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⑤④ **UPPER TABLE.**

⑤⑦ Upper table superposable to a lower table (34) and provided with a horizontal working element (2) appropriate for housing the board (32) of the lower table (34) and which is comprised of: an upper rigid and thin plate (4) which defines two side areas (12), one rear area (14) and one central area (16) between the side areas (12) and the rear area (14); a bottom laminated arrangement (18) parallel to the laminated top (4) and with at least two side sections (20) and one rear section (22); and a vertical peripheral structure (30) rigidly integral with the laminated top (4) and with the laminated arrangement (18); in addition, there are provided lowerable vertical supports (40) which may be tilted between a vertical position where they are applied under the laminated top and

supporting it and a folding position which corresponds to the superposition of said upper and lower tables.

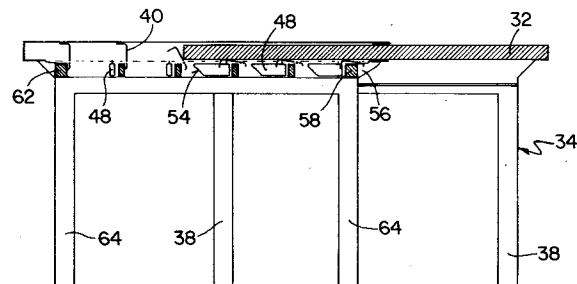
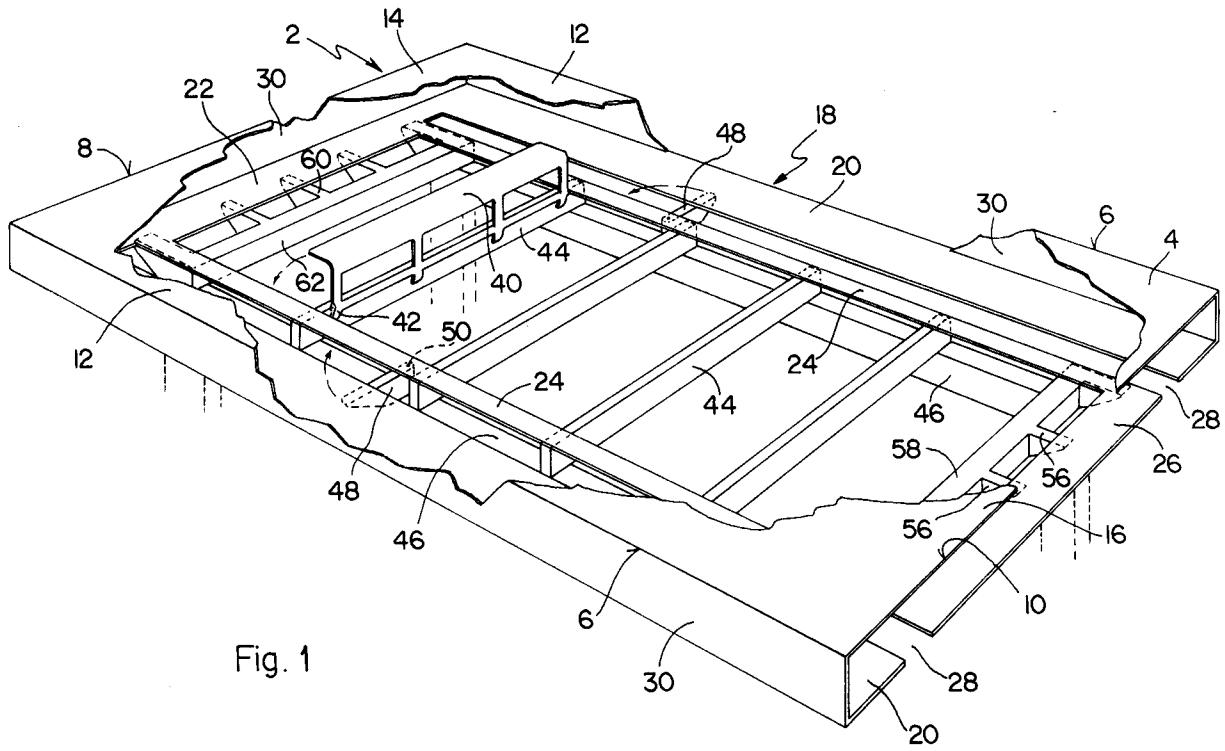


Fig. 7



The invention relates to an upper table, adapted to be placed over a lower table in one direction of superimposition, the upper table being provided with a horizontal working element and a first support structure comprising a plurality of cross members orientated transversely to said direction of superimposition and which bear on two stringers and said lower table is provided with a board and two rows of legs.

There is an increasing trend to reduce the area of dwellings and business premises, owing to the increasing cost of building. This reduction is immediately reflected in the size of the rooms, whereby there is the need to make the most advantage of the available space.

Part of this space is occupied by furniture, whereby the interest that the design of new furniture should respond to the above need to make the most of the space is appreciated. Several embodiments are already known in this direction: some relate to the convertibility between different types of furniture, such as the so-called bed settee; the prototype of others is to be found in the so-called pull-out bed, in which an upper bed is superimposed on a lower (nested) bed of a much lower height; and others are based on the formation of stacks of furniture, although it should be noted that the latter may not be used when they are stacked.

The applicant is proprietor of Spanish patents nos 8803784, 8803785 and 8902383 disclosing certain solutions allowing the unfolding of a piece of furniture so that it may be used for its specific purpose both in its unfolded state and prior to such unfolding.

With the present invention there is provided a particular case of unfolding of a table. The invention relates to a table of the type stated at the beginning which is characterized in that said horizontal working element of the upper table is adapted to accommodate said board of the lower table and comprises: a) a generally rectangular thin rigid upper sheet, having two opposite side edges generally parallel to said direction of superimposition, a rear edge and a front edge, defining two side areas adjacent the side edges, a rear area adjacent the rear edge and a central area comprised between the side and rear areas; b) a bottom sheetlike arrangement, generally parallel to said upper sheet and having at least two side sections situated generally as a straight projection of said side areas and one rear section situated generally as a straight projection of said rear area; and c) a vertical peripheral connexion structure, rigidly attached to the upper sheet and with the sheetlike arrangement; and in that there are folddown vertical supports, each of which is rigidly attached to a shaft of rotation, attached to a cross member, and is adapted to rock between a vertical position in which it

supportingly engages under said upper sheet, corresponding to the separated position of said upper and lower tables, and a folded down position corresponding to the superimposed position of said upper and lower tables, there being return means urging said folddown vertical supports to said vertical position.

In a preferred development of the invention, said bottom sheetlike arrangement is provided with a central section materialized by at least some longitudinal arms, each of which, on the one hand, bears on said cross members and, on the other hand, defines with one of the side sections of the arrangement a longitudinal free space in which one of said lines of legs of the lower table may be inserted, there being brackets rotating around a corresponding vertical axis extending between a arm and the corresponding stringer, each bracket being adapted to rotate between a first position transverse to said longitudinal free spaces, from under the arm to under the side section, corresponding to the separated position of the upper and lower tables and a second folded position in which in which the bracket is generally orientated in said direction of superimposition and corresponding to the superimposed position of the upper and lower tables, there being provided resilient means urging said rotating brackets to said first position.

Further advantages and features of the invention will be appreciated from the following description in which there are given preferred embodiments of the invention without any limiting nature, with reference to the accompanying drawings. The drawings show:

Figure 1 a perspective view, partly in section, of the horizontal working element of the upper table of the invention.

Figure 2 a perspective view of the upper table.

Figure 3 a similar view to the previous one, relating to the lower table.

Figure 4 a similar view to the previous two, corresponding to the position of superimposition of both tables.

Figure 5 is a cross section view of the lower table.

Figure 6 is a schematic longitudinal section view of the upper table.

Figure 7 is a cross section view similar to the previous one corresponding to a position of partial superimposition of the upper table and the lower table.

Figure 8 is a schematic view of a superimposition such as in Figure 7 on a horizontal plane immediately below the board of the lower table.

Figure 9 is a schematic section view in cross section of the upper table.

Figure 10, on a larger scale, a partial schematic view in cross section of one embodiment of the closing cover of the inner space of the horizontal working element.

The upper table of the present invention is provided with a horizontal working element 2; with this expression there is indicated the top of the table, for forming a support for the objects chosen by the user for work, ornaments or others; the adjective horizontal is used since this is the usual situation thereof.

This horizontal element 2 is formed by a thin rigid upper sheet 4, preferably of metal, the configuration of which is generally rectangular, it having therefore two opposed parallel side edges 6, a rear edge 8 and a front edge 10. It should be pointed out that in said upper sheet 4, there should be considered side areas 12, adjacent the edges 6, a rear area 14 adjacent the rear edge 8 and finally a central area 16 comprised between the previous named ones; very little of this central area is to be seen in Figure 1, since a large portion thereof has been deleted to allow an adequate representation of the remaining parts of the horizontal element 2.

Said horizontal working element 2 also comprises a bottom sheetlike arrangement 18 which is essentially parallel to the element 2; in the sheetlike arrangement there are two side sections 20 generally forming a straight projection of the side areas 12, as well as a rear section 22 which is in turn a straight projection of the rear area 14. Preferably the sheetlike arrangement 20 also comprises a central section which is at least materialized by longitudinal arms 24, with the possibility of there also being a front section 26 connecting the ends of the longitudinal arms 24.

Between each side section 20 and the corresponding longitudinal arm 24 there is defined a longitudinal free space 28, to the utility of which reference will be made hereinafter. The horizontal working element 2 is completed with a peripheral vertical connexion structure 30, which is constituted preferably by partitions rigidly attached to the upper sheet 4 and the sheetlike arrangement 18, although it may be formed by discontinuous elements or other means ensuring rigidity of the whole. From the illustration, it will be seen that the horizontal element 2 forms an envelope determining an inner space which is adapted to house the board 32 of a lower piece of furniture 34 of adequate dimensions and which also comprises lines of legs 36 and 38.

As said above, the upper table is adapted to be superimposed on the corresponding lower table 34, such that in the superimposed position they occupy practically the same volume as that occupied by the upper table. When taken out of the superimposed position, two useful tables are obtained.

Nevertheless, when the horizontal element 2 of the upper table does not contain the board 32 of the corresponding lower table 34, said element is not capable of absorbing heavy stresses, in view of the span of the upper sheet 4 thereof. To avoid the said drawbacks, the upper table is provided with folddown vertical supports 40 (for greater clarity only one of them is illustrated in Figure 1), each of which is attached to a rotating shaft 42 which is duly attached to a cross member 44 supported on the stringers 46. These folddown supports 40 may rock between a vertical position (Figures 1 and 6) in which the support is supportingly engaged below the upper sheet and a folded down position (righthand side of Figure 7). The first position corresponds to the position of separation of the upper and lower tables and the folded down position corresponds to the position of superimposition, such that as the board 32 is inserted in the inner space of the horizontal element 2, said board 32 successively overrides the folddown supports 40 and there are return means (not shown) consisting of springs or counterweights urging the supports 40 to the vertical position thereof.

The foregoing paragraph and Figures 7 and 8 allow it to be understood which is the direction of superimposition, i.e. the direction of relative movement between both tables which, in one sense leads to the superimposition thereof and, in the opposite sense, to separation thereof. In other paragraphs, reference has been made to this direction with the word longitudinal.

In the illustrated embodiment, it is only the central section (formed by the arms 24 and the front section 26) of the sheetlike arrangement 18 which rests on the cross members 44 and indirectly on the stringers 46 and this support is transmitted to the central area 16 of the upper sheet by means of the folddown supports 40. In this embodiment, therefore, the side sections 20 overhang, which may cause problems of strength. To avoid such problems, the invention contemplates the existence of brackets 48 which rotate around a vertical axis 50, extending in each case between a arm 24 and the corresponding stringer 46.

Each bracket 48 is capable of rotating between a first transverse position (shown in Figure 1 and the lefthand side brackets in Figures 7 and 8) and a position generally orientated in said direction of superimposition, i.e. longitudinally (brackets of the righthand side in Figures 7 and 8); resilient means, not shown either, urge the rotating brackets to the said first position.

As may be appreciated in the Figures, each longitudinal free space 28 allows the passage of a line of legs 36, 38 of the lower table 34; as these aligned legs 36, 38 enter in the space 28, they

force the brackets to the second position thereof and the stress supported thereby until then is then supported by the board 32 of the lower table 34, which bears in the normal way on said legs 36, 38.

Each side section 20 of the bottom sheetlike arrangement 18 is attached (for example by welding), at the under surface thereof, to an inclined plate 52 (Figures 2, 4 and 9). These plates 52 cover the respective free edges 54 (Figure 7) of the rotating brackets 48 when the latter are in the first position thereof. These plates 52 transmit the rising vertical stresses and the horizontal stresses to the brackets 48.

The invention also contemplates the existence of fixed front brackets 56 which extend from the front cross member 58 and engage below the front section 26 of the sheetlike arrangement 18, whereby they transmit the rising stresses which may occur when the upper table is raised by the front section.

At the rear of the upper table there are fixed rear brackets 60 which are fixedly attached to the rear cross member 62 and which engage below the rear section 22 of the sheetlike arrangement 18. These brackets 60 form part of a fixed connexion structure between the upper sheet 4 and the support structure (cross members 44, stringers 46 and legs 64).

The upper table is provided preferably with a closing cover 66 (Figures 2 and 6) which is swingingly attached to the front edge 10, 50 that it closes the inner space of the horizontal working element 2 when the tables are Separated and yields before the board 32 when this is inserted to superimpose the tables. In turn, the board 32 is provided with two handles 68 to facilitate removal thereof.

In Figure 10 there is to be seen another closing cover 67, attached to the lower edge, there being a housing 71 for the upper flange 73 thereof in the folded down position, which also contributes to sustain, in the raised position, the upper sheet 4; a spring, not shown, urges the cover 67 to the raised position thereof.

It is furthermore preferable that the upper table be provided with female guide members 70 adapted to engage in male guide ways 72 of the lower table. Thus it is avoided that when the tables are lifted by their legs in the superimposed position the upper sheet 4 is pulled away, since the rotating brackets, folded back in this superimposed position, do not cooperate to counteract upwardly directed external forces.

The reference symbols inserted after the technical features mentioned in the claims have the sole purpose of facilitating the understanding thereof and do not limit their scope in any way.

## Claims

1. An upper table, adapted to be placed over a lower table (34) in one direction of superimposition, the upper table being provided with a horizontal working element (2) and a first support structure comprising a plurality of cross members (44) orientated transversely to said direction of superimposition and which bear on two stringers (46) and said lower table (34) being provided with a board (32) and two rows of legs (36, 38), wherein said horizontal working element (2) of the upper table is adapted to accommodate said board (32) of the lower table (34) and comprises: a) a generally rectangular thin rigid upper sheet (4), having two opposite side edges (6) parallel to said direction of superimposition, a rear edge (8) and a front edge (10), defining two side areas (12) adjacent the side edges, a rear area (14) adjacent the rear edge and a central area (16) comprised between the side (12) and rear (14) areas; b) a bottom sheetlike arrangement (18), generally parallel to said upper sheet (4) and having at least two side sections (20) situated generally as a straight projection of said side areas (12) and a rear section (22) situated generally as a straight projection of said rear area (14); and c) a vertical peripheral connexion structure (30), rigidly attached to the upper sheet (4) and with the sheetlike arrangement (18); and in that there are folddown vertical supports (40), each of which is rigidly attached to a shaft of rotation, attached to a cross member (44), and is adapted to rock between a vertical position in which it supportingly engages under said upper sheet (4), corresponding to the separated position of said upper and lower tables, and a folded down position corresponding to the superimposed position of said upper and lower tables, there being return means urging said folddown vertical supports (40) to said vertical position.
2. The upper table of claim 1, wherein said bottom sheetlike arrangement (18) is provided with a central section materialized by at least longitudinal arms (24), each of which, on the one hand, bears on said cross members (44) and, on the other hand, defines with one of the side sections (20) of the arrangement (18) a longitudinal free space (28) in which one of said lines of legs (36, 38) of the lower table (34) may be inserted, there being brackets (48) rotating around a corresponding vertical axis (50) extending between a arm (24) and the corresponding stringer (46), said bracket (48) being adapted to rotate between a first position

transverse to said longitudinal free spaces (28), from under the arm (24) to under the side section (20), corresponding to the separated position of the upper and lower tables and a second folded position in which in which the bracket (48) is generally orientated in said direction of superimposition and corresponding to the superimposed position of the upper and lower tables, there being provided resilient means urging said rotating brackets (48) to said first position.

3. The upper table of claim 1 or 2, wherein to the underside each side section (20) of the bottom sheetlike arrangement (18) there is welded an inclined plate (52) covering the free edge (54) of the rotating brackets (48) when they are in the first position thereof, said plates (52) being adapted to transmit the rising vertical stresses and the horizontal stresses to said rotating brackets (48).
4. The upper table of one of claims 1 to 3, wherein said central section of the bottom sheetlike arrangement (18) is provided with a front section (26) and the table is provided with fixed front brackets (56) which connect a front cross member (58) with said front section (26) of the sheetlike arrangement (18), said brackets (56) being adapted to transmit the rising stresses which may occur when the table is lifted by said front section (26).
5. The upper table of one of claims 1 to 4, wherein it is provided with fixed rear brackets (60) connecting a rear cross member (62) with said rear section (22) of the lower sheetlike arrangement (18), constituting a fixed connexion structure between the rigid upper sheet (4) and the support structure.
6. The upper table of one of claims 1 to 5, wherein there is a closing cover (66) which is swingingly attached to the front edge (10) of the rigid upper sheet (4).

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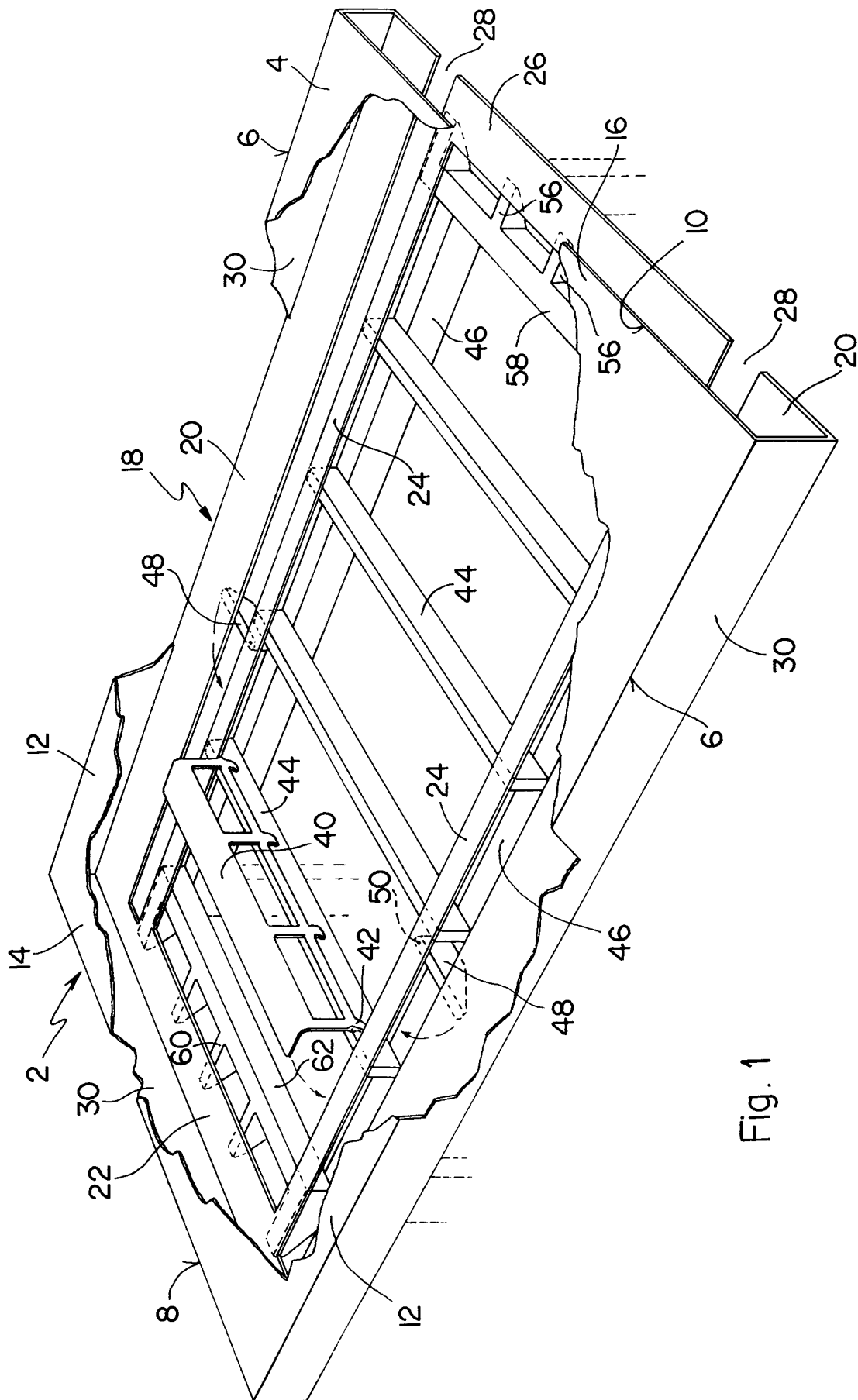


Fig. 1

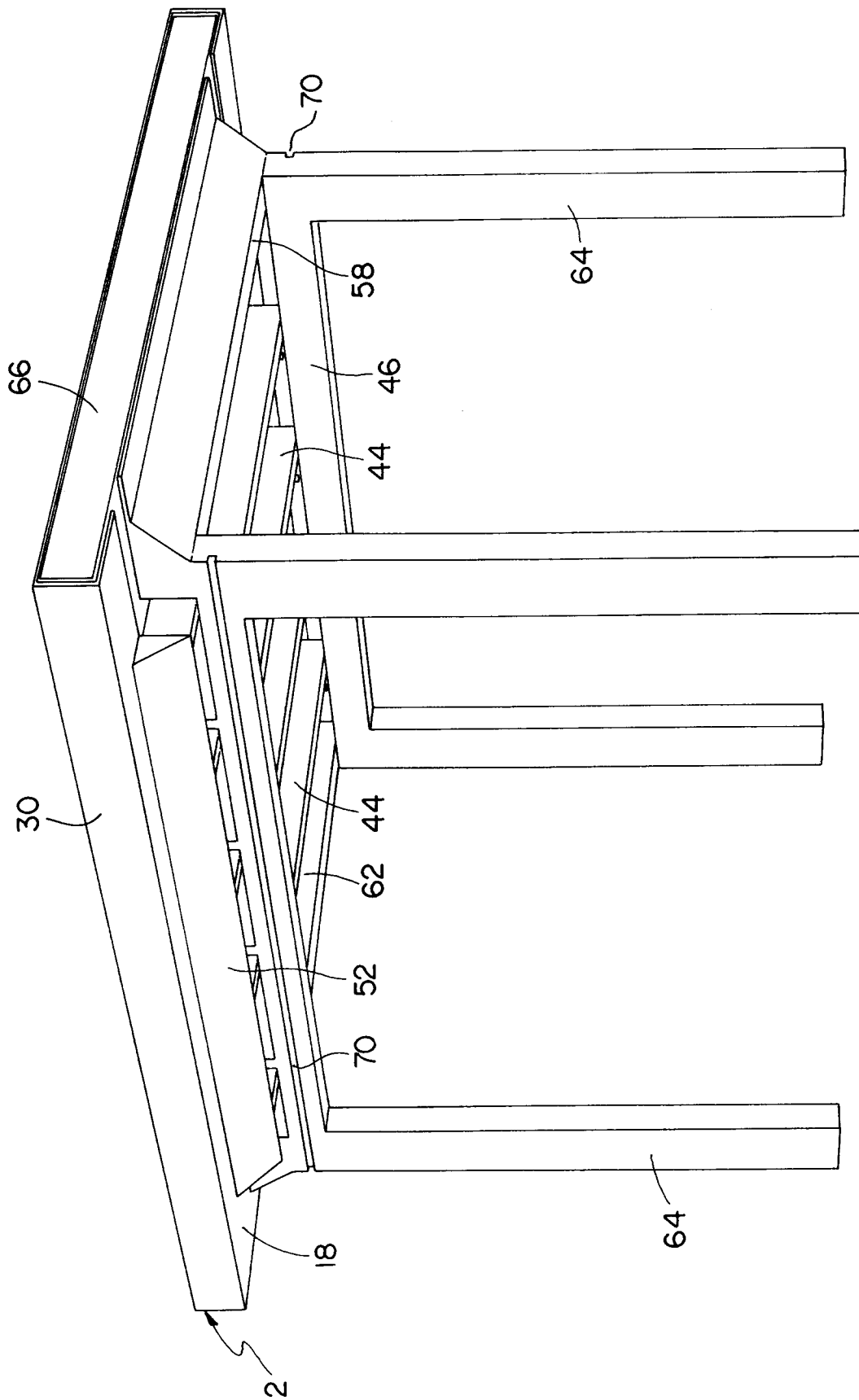


Fig. 2

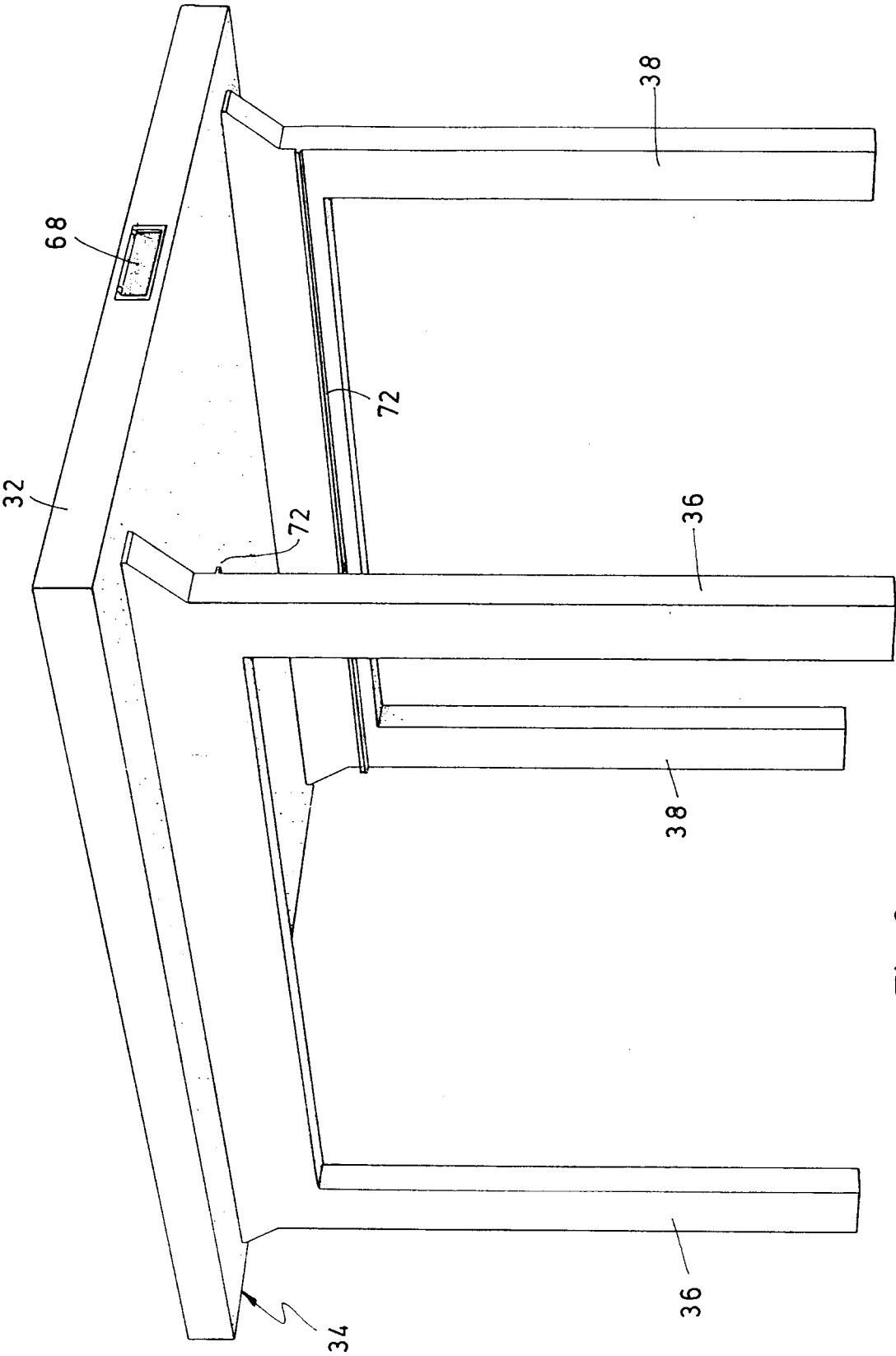


Fig.3

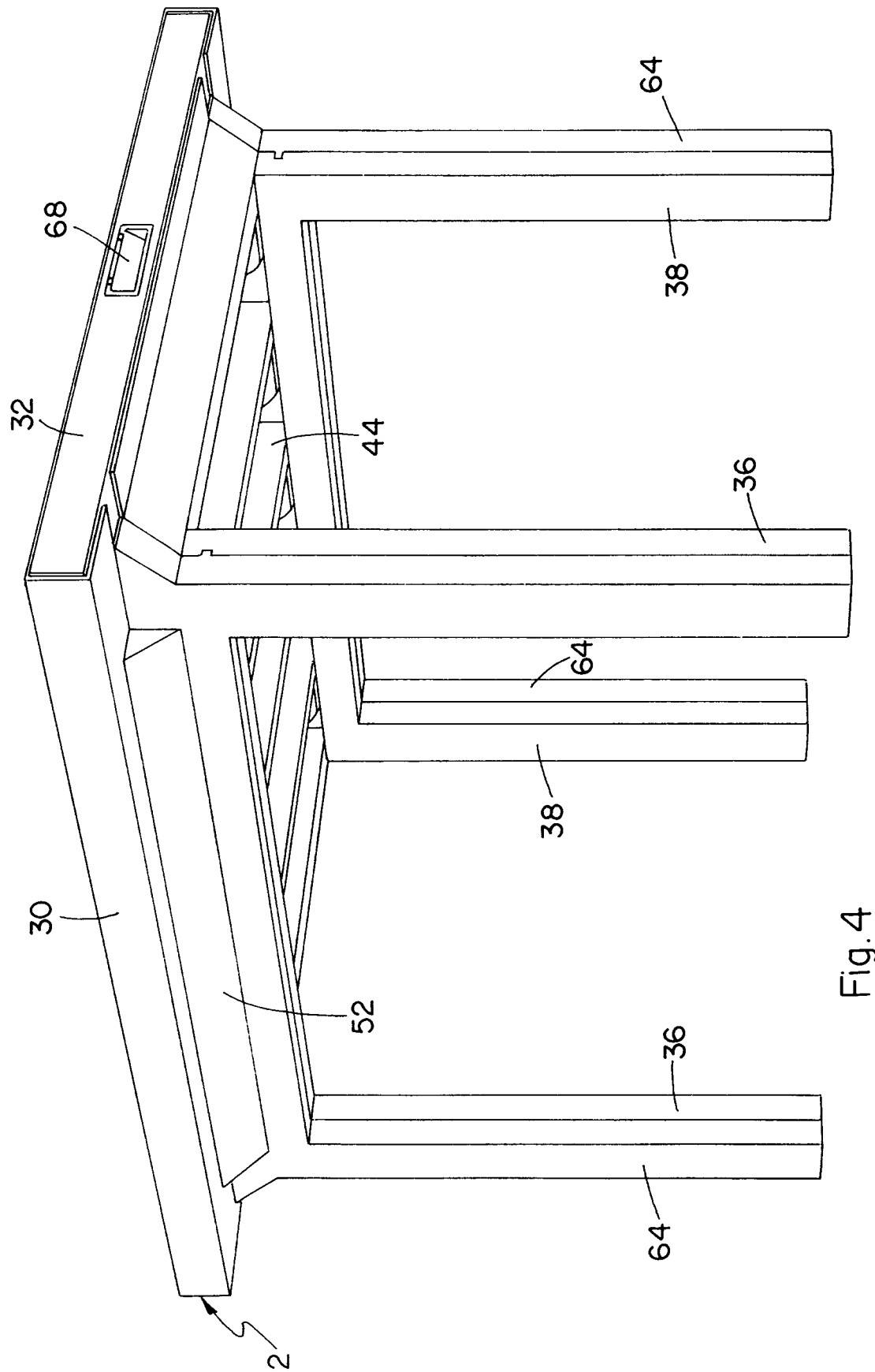


Fig. 4

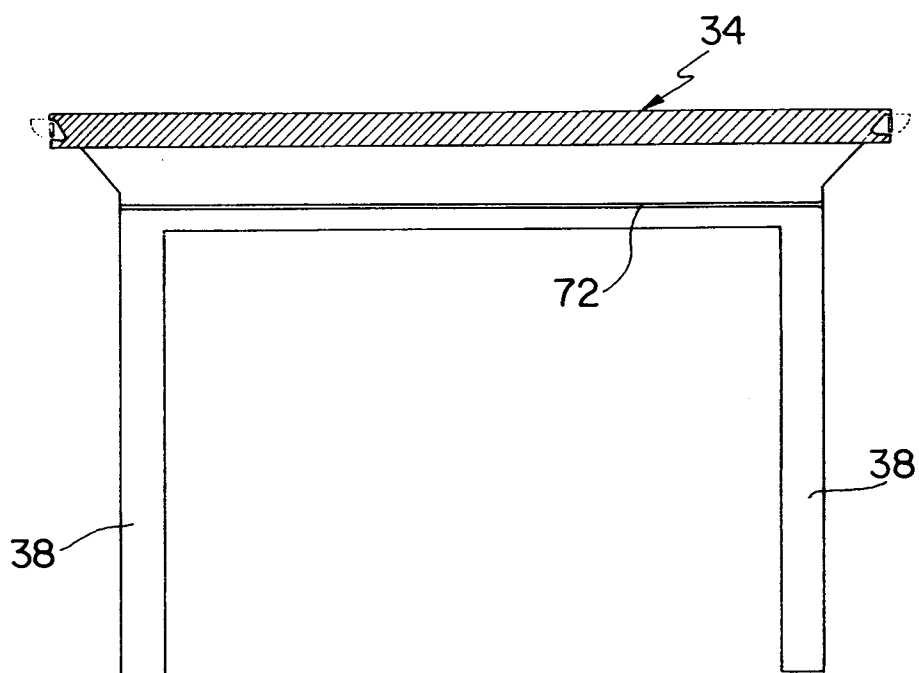


Fig. 5

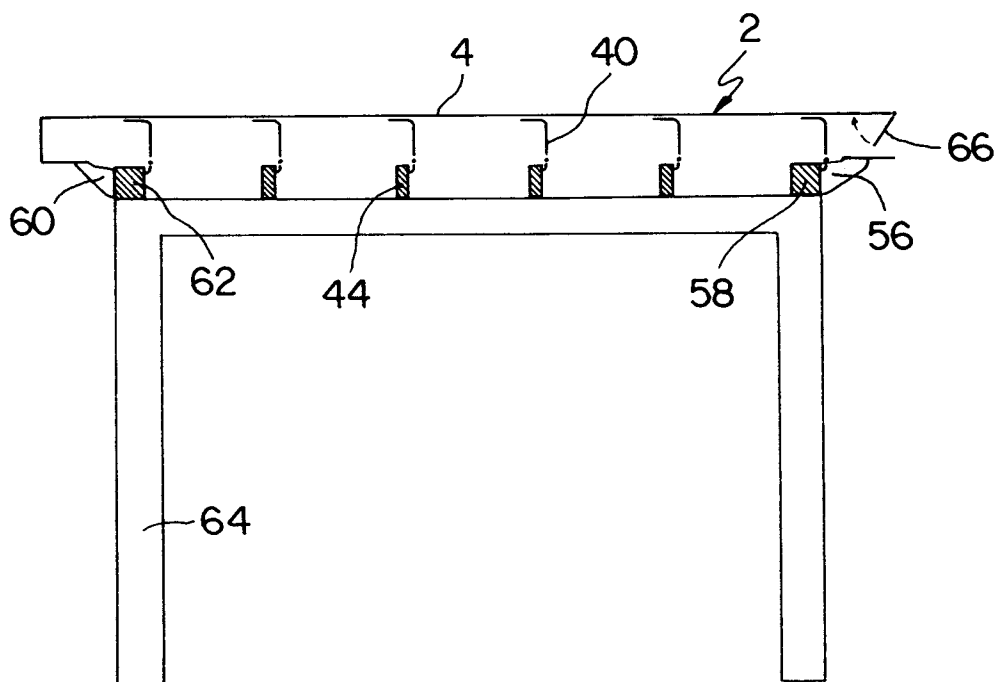


Fig. 6

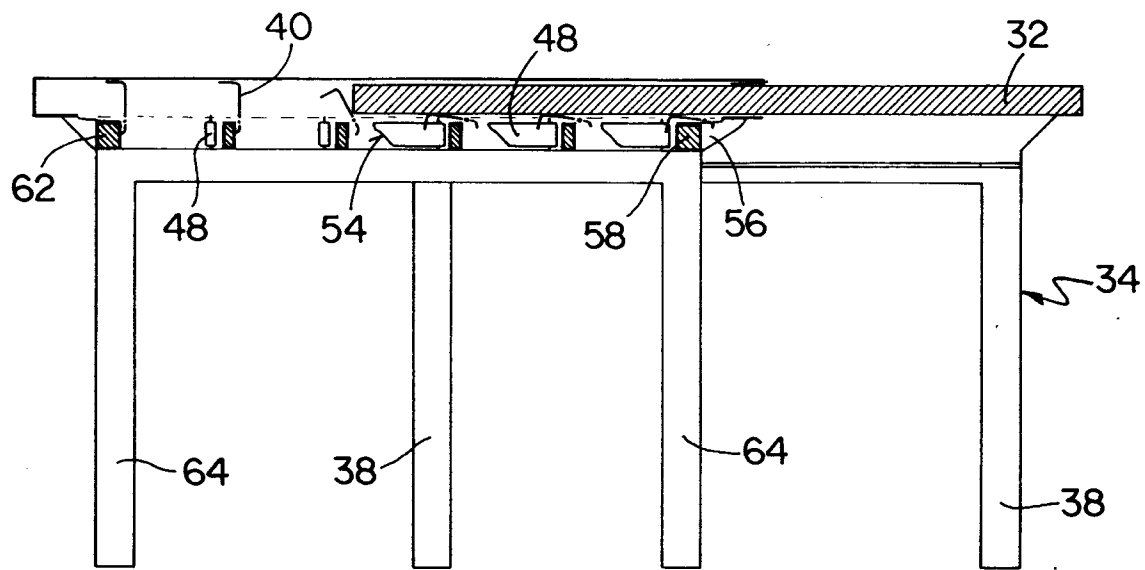


Fig. 7

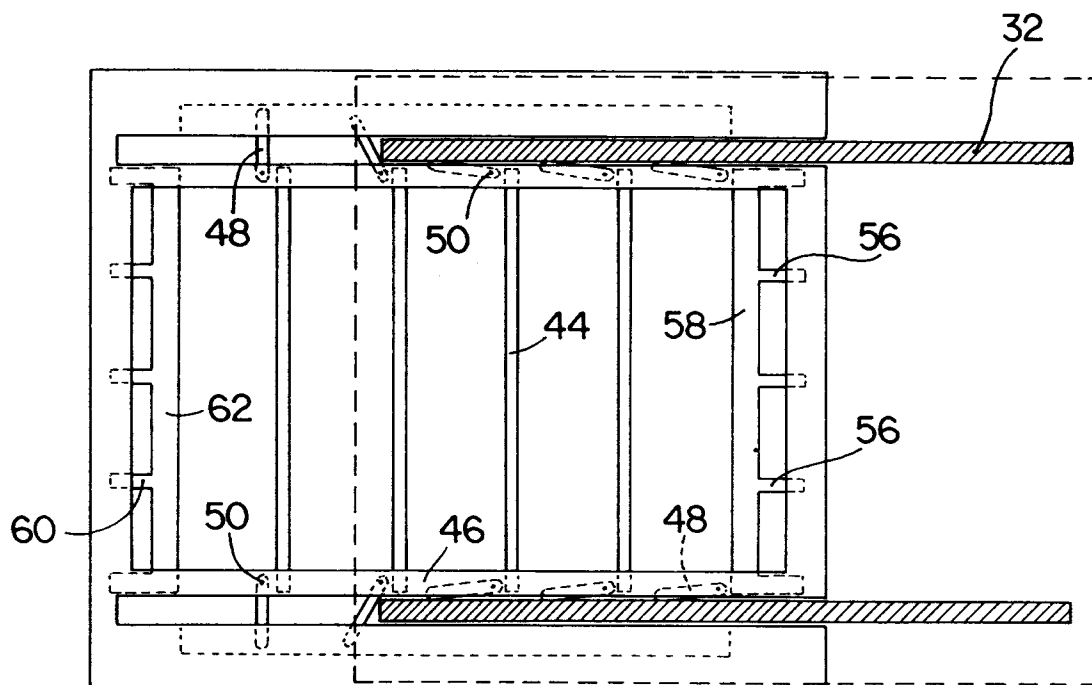


Fig. 8

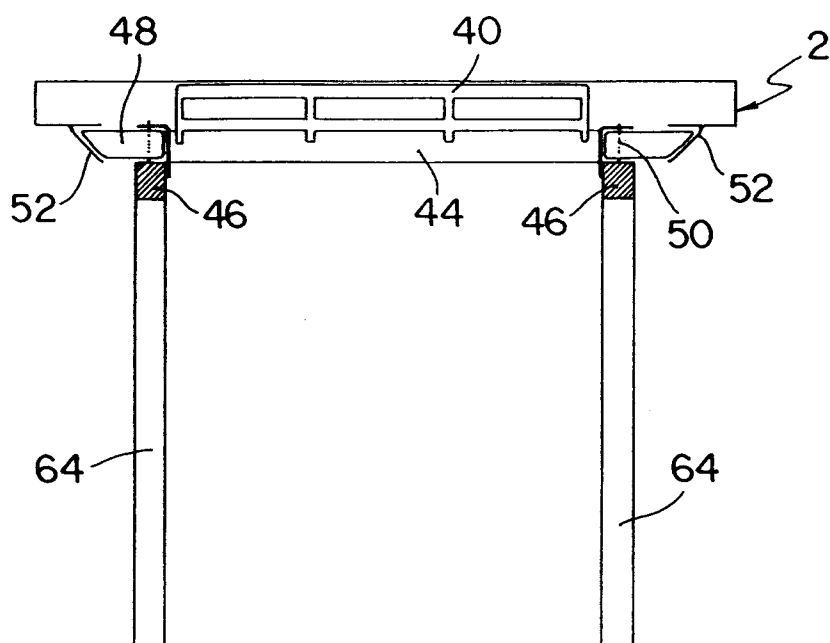


Fig. 9

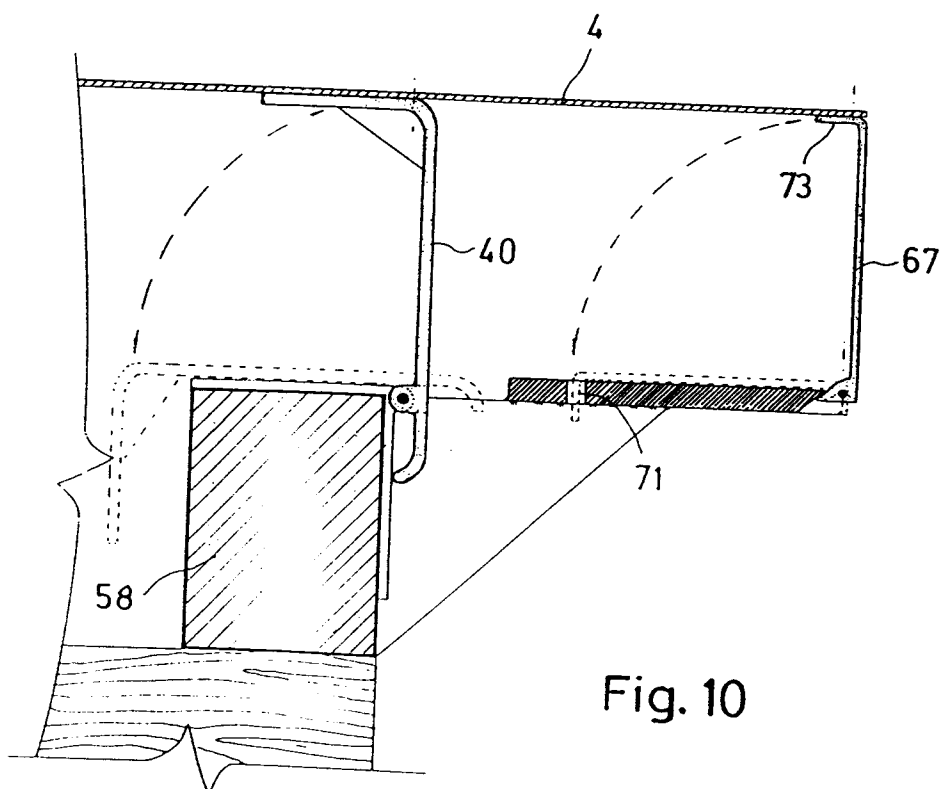


Fig. 10

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/ES 91/00066

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|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|-------------------------------------|
| <b>I. CLASSIFICATION OF SUBJECT MATTER</b> (If several classification symbols apply, indicate all) *                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                |                                     |
| According to International Patent Classification (IPC) or to both National Classification and IPC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                |                                     |
| Int. Cl. <sup>5</sup> : A 47 B 1/08, A 47 B 7/02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                |                                     |
| <b>II. FIELDS SEARCHED</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                |                                     |
| Minimum Documentation Searched <sup>7</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                |                                     |
| Classification System                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Classification Symbols                                                                                         |                                     |
| Int. Cl. <sup>5</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | A 47 B                                                                                                         |                                     |
| Documentation Searched other than Minimum Documentation<br>to the Extent that such Documents are Included in the Fields Searched *                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                |                                     |
| <b>III. DOCUMENTS CONSIDERED TO BE RELEVANT *</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                |                                     |
| Category *                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Citation of Document, <sup>11</sup> with indication, where appropriate, of the relevant passages <sup>12</sup> | Relevant to Claim No. <sup>13</sup> |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | GB, A, 1240951 (GRANT) 28 July 1971;<br>see page 1, line 60 - page 2,<br>line 14; figures<br>---               | 1                                   |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | US, A, 3760744 (CRUCKSHANK) 25 September 1973,<br>see abstract; figure 1<br>---                                | 1                                   |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | DE, B, 1291481 (OSTERTAG-WERKE) 20 June 1969,<br>see column 2, lines 31-53;<br>figure 2<br>---                 | 1                                   |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | US, A, 2626843 (SHENKER) 27 January 1953<br>---                                                                |                                     |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | DE, C, 599253 (DEUTSCHE WEKSTÄTTEN)<br>28 June 1934<br>---                                                     |                                     |
| <p>* Special categories of cited documents: <sup>10</sup></p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"Z" document member of the same patent family</p> |                                                                                                                |                                     |
| <b>IV. CERTIFICATION</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                |                                     |
| Date of the Actual Completion of the International Search                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Date of Mailing of this International Search Report                                                            |                                     |
| 17 January 1992 (17.01.92)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4 February 1992 (04.02.92)                                                                                     |                                     |
| International Searching Authority                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Signature of Authorized Officer                                                                                |                                     |