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An extensible table.

The invention relates to an extensible table comprising a table plate comprising at least two table plate portions, and a foot construction supporting the table plate, at least one slide bar unit being arranged under the table plate in its immediate vicinity. The slide bar unit comprises at least two interconnected slide bars (9) longitudinally displaceable with respect to each other so as to draw the table plate portions (2, 3) apart from each other for inserting an additional table plate portion between them. In order that the table could be extended by means of small slide bars in such a manner that it remains in a straight, horizontal position when extended, each slide bar (9) in the slide bar unit comprises a longitudinal groove (16) in which a guide piece (19) is fastened close to one end of the slide bar, the guide piece being arranged eccentrically in the groove so that its edge (20) facing away from the table plate and entering the groove of the adjacent slide bar is at a greater distance from the centre line of the groove (16) than its opposite edge (21), similarly entering the groove of the adjacent slide bar.

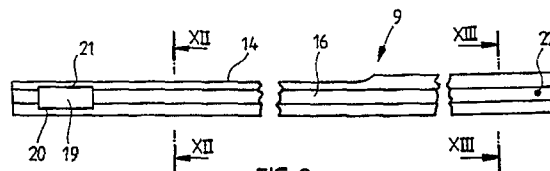


FIG. 9

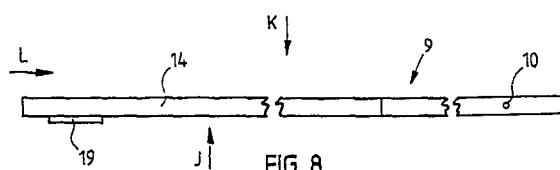


FIG. 8

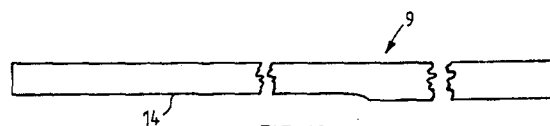


FIG. 10

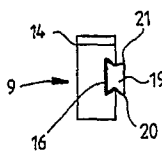


FIG. 11

An extensible table

The invention relates to an extensible table comprising a table plate comprising at least two table plate portions, and a foot construction supporting the table plate, at least one slide bar unit being arranged under the table plate in its immediate vicinity, the slide bar unit comprising at least two interconnected slide bars longitudinally displaceable with respect to each other so as to draw the table plate portions apart from each other for inserting an additional table plate portion therebetween.

Extensible tables are well-known and the details of their extendibility may be effected in various ways. The present application, however, is limited to tables which are extended by drawing apart the table plates so that one or more additional plates can be inserted therebetween. A frequent problem with extensible tables provided with slide bars is that the slide bars supporting the table plate portions bend under the weight of the table plate portions so that the surface of the table is bent, being no longer fully horizontal. This is not merely a matter of appearance but it may also deteriorate the operating properties of the table. If the slide bars are slender, the support is unstable; large slide bars, of course, support the table plates better than small ones; on the other hand they are bulky and expensive to manufacture. Slide bars are usually made of wood which has a good rigidity in relation to its weight and volume. Alternatively, the slide bars can be made of galvanized iron or in some cases of aluminium even though the table itself would be made of wood.

An advantage of metal slide bars is that they can be small in size without any risk of breaking. A disadvantage is that they deflect considerably even under a very low load. The deflection of an aluminium slide bar is particularly high due to the high elastic modulus of aluminium.

The object of the present invention is to eliminate the above-mentioned problems. To achieve this, the table according to the invention is characterized in that each slide bar in the slide bar unit comprises a longitudinal groove in which a guide piece is fastened close to one end of the slide bar, the guide piece being arranged eccentrically in the groove so that its edge facing away from the table plate and entering the groove of the adjacent slide bar is at a greater distance from the centre line of the groove than its opposite edge, similarly entering the groove of the adjacent slide bar, whereby the guide pieces in the slide bars guide the slide bars so that the more the slide bars are drawn apart from each other, the more the slide bars deviate from their parallel position with respect to

each other. The slide bar unit is preferably formed by a pair of slide bars, whereby an end portion of the upper surface of each slide bar in the pair of slide bars is recessed on the side of the guide piece, the unrecessed slide bar surface on the other side being intended to be fastened directly to the table plate above. The extensible table is simple to manufacture and steady in construction when two pairs of slide bars are used, whereby all the slide bars in the pairs of slide bars and the guide pieces attached thereto are fully identical.

The basic idea of the present invention is to provide an extensible table with slide bars which in the extended position tend to form an angle which creates a kind of preload for slide friction, compensating for the load caused by the weight of the table plates so that the table plates are in a straight position even in the extended position of the table. In the closed or retracted position the slide bars extend substantially in parallel.

A major advantage of the table according to the invention is that the table plates remain straight and horizontal in the extended position even though the slide bars by means of which the table can be extended are relatively small in size and easy to manufacture. The slide bars are easy to operate so that the table can be rapidly changed from one position of use to another without any greater force. The solution of the invention can also be applied to a flap hinge table whereby an additional table plate attached to the end of the table is fastened by means of the slide bars of the invention in such a way that the additional table plate can be fixed in horizontal position without that its outer edge slopes downwards.

In the following the invention will be described in greater detail with reference to the attached drawings, wherein

Figures 1 and 2 show a top view of a table according to the invention when in retracted and extended position, respectively;

Figures 3 and 4 illustrate the solution according to the invention;

Figures 5, 6 and 7 illustrate the support of the table plate portions of the table according to the invention in retracted and extended position, respectively, as a side view enlarged to twice the size of Figures 1 and 2;

Figures 8 to 10 show the slide bar from above and from both sides when enlarged fourfold as compared with Figures 1 and 2;

Figure 11 shows the slide bar of Figure 8 as viewed in the direction of the arrow L and enlarged double as compared with Figure 8;

Figure 12 is a sectional view of the slide bar

of Figure 9 along the section XII-XII and enlarged double as compared with Figure 9;

Figure 13 is a sectional view of the slide bar of Figure 9 along the section XIII-XIII and enlarged double as compared with Figure 9;

Figures 14 to 16 show a slide bar interacting with the slide bar of Figures 8 to 10 from above and from both sides when enlarged fourfold as compared with Figures 1 and 2;

Figure 17 is an end view of a pair of slide bars formed by the slide bars of Figures 8 to 10 and 14 to 17 when enlarged double as compared with Figures 8 and 14;

Figure 18 is a perspective view of a guide piece for the slide bars shown in Figures 8 and 14 when enlarged double as compared with Figures 8 and 14;

Figure 19 is a cross-sectional view of an alternative guide piece; and

Figures 20 to 22 show another embodiment of the invention.

In Figure 1, the extensible table according to the invention is shown from above in retracted position. In order to illustrate the slide bar construction, the table plate, generally indicated with the reference numeral 1, is drawn by broken lines. The table plate 1 comprises two abutting table plate portions 2 and 3. Two slide bar units 4, 5 are arranged under the table plate portions 2, 3. Both slide bar units are formed by a pair 4, 5 of slide bars comprising two interconnected slide bars 6, 7 and 8, 9, respectively, arranged side by side and longitudinally displaceably with respect to each other. The slide bars 6 to 9 are made of wood, and the upper surface of each slide bar is provided with holes 10 for screws for fastening the table plate portions 2, 3 (directly) on the slide bars. One end portion 11-14 of said upper surface is recessed so that it does not make contact with the lower surface of the table plate portions 2, 3. The function of the recessed portions will be described later. For the sake of clarity, the foot construction supporting the table plate construction is not shown in Figure 1.

In Figure 2, the extensible table according to the invention is shown in extended position, an additional table plate portion 15 being inserted between the table plate portions 2 and 3. The additional table plate portion 15 is fitted in position between the table plate portions 2 and 3 in a manner known for one skilled in the art.

Figures 3 and 4 illustrate the operation of the pair of slide bars to be used in the table according to the invention. The figures show the pair of slide bars from the side. The backward slide bar A, drawn with unbroken lines, comprises a groove B extending along the bar, and a guide piece C is fitted in the groove. The guide piece C projects from the slide bar so as to enter a groove (not

shown) in a slide bar D (drawn with broken lines) positioned on the slide bar A. The groove in the slide bar D extends longitudinally similarly as the groove B in the slide bar A. The guide piece C is fastened close to the left end of the slide bar A, and it is arranged eccentrically so that its free lower edge E is at a greater distance from the centre line of the groove B than its upper edge F. The slide bar D comprises a guide piece G similar to that of the slide bar A. The guide piece G is fastened close to the right end of the slide bar D, and its upper edge H is at a greater distance from the centre line of the groove in the slide bar than its lower edge I. Even though the guide pieces C and G are arranged eccentrically as described above, the slide bars A and D extend substantially in parallel with each other, defining therebetween an angle $\alpha \approx 0$ in the retracted position of Figure 3. When the slide bars A and D are drawn part, the guide pieces C and G approach each other and the angle α grows. The angle between the slide bars A and D is the greater, the more the slide bars A and D are drawn apart. In Figure 4, an angle α_1 defined between the slide bars A and D is clearly larger than the angle α in Figure 3. As the guide pieces C and G are positioned close to the ends of the slide bars A and D, respectively, an advantage is obtained in that substantially the entire length of the slide bars can be utilized so that the length of an extended pair of slide bars is nearly the sum of the lengths of the individual slide bars.

Figure 5 shows the table of Figure 1 from the side when enlarged double. In Figure 5, showing the table plate construction in retracted position, the same reference numerals as in Figure 1 are used. A longitudinal groove in the slide bar 9 is indicated with the reference numeral 16. The slide bar 8 comprises a similar groove (not shown in Figure 5). As appears clearly from Figure 5, one end portion 13 and 14 of the upper surface of each slide bar 8 and 9 in the pair of slide bars is recessed. The function of the recessed portions appears from Figure 6, which shows the table construction of Figure 5 in extended position with the additional table plate portion 15 fitted between the table plate portions 2 and 3. Figure 6 shows how the pairs of supporting slide bars in the solution according to the invention tend to deform the table plate 1. The table plate portions 2, 3 could not be drawn apart from the position of Figure 5 to that of Figure 6 if the end portions 13, 14 of the upper surfaces of the slide bars would not be recessed. Without such recessed portions, the left-hand end portion of the upper surface of the slide bar 9 would hit the lower surface of the table plate portion 2 so that the surfaces would get stuck and the plate portions could not be drawn apart. Correspondingly, the right-hand end portion of the

upper surface of the slide bar 8 would hit the lower surface of the table plate portion 3 so that the surfaces would get stuck. It is also possible that the upper surfaces of the slide bars are straight instead of being recessed. In this case, the lower surfaces of the table plate portions 2, 3 should be provided with grooves corresponding to the slide bars in width and sufficiently deep to enable the slide bars to be drawn apart. Alternatively, spacers corresponding to the recesses, such as support ribs, can be provided between the table plates 2 and 3 and the slide bars 8 and 9 so as to form a sufficiently wide gap, corresponding to gaps 17 and 18 in Figure 5, between the upper surface of one end portion of the slide bars and the lower surface of the table plates. In practice, the shape of the extended table plate construction will not be such as shown in Figure 6, but the weight of the table plate portions 2, 3 and 15 cause the slide bars 8 and 9 to bend so that the shape of the table plate construction is such as shown in Figure 7, in which the table plate 1 is even and horizontal.

Figure 8 shows the slide bar 9 of Figure 1 from the top and enlarged fourfold. Figure 9 shows the slide bar of Figure 8 as seen in the direction J. It appears from Figure 8 how a guide piece 19 fitted in the groove 16 of the slide bar close to the end of the slide bar projects from the groove. An end portion 14 of the upper surface 9 of the slide bar is recessed on the side of the guide piece 19. The guide piece 19 is asymmetrical in cross-section as seen in the direction of the groove 16 so that its lower edge 20 facing away from the table plate and to be fitted in the groove of the adjacent slide bar is at a greater distance from the centre line of the groove 16 than its opposite upper edge 21 similarly to be fitted in the groove of the adjacent slide bar (corresponding to the arrangement of Figure 3). A stop member, such as a nail 22, is arranged in the groove 16 so as to prevent the detachment of the two adjacent slide bars from each other: the guide piece of one of the two slide bars is arrested by the nail in the other slide bar. The shape and position of the stop member may deviate from those shown in the figure. Figure 10 shows the slide bar of Figure 8 as seen in the direction K.

Figure 11 shows the slide bar of Figure 8 as seen in the direction L. As appears from Figures 11 and 12, the groove 16 is symmetrical and dovetail shaped. The guide piece 19 positioned in the groove 16 is such in shape that after having been turned through 180° around its longitudinal axis, its shape is the same as before turning.

Figures 12 and 13 show the slide bar of Figure 9 along the section XII-XII and XIII-XIII, respectively.

Figures 14 to 16 show the slide bar 8 of Figure 1 from above and from both sides when enlarged

four-fold. So the slide bar 8 shown in Figures 14 to 16 interacts with the slide bar 9 of Figures 8 to 10. A guide piece fastened to the slide bar 8 close to its one end is indicated with a reference numeral 23. An edge 24 of the guide piece 23 facing the table plate 1 and entering the groove of the adjacent slide bar is positioned closer to the centre line of the groove 25 than its opposite edge 26, similarly entering the groove of the adjacent slide bar. Figure 15 shows the slide bar of Figure 14 as seen in the direction M, and Figure 16 shows the slide bar of Figure 14 as seen in the direction N. The groove of the slide bar 8 is indicated with 25. As appears from Figures 14 to 16, the slide bar 8 is fully identical with the slide bar 9. Considerable economic advantages are obtained in the manufacture of slide bars when the slide bars 8 and 9 forming the pair 5 of slide bars are fully identical.

Figure 17 shows a pair of slide bars formed by the slide bars of Figures 8 to 10 and 14 to 17 as seen from the end and enlarged double as compared with Figures 8 and 14.

Figure 18 is a perspective view of the guide piece 23 attached to the slide bar 8. Similarly as above, the guide piece 19 attached to the slide bar 9 is fully identical with the guide piece 23.

Figure 19 shows a cross-section of an alternative guide piece to be attached to the slide bars.

Figures 20 to 22 show a preferred embodiment of the slide bar unit when a wide range of extendability is required. In Figure 20, a slide bar unit 28 is shown from above. The slide bar unit comprises three interconnected slide bars 29, 30, 31 arranged side by side and longitudinally displaceably with respect to each other. The outermost slide bars 29 and 31 are of the same type as the slide bars 5 to 8 shown in Figures 1, 2 and 5 to 17. Thus they comprise grooves (not shown in Figure 20), guide pieces 33 and 37 (drawn by broken lines) and recessed portions 38 and 39. The middlemost slide bar is of different type, comprising two grooves (not shown in Figure 20) and guide pieces 32, 32' - (drawn by broken lines) fitted in the grooves. The guide pieces 32, 32', are fastened to the slide bar 30 in such a manner that they are positioned close to the ends of the two slide bars at opposite ends. When the slide bars 29 to 31 in the slide bar unit 28 of Figure 20 are drawn apart, the distance X between the guide pieces 32' and 33 and the distance Z between the guide pieces 32 and 37 decreases. Roughly speaking, the maximum length of the slide bar unit in extended position is the sum of the lengths of the slide bars forming it. Figure 21 shows a section along the line XXI-XXI of Figure 20. As appears from the figure, the upper surface of the middlemost slide bar 30 is positioned lower than the upper surface of the outermost slide bars 29 and 31. This is because the upper surface of

the middlemost slide bar should be sufficiently low to allow the operation of the slide bar arrangement. It appears from the figure that grooves 34, 34' on both sides of the slide bar 30 are of the same shape as those in the outermost slide bars 29 and 31. It further appears that the guide piece 32 is fitted in the groove 34 of the slide bar 30 eccentrically so that its edge 35 facing away from the table plate and entering the groove of the adjacent slide bar 31 is at a greater distance from the centre line of the groove 34 than its opposite edge 36 similarly entering the groove of the adjacent slide bar. Figure 22 shows a section along the line XXII-XXII of Figure 20. As appears from the figure, an edge 35' which faces away from the table plate and enters the groove of the adjacent slide bar 29 is at a greater distance from the centre line of the groove 34' than the opposite edge 36' similarly entering the groove of the adjacent slide bar 29. This construction is such that the more the outermost slide bars 29 and 31 are drawn apart, the more they deviate from their parallel position with respect to the middlemost slide bar 30; in this way, a double preload effect is attained in the slide bar unit 28. It further appears from Figures 21 and 22 that the nail-like stop members 40 and 41 are arranged in the grooves of the middle most slide bar 30 in such a manner that they are positioned on opposite sides with respect to the guide pieces 32 and 32'. The stop members 40 and 41, which are fastened close to each end of the slide bar 30, prevent the outermost slide bars 29 and 31 from being detached from the slide bar 30.

The invention has been described above by way of example. In its detail, the invention can be realized in various ways deviating from the figures referred to above and within the scope of the attached claims. Accordingly, the number and shape of the slide bars can vary (a single pair of slide bars is enough for supporting the table plates though it is preferable to use two pairs). In view of the manufacturing techniques, however, it is important that the guide pieces in both slide bars in the pair of slide bars are identical in shape and that the grooves in both slide bars of the pair of slide bars are identical in shape. The shape and position of the stop member may also vary. The slide bars need not be made of wood, though wood is to be preferred.

Claims

1. An extensible table comprising a table plate (1) comprising at least two table plate portions (2, 3), and a foot construction supporting the table plate, at least one slide bar unit (4, 5; 28) being arranged under the table plate (1) in its immediate

vicinity, the slide bar unit comprising at least two interconnected slide bars (6, 7, 8, 9; 29, 30, 31) longitudinally displaceable with respect to each other so as to draw the table plate portions (2, 3) apart from each other for inserting an additional table plate portion (15) therebetween, **characterized** in that each slide bar (6, 7, 8, 9; 29, 30, 31) in the slide bar unit (4, 5; 28) comprises a longitudinal groove (16, 25, 34, 34') in which a guide piece (19, 23, 32, 32') is fastened close to one end of the slide bar, the guide piece being arranged eccentrically in the groove (16, 25, 34, 34') so that its edge (20, 26, 35, 35') facing away from the table plate (1) and entering the groove of the adjacent slide bar is at a greater distance from the centre line of the groove (16, 25, 34, 34') than its opposite edge (21, 24, 36, 36') similarly entering the groove of the adjacent slide bar, whereby the guide pieces in the slide bars guide the slide bars (6, 7, 8, 9; 29, 30, 31) so that the more the slide bars are drawn apart from each other, the more the slide bars deviate from their parallel position with respect to each other.

2. A table according to claim 1, **characterized** in that the slide bar unit (4, 5) is formed by a pair of slide bars, whereby an end portion (11, 12, 13, 14) of the upper surface of each slide bar (6, 7, 8, 9) in the pair of slide bars is recessed on the side of the guide piece (19, 23), the unrecessed surface of the slide bar on the other side being intended to be fastened directly to the table plate (2, 3) above.

3. A table according to claim 1, **characterized** in that the slide bar unit (28) is formed by three slide bars (29, 30, 31) arranged side by side, an end portion (38, 39) of the upper surface of the outermost slide bars (29, 31) being recessed on the side of the guide piece (33, 37) fastened to the slide bars, whereby the unrecessed surface of the outermost slide bars on the other side is intended to be fastened directly to the table above.

4. A table according to claim 1, **characterized** in that the grooves (16, 25, 34, 34') in the slide bars (6, 7, 8, 9; 29, 30, 31) of the slide bar unit (4, 5; 28) are identical and symmetrical.

5. A table according to claim 4, **characterized** in that the grooves (16, 25; 34, 34') are dovetail shaped.

6. A table according to claim 2, **characterized** in that it comprises two slide bar units (4, 5), all the slide bars (6, 7, 8, 9) in the slide bar units and the guide pieces (19, 23) attached thereto being fully identical.

7. A table according to claim 3, **characterized** in that it comprises two slide bar units, the outermost slide bars in the slide bar units and the guide pieces attached thereto being fully identical.

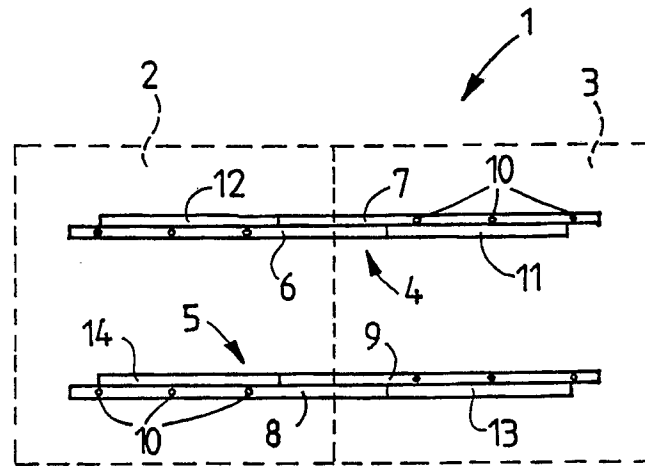


FIG. 1

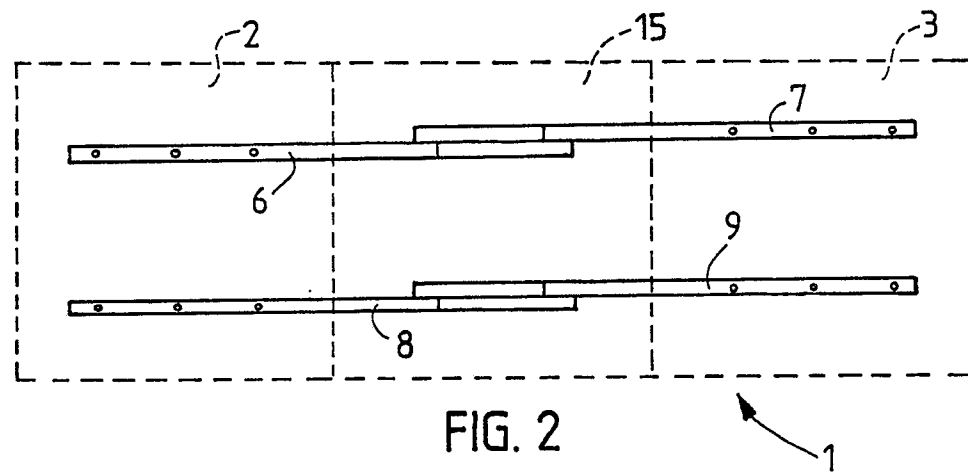


FIG. 2

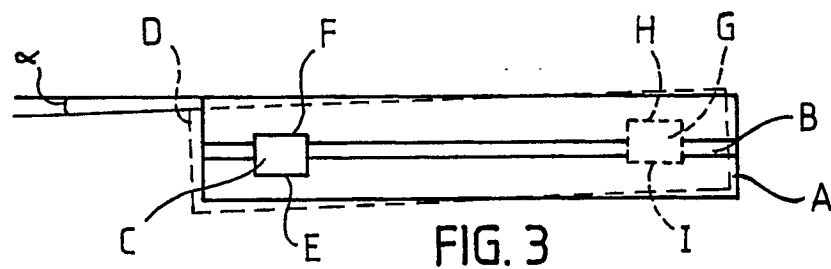


FIG. 3

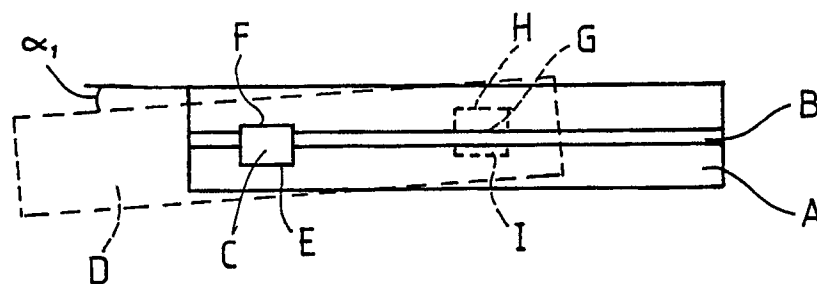


FIG. 4

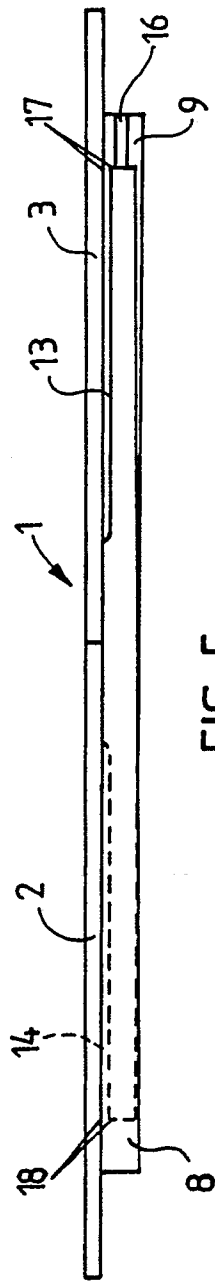


FIG. 5

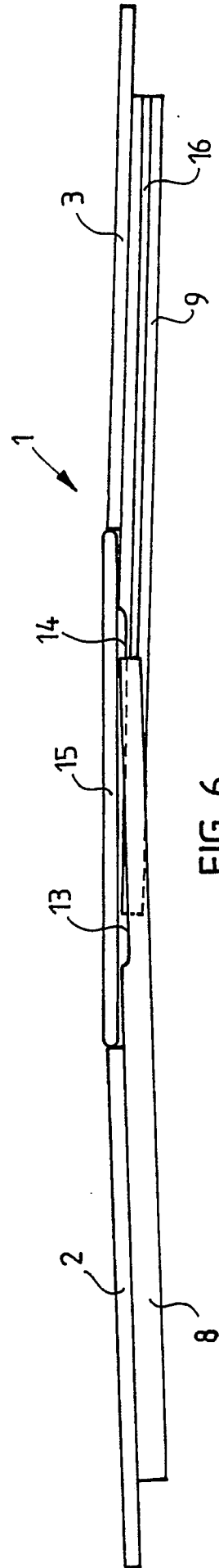


FIG. 6

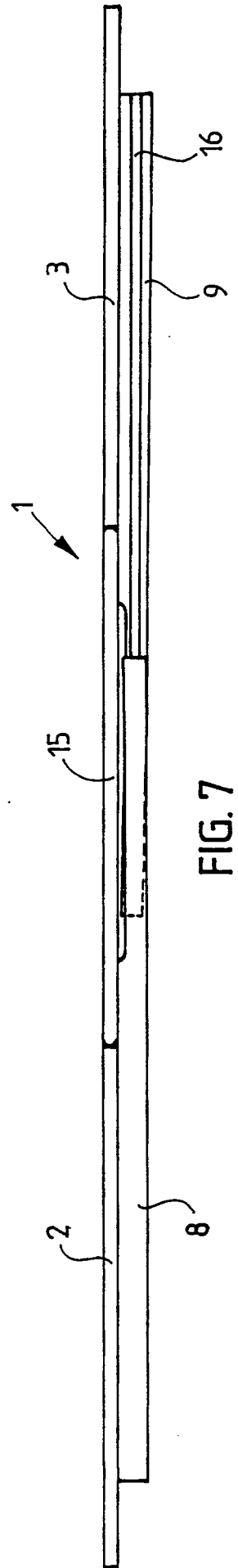


FIG. 7

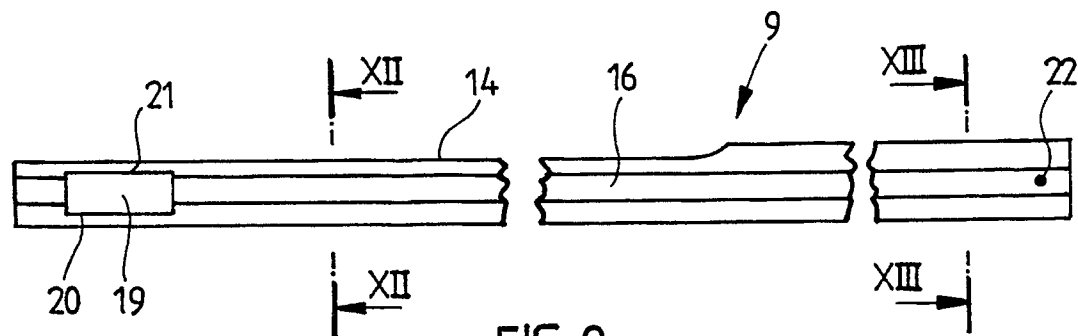


FIG. 9

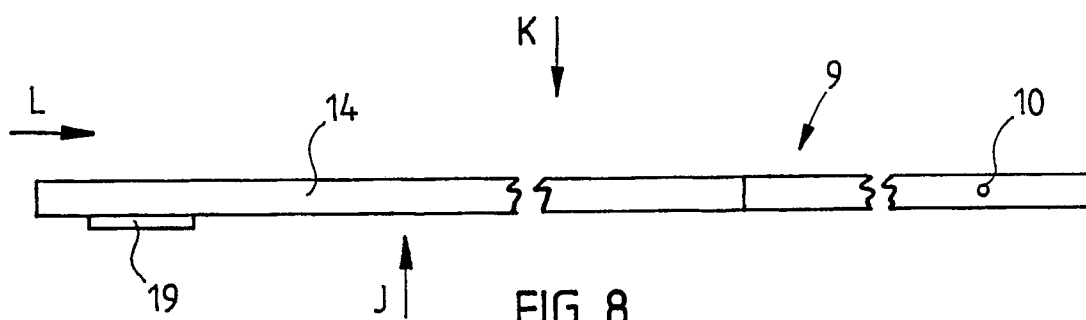


FIG. 8

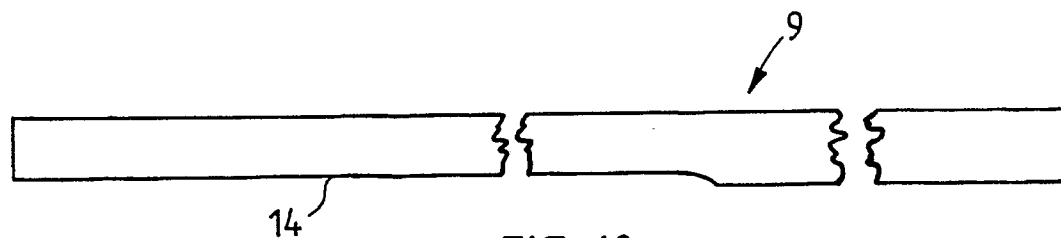


FIG. 10

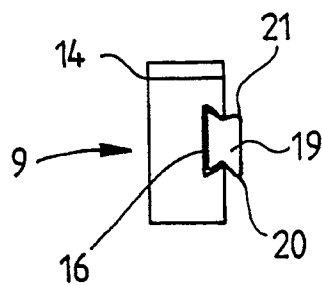


FIG. 11

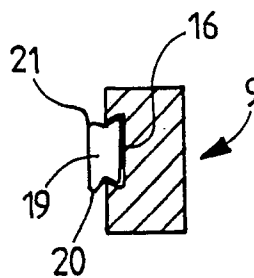


FIG. 12

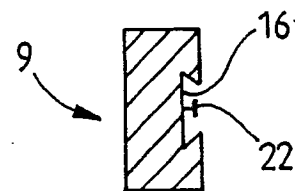


FIG. 13

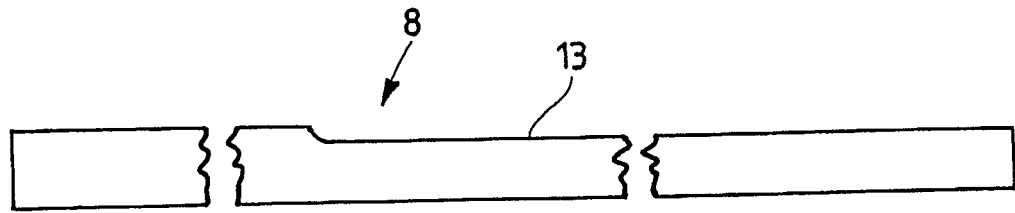


FIG. 15

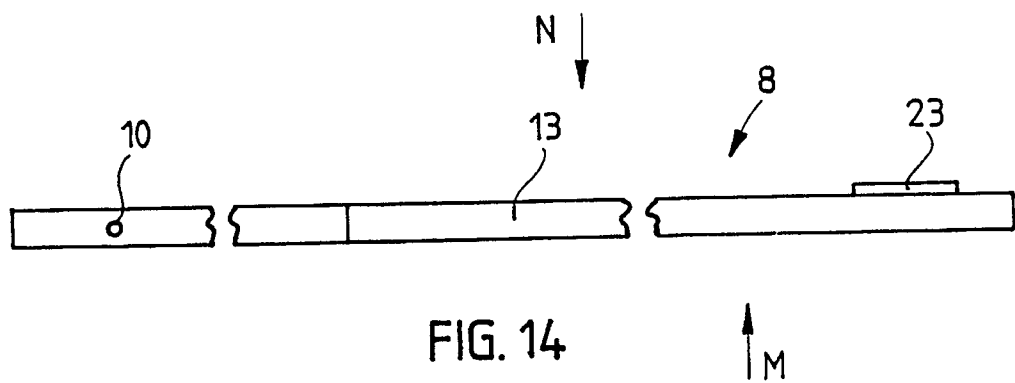


FIG. 14

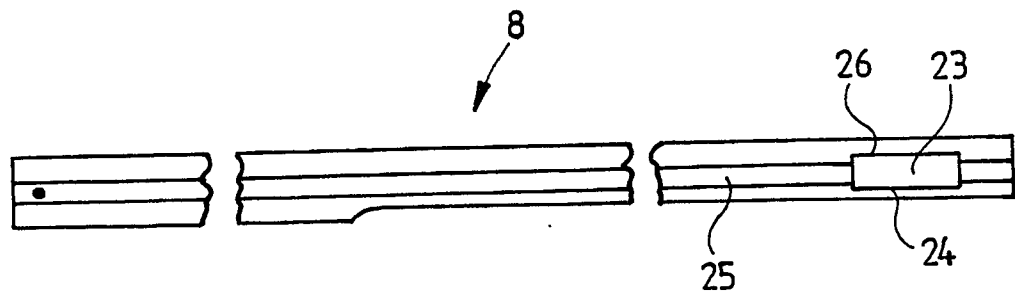


FIG. 16

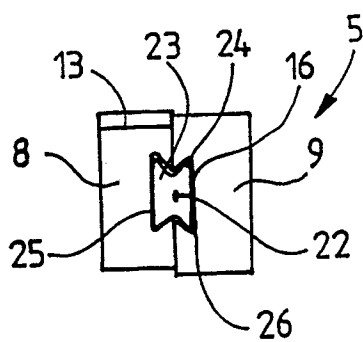


FIG. 17

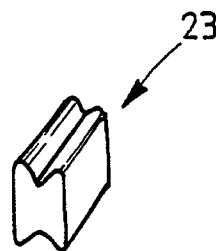


FIG. 18



FIG. 19

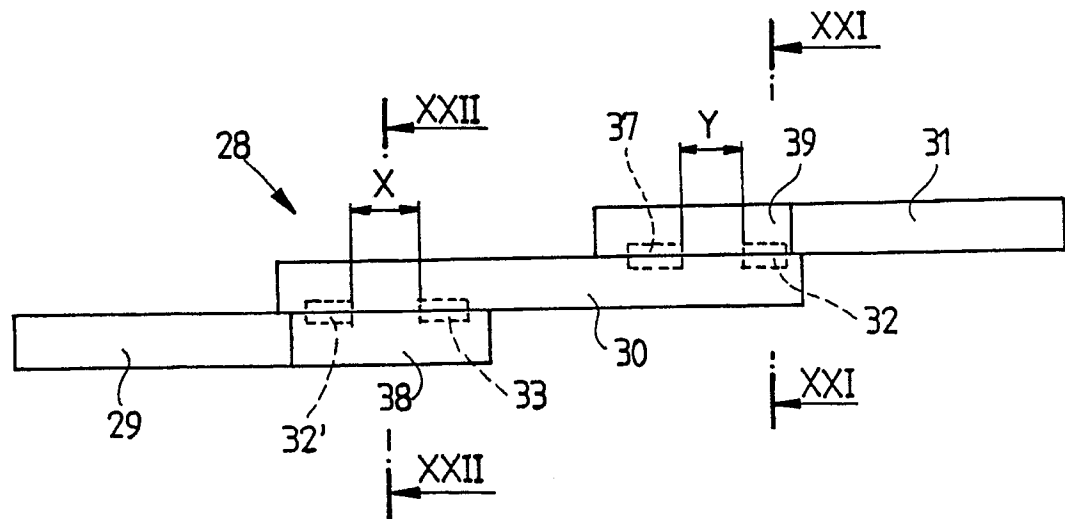


FIG. 20

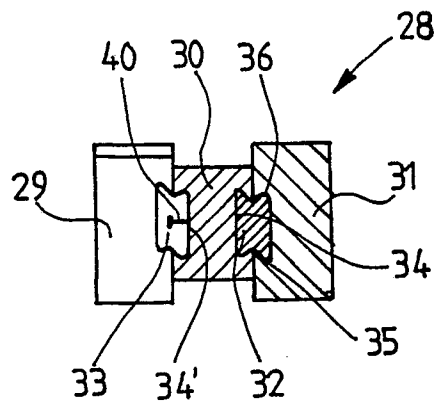


FIG. 21

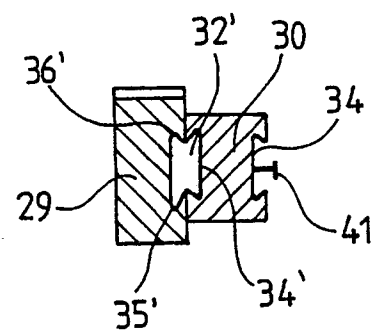


FIG. 22