same side, the horizontal position of the baffle element may be fixed with respect to the suspension grid by suspending both recesses to a suspension pin 19. To fix the position of the baffle element 1, 11 on the pin 19, 29 and facilitate rotation of the baffle element with respect to the pin, without this involving that the baffle element leaves the pin, an end part of the pin may comprise at least one circumferential groove 40 which is provided to receive an edge of the recess 4, 5, 14, 15 provided in the sides of the baffle element 1, 11 or an edged formed by the frame surrounding the baffle element and comprising the recesses (fig. 7). If so desired, a multiplicity of consecutive grooves may be provided along the length of the pin. The dimensions of the recesses 4, 5,

14, 15 will preferably be chosen such that they are hidden by the profiles 21-25.

**[0035]** In a preferred embodiment the circumferential groove 40 is substantially V-shaped, both faces of the V extending under an angle of preferably 90° to allow mounting adjacent baffle elements 1, 11 in a herringbone arrangement as is shown in figure 5.

**[0036]** The preferred embodiment in which the baffle element 1, 11 is removably connectible to the suspension grid 21-25 and may be fixed in a specific angle with respect to the suspension grid, may be achieved by using a pin made of a first and a second pin part 8, 18, a part of which extends through the recess 6, 7 in the profile 21-25, the first and second pin part 8, 18 being removably connectible to each other. Simple connection of the baffle element 1, 11 to the suspension grid may be achieved by first fastening the first and second pin part to each other, each pin part being mounted to the appropriate side of a profile 21-25, and thereafter suspending the baffle element 1, 11 to the pin 19, 29. The result is a baffle system which provides for an easy mounting of the baffle elements, in which the baffle elements 1, 11 may hinge with respect to the suspension grid, and in which baffle elements may be mounted side by side. The pin parts 8, 18 may have the same or a different length. The length of the pin parts are not critical to the invention, but will usually be selected taking account of the envisaged positioning of the baffle element mounted thereon. For example a pin part with a longer length will be required in case the side 12, 13 of the baffle element points away from the profile to which it is fastened and extends under an angle with respect to the profile. For aesthetic reasons the length of each pin part 8, 18 will be chosen such that it is not visible from below, or in other words the length of each pin part will be chosen such that it is hidden by the bottom part of the profile. It is however also possible to use attachment means which allow mounting a baffle element under a specific angle with respect to the corresponding first and second or third and fourth profile.

**[0037]** With a suspension grid comprising first and second profiles 21, 22 and third and fourth profiles 23, 24, which extend at different levels of the suspension grid, the position of the baffle elements with respect to the suspension grid may be fixed by attaching the first and second attachment means 4, 5 to the first and second profile 21, 22 and the fifth and sixth attachment means 14, 15 to the third and fourth profile 23, 24. This fixed positioning is particularly useful in a situation where a permanent circulation of air might impart a permanent clinging of the baffle elements, or in a situation where it is desirable to fix the position of the baffle elements independently of the shape of the ceiling to achieve optimum sound absorption, if so desired combined with optimum aesthetic effect. By having one or both of the third and fourth profile 23, 24 displaceable with respect to one or both of the first and second profile 21, 22, the position of the baffle elements may be changed all together if so desired (figure 4). It is also possible to have the first and

second profile 21, 22 displaceable with respect to the third and fourth profile 23, 24.

**[0038]** The profiles 21-25 used in the baffle system 10 of this invention may be any profiles known to the person skilled in the art. To achieve the highest possible versatility, the profiles 21-25 form part of a suspension grid, which is suspended to the building construction. The profiles 21-25 may be mounted either to a ceiling, one or more walls, or may form a separate standing grid as is shown in figure 6. Such profiles are usually available in widely varying designs. They may be suspended to the building construction using standard suspension means, they are available in one or more standard sizes, having recesses 6, 7 at pre-set distances from each other. It is also possible to use as a suspension grid a bandraster system. The preferred profile for use with the baffle system of this invention is a profile which is made of one part, as in that case the vertical part of the profile containing the attachment means is a so-called double web system.

**[0039]** With a suspension grid comprising profiles extending at different levels, that are displaceable with respect to each other, in longitudinal, transversal or height direction of the profile, a wide variety of mounting possibilities for the baffle elements is provided. For example, with a slanting ceiling, the baffle elements 1, 11 may depend vertically from the ceiling, by having the baffle elements suspended through either the first and second attachment means 4, 5 or the fifth and sixth attachment means 14, 15 or a combination of both. The baffle elements 1, 11 may however also be fixed in an angle of 90° or any other value with respect to the ceiling. The baffle elements may also be grouped in so-called islands, where a first group of baffle elements 1 extends under a first angle and a second group of baffle elements 11, extends under a second angle with respect to the ceiling (figure 5). Thereby the first and second angle may be different from each other. It is furthermore possible that the third and fourth profiles are displaceable with respect to the first and second profiles in longitudinal direction of the profiles. As can be seen from figure 5, baffle elements may extend parallel to the longitudinal direction of the profiles, in which case the baffle system functions as a ceiling. As can be further seen from figure 5, baffle elements may be mounted in islands, a first island 30 comprising one or a plurality of vertically depending baffle elements, a second island comprising one or a plurality of horizontal baffle elements 33, a third island comprising a plurality of baffle elements which slant in a first direction, a fourth island comprising a plurality of baffle elements which slant in a second direction, a sixth island 36 comprising a plurality of baffle elements depending in cross direction. However any other mounting may be chosen if the circumstances so require. Figure 5B shows that a multiplicity of baffle elements mounted to the same first and second profile may take various positions.

**[0040]** With the present invention a baffle system is provided which shows a high versatility, the construction

and sound absorbing properties of which are easily adaptable to the local circumstances. The high versatility is attributed to the incorporation of a suspension grid to which the baffle elements are to be suspended, the suspension grid being indirectly mounted to the building construction by means of suspension hangers. A suspension grid is in general used in the construction of suspended ceiling systems, to which rather light weight ceiling tiles are mounted. In the present invention however, the suspension grid is used as an attachment system for mounting the baffle elements, which besides an aesthetic effect have the functional effect of providing sound absorption. Nevertheless, the suspension system may locally still be used to construct a local suspended ceiling. Besides the sound absorbing function, the baffle system may include all further elements which normally are associated with a suspended ceiling, such as lightning, electricity, air-conditioning devices, partitions, whereby the suspended ceiling may extend at different levels with respect to the building construction. At the position where a regular suspended ceiling is to be provided, the usual profiles for constructing a suspended ceiling may be used. Besides this, the application of the baffle system of this invention is not limited to a system which should suspend from a ceiling, as it may also be mounted to a vertical wall, to a wall extending in any other direction, along windows etc. Besides this it may also be used as an independently standing construction. The above described baffle system is suitable for use with a suspension grid which may or may not follow the shape of the ceiling.

**[0041]** The hinged mounting of the baffle elements, and the individual attachment of each baffle element to the suspension grid facilitates accessibility of the plenum above the baffle system. In the known baffle systems, consecutive baffle elements are interconnected, as a consequence of which a multiplicity of baffle elements must be disconnected to gain access to the plenum. The hinged connection allows a direct mounting of the baffle elements to the suspension grid, thus minimizing the number of interfering components. The hinged connection contributes to improving the sound absorbing properties of the baffle system as the baffle elements may be mounted and fixed such that they extend in any required direction.

**[0042]** The above described properties are illustrated in figure 1, where a number of baffle elements 1 extend virtually parallel and depend in height direction from a suspension grid suspended to the ceiling of a building construction. By varying the shape of the profiles 21-25, the shape of the plane formed by the bottom sides 26 of the baffle elements 1 may be varied. The profiles 21-25 preferably form part of a suspension grid which is adapted to accommodate lightning, electrical appliances, aeration equipment or any other equipment between the baffle elements 1. The baffle system 10 of the present invention may have a regular shape, which means that the bottom faces 26 of the baffle elements 1, 11 run for example virtually horizontal, parallel to the ceiling, parallel to the

floor, slant with respect to the ceiling or with respect to any other wall of a building construction. It is further possible that the opposite first and second sides 12, 13 of a baffle element 1, 11 extend in line or not. This may for example be achieved with a baffle element opposite sides of which are connected to opposite profiles at positions which are shifted with respect to each other in longitudinal direction (figure 5). The person skilled in the art thus has the choice to attach a baffle element to a suspension grid such that it depends vertically therefrom. It is however also possible to vary the position of the baffle element in three dimensions as has been described above. The baffle system 10 of this invention may also have an irregular shape and contain substantially horizontal and substantially vertical extending profiles, bent profiles or profiles formed in any other desired shape and extending in any desired direction. Thus the baffle system of this invention may be designed to take an aesthetically attractive shape, without this going at the expense of possible sound absorbing properties provided by it. For example the baffle element may be made of a sheet with an upper and lower side, which are fixed to each other on at least one position by means of a cord. **[0043]** Thus, with the present invention, a baffle system with a high versatility is provided. **[0044]** The present invention also relates to a baffle element as part of the above described baffle system.

### 30 Claims

1. A circumferential frame (39) made of a multiplicity of connectible frame parts, **characterized in that** the frame parts are connected to each other by a snap-fit connection provided on an assembly of a first and second frame part engaging one another at the snap-fit connection.
2. A frame according to claim 1, **characterized in that** the snap-fit connection is in the form of a protrusion/hole assembly provided on the assembly of the first and second frame part.
3. A frame (39) according to any one of claims 1 - 2, **characterized in that** the first part engages the second part by enclosing at least part of it.
4. A frame (39) according to any one of claims 1 - 3, **characterized in that** the frame parts have a substantially U-shaped cross-section with a base flange and a first and a second upward flange extending from opposing sides of the base flange.
5. A frame (39) according to claim 4, **characterized in that** the snap-fit connection is provided on the first and/or the second upward flange of the frame parts.
6. A frame (39) according to any one of claims 1 - 5,

**characterized in that** the first part is substantially linear and the second frame part has the form of a corner piece.

7. A frame (39) according to any one of claims 2 - 6, 5  
**characterized in that** the protrusion is provided on the second frame part and the hole is provided on the first frame part.
8. A baffle element (1, 11) comprising a panel (38) surrounded by a circumferential frame (39) as claimed in any one of claims 1 - 8. 10
9. A baffle system comprising at least one baffle element according to claim 8. 15

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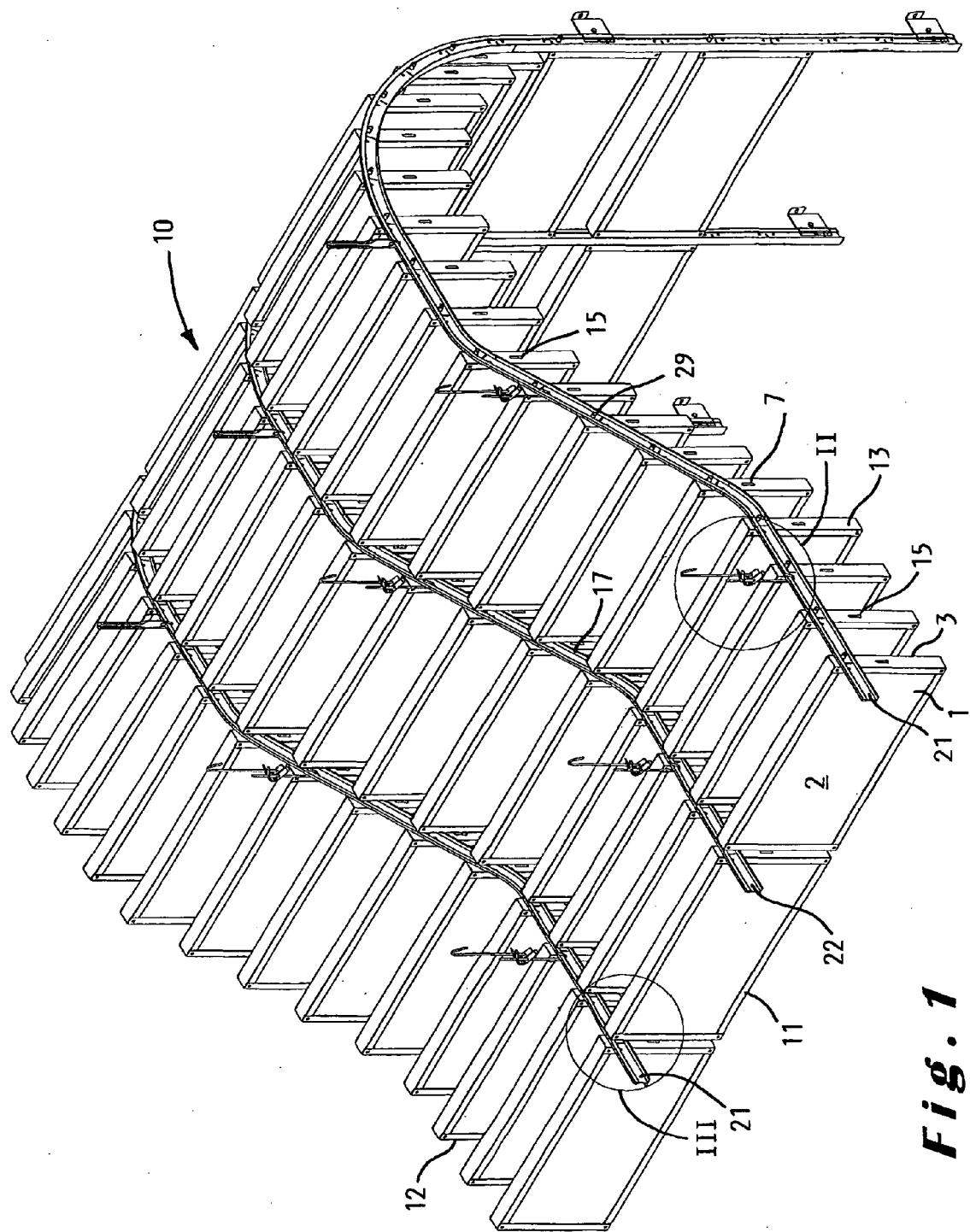
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*Fig. 1*

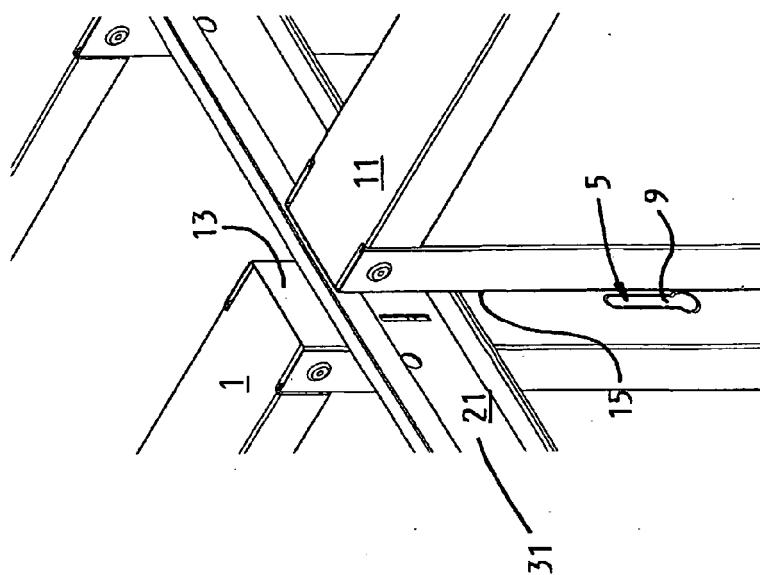


Fig. 3

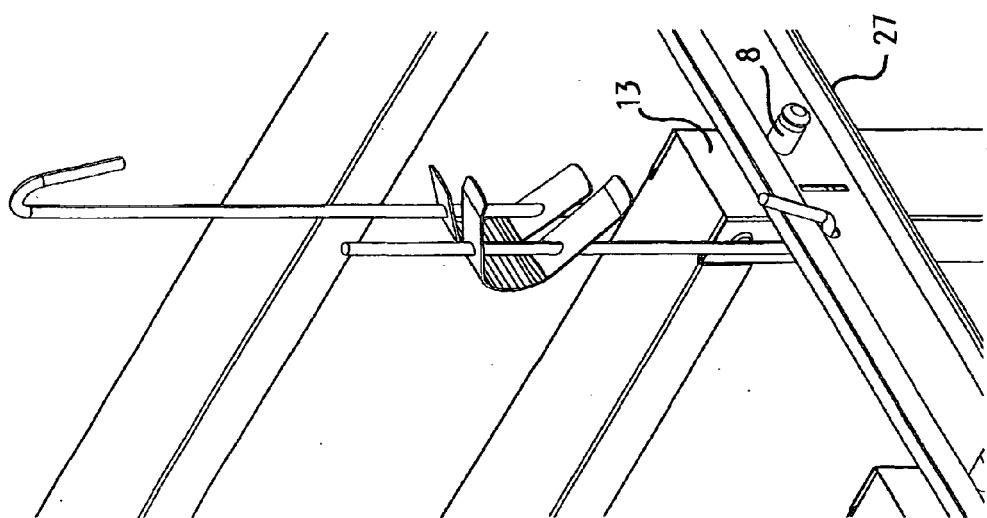
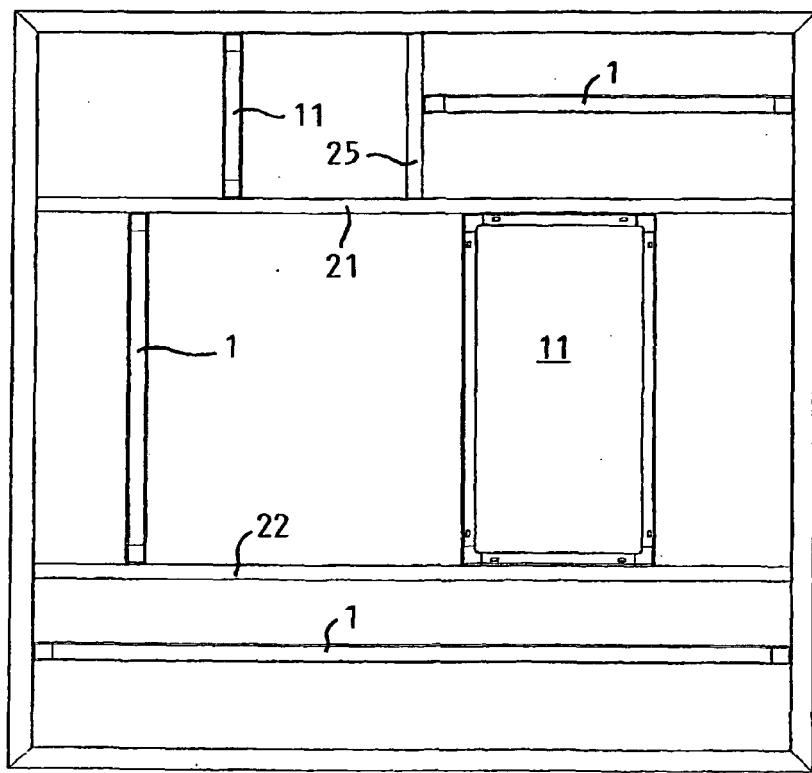
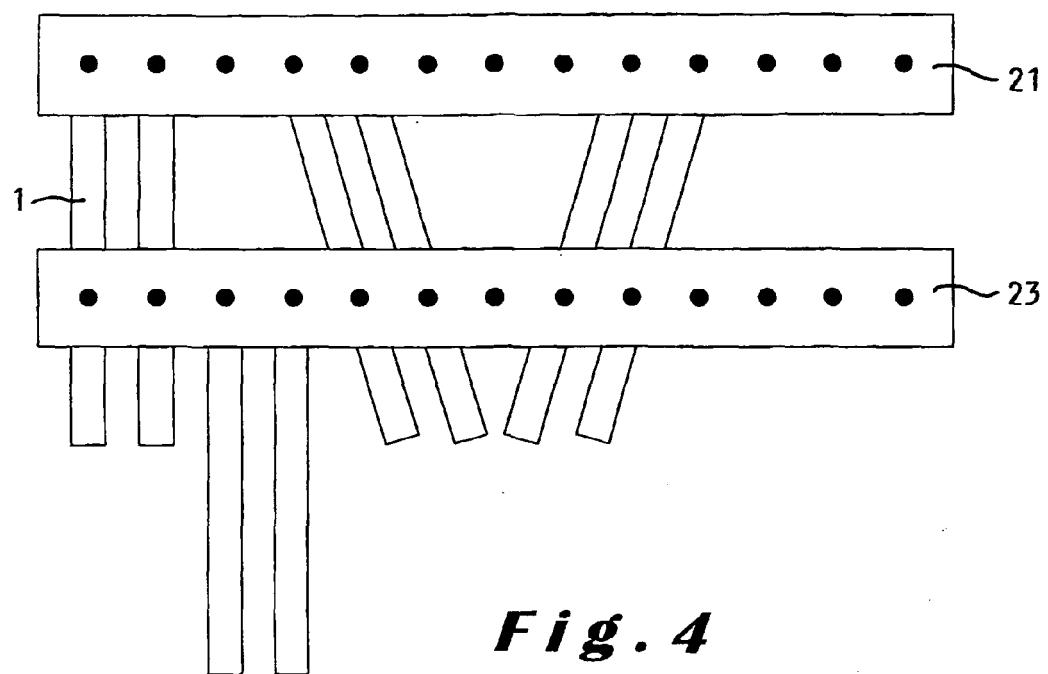
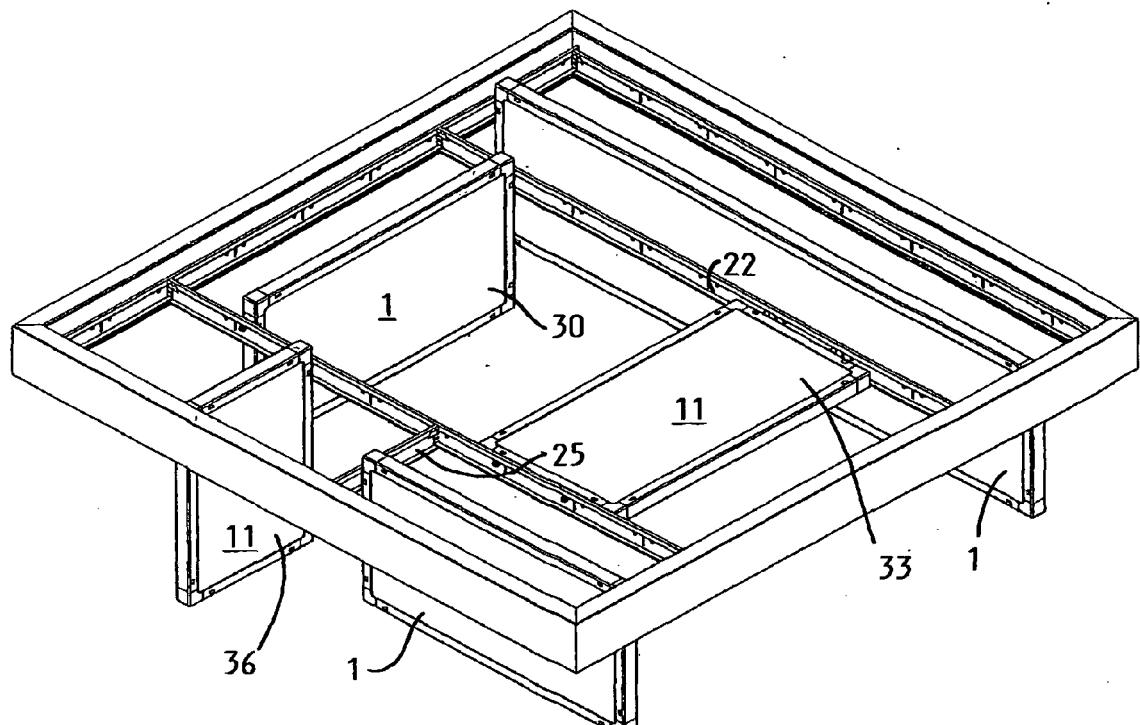
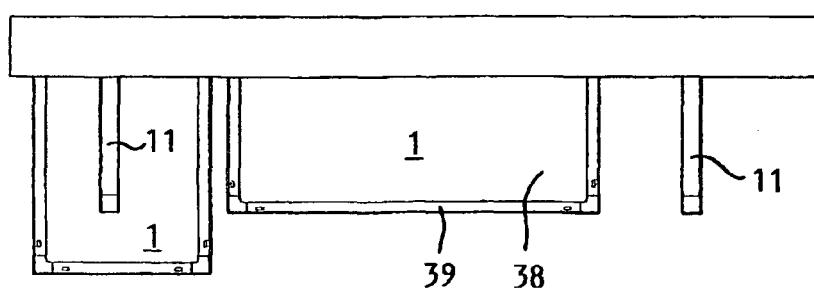


Fig. 2

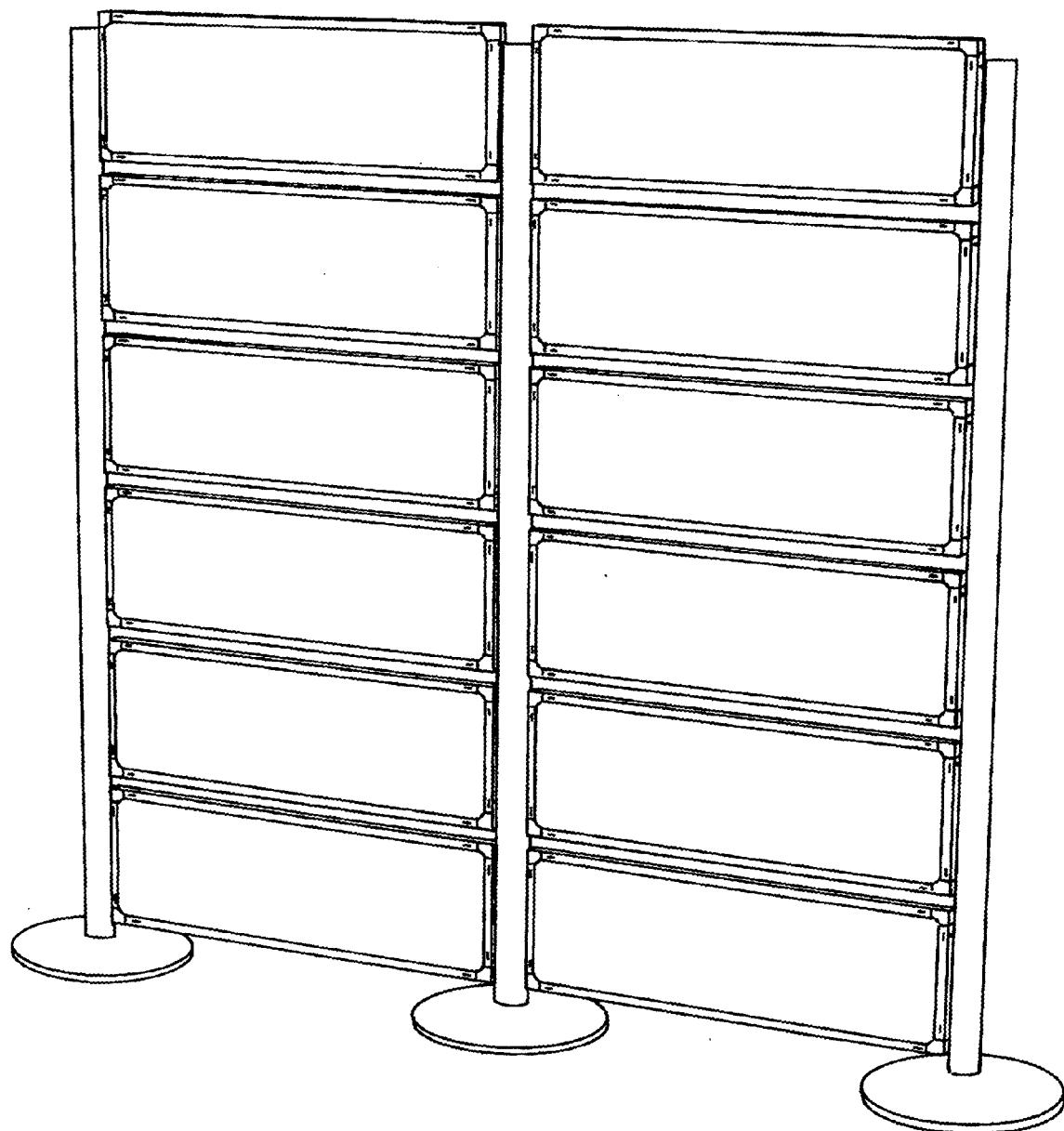




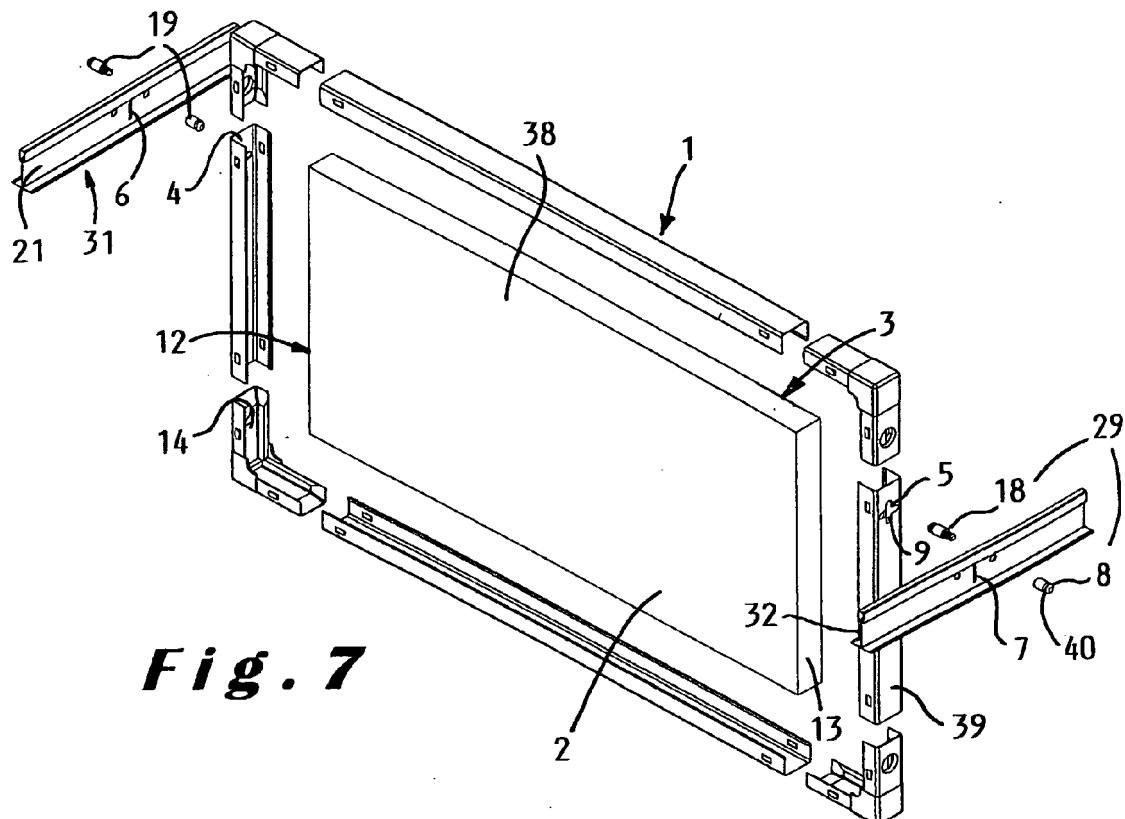
*Fig. 5b*



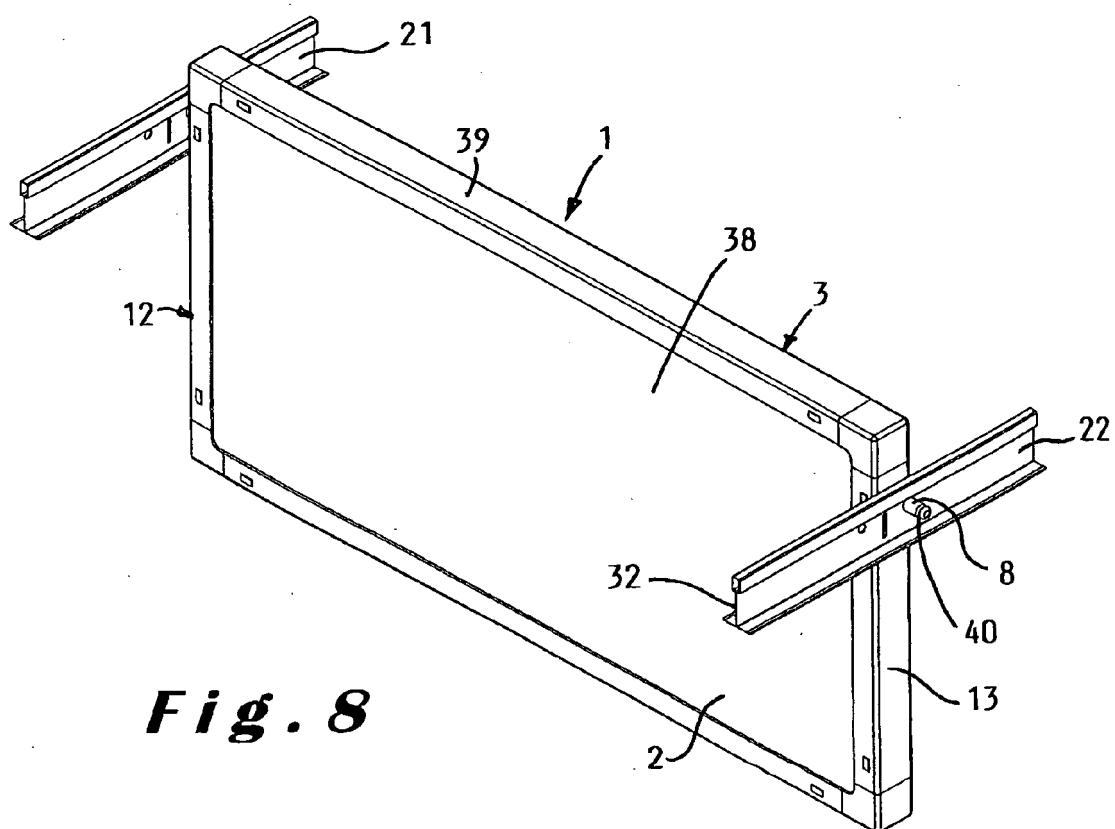
*Fig. 5c*



*Fig. 6*



*Fig. 7*



*Fig. 8*



## EUROPEAN SEARCH REPORT

Application Number  
EP 09 16 3507

| DOCUMENTS CONSIDERED TO BE RELEVANT  |   |  | CLASSIFICATION OF THE APPLICATION (IPC)  |
|--|---|--|--|
| Category   | Citation of document with indication, where appropriate, of relevant passages   | Relevant to claim                                |  |
| X  | US 6 446 396 B1 (MARANGONI LORIE [CA] ET AL) 10 September 2002 (2002-09-10)<br>* column 4, lines 24-59; figure 2 *<br>-----             | 1  | INV.<br>E04B1/86<br>E04B9/04<br>E04B9/06 |
| X  | US 6 240 665 B1 (BROWN TOBIAS A [US] ET AL) 5 June 2001 (2001-06-05)<br>* column 3, line 60 - column 4, line 4; figures 3,5b *<br>----- | 1  | ADD.<br>E04B1/84                         |
| X  | US 5 807 425 A (GIBBS ROBERT WILLIAM [CA]) 15 September 1998 (1998-09-15)<br>* column 3, lines 42-45; figures 1,6,6a,8<br>*<br>-----    | 1  |  |
|  |   |  | TECHNICAL FIELDS<br>SEARCHED (IPC)       |
|  |   |  | E04B                                     |
| The present search report has been drawn up for all claims   |   |  |  |
| 1  | Place of search<br>Munich   | Date of completion of the search<br>14 July 2009 | Examiner<br>Stern, Claudio               |
| <b>CATEGORY OF CITED DOCUMENTS</b> <p>X : particularly relevant if taken alone<br/> Y : particularly relevant if combined with another document of the same category<br/> A : technological background<br/> O : non-written disclosure<br/> P : intermediate document</p>                                  |   |  |  |
| <p>T : theory or principle underlying the invention<br/> E : earlier patent document, but published on, or after the filing date<br/> D : document cited in the application<br/> L : document cited for other reasons<br/> .....<br/> &amp; : member of the same patent family, corresponding document</p> |   |  |  |

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ON EUROPEAN PATENT APPLICATION NO.

EP 09 16 3507

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14-07-2009

| Patent document cited in search report |    | Publication date | Patent family member(s)  |  | Publication date |
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**REFERENCES CITED IN THE DESCRIPTION**

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