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### **(54) Device for a floor**

Vorrichtung für einen Boden

Dispositif pour plancher

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(73) Proprietor: **HGB Backstrand AB  
402 34 Göteborg (SE)**

(72) Inventor: **Giorgi, Stefan  
SE-433 61, Sävedalen (SE)**

(74) Representative: **Bergentall, Annika Maria et al  
Cegumark AB  
P.O. Box 53047  
400 14 Göteborg (SE)**

(56) References cited:  
**EP-A- 0 086 897 DE-A1- 2 638 968  
SE-C2- 526 997**

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## Description

**[0001]** The present invention relates to a device for a tumbling floor, which comprises an underbody formed of foam plastic or another similar elastic material and having springy elements resting thereon, such as glass fibre tubes attached to the end portions of the underbody.

**[0002]** Tumbling floors are used within the gymnastics in order to provide a floor or another similar substratum that has good bouncing and springing properties especially for the gymnastics class or skill tumbling where gymnasts can arrive at fantastic somersaults and other jump motions, which previously not have been possible to carry out from a floor. Such a tumbling floor, which for instance is shown in SE 526 997 C2, is intended to easily be possible to be taken out and assembled, and easily be possible to be picked together after dismounting of the floor and be carried away, respectively. Such tumbling floors having steel rails become a more fixed construction, which does not need to be moved away in the hall it is used.

**[0003]** Prior art DE 26 38 968 A1 discloses an elastic tumbling floor having a spring-element on the bottom part and stretching across the floor of the bottom portion. An upperspring is connected to the underside of the upper portion of said floor. However said bottom spring element can't be embedded and protected in any compressible underbody which lightness as the bottom spring together with elastic footelements fastened to said bottom spring element forms and underbody of said heavy tumbling floor.

**[0004]** By utilizing tumbling floors comprising foam rails on which frames having transverse elastic plastic tubes rest, even children from approx. 10 year's of age can easily put out and dismount, respectively, an entire tumbling floor and also be able to carry the different parts included therein.

**[0005]** Tumbling floors, so-called POWER-TUMBLING™, in which foam rails are utilized, are used also by very big, sturdy and heavy gymnasts, which entails the risk of damaging subjacent underbodies, which are compressed and become damaged. If then underbodies of metal are utilized, the same become heavy, which entails that the floor becomes heavy and difficult to mount and dismount, respectively, and get the different parts in place for storage and use, respectively, where the gymnastics is exercised in, e.g., premises having parquet floors or plastic mat floors.

**[0006]** Therefore, the main object of the present invention is primarily to solve the problem by means of soft underbodies of foam plastic or another similar elastic material and prevent them from becoming compressed too much when they are loaded in connection with somersaults and other gymnastic jumps and exercises. Simultaneously, the problem should be solved without the parts becoming too heavy for children to move.

**[0007]** Said object is attained by means of a device according to the present invention, which essentially is

characterized in the underbody element which is denominated the reinforcement is embedded in order to decrease the compression of said compressible and resilient material in the vertical direction.

**[0008]** The invention is described in the following such as a number of preferred embodiment examples, reference being made to the accompanying drawings, in which,

- 10 Fig. 1 longitudinally shows an underbody having springy elements supported thereon,  
Fig. 2 shows a section view along the line II-II in Fig. 1,
- 15 Fig. 3 shows a view from above of a portion of a tumbling floor having springy tubular elements resting and supported on underbodies,
- 20 Fig. 4 schematically shows attachment of pair-wise springy tubular elements in a common end portion,  
Figs. 5-6 show the invention with Fig. 5 showing a cross-sectional view of a reinforced underbody,
- 25 Fig. 6 shows in perspective view obliquely from above and in cross-section a reinforced underbody, and  
Figs. 7-9 show additional pictures of the underbody and the interior thereof.

**[0009]** A device 1 for a tumbling floor 2 that comprises an underbody 3, which is formed of a common part or pair-wise parts co-operating with each other, having

30 springy elastic elements 4 laid and resting thereon, such as glass fibre tubes, that are attached with the respective ends 5, 6 to end portions 7, 8 being shown hidden in Figs. 1-4. On top of said elements 4, mats, not shown, are arranged to be spread. However, it is shown illustrated  
35 in Figs. 5-6 that the underbody 3 is formed of reinforced foam elements. In doing so, the reinforcement 9 is arranged to decrease the compression of the foam elements in the vertical direction 10. Since the springy elements 4 preferably are formed of glass fibre tubes, also  
40 the reinforcement 9 is suitably formed of such glass fibre tubes, i.e., that the glass fibre reinforcement tubes 9 have equal diameter d as each other and as the diameter D of the springy horizontally supported glass fibre tubes 4.

**[0010]** Said glass fibre reinforcement tubes 9 are arranged to extend substantially vertically 10 between the lower situated support surface 11 of the underbody 3, which is used to raise the underbody 3 on a floor 12 or another suitable substratum, and the upper situated end-portion support surface 13 of the same, onto which the  
45 respective end portion 7, 8 is laid up to be supported by the same for carrying of the springy elements 4 clamped and attached therein. Preferably, said glass fibre reinforcement tubes 9, or other similar elastic elements, extend all the way S between said surfaces 11, 13.

**[0011]** Said glass fibre reinforcement tubes 9 are preferably evenly distributed along the length extension L of the respective foam element, for instance at a distance A of some decimetres and approximately right opposite

where the end portions 7, 8 of the springy elements 4 will rest in the mounted position I, e.g., from a step 14 and downward.

**[0012]** In order for the glass fibre reinforcement tubes 9 to be properly fixed to the underbody 3, they may be glued on in holes 15 therein by means of a suitable glue 16. These may also be embedded into the foam material of said underbody, i.e., the foam elements 3.

**[0013]** To sum up, it may be said that the underbody 3 is formed of reinforced compressible resilient material and which reinforcement 9 is arranged to decrease the compression of compressible and resilient materials in the vertical direction 10. There, said reinforcement may be formed of stiff or resilient material and/or elements embedded therein, in the material of the underbody 3. Another equivalent material than glass fibre and foam material, respectively, may naturally be used for the reinforcement 9 and the underbody 3, respectively, e.g., rubber material being solid or hollow.

**[0014]** As reinforcement 9, stiffer material than glass fibre tubes may also be used, which upon fixed clamping in the lower end thereof will work as a fixed clamped standing beam, e.g., if it only is cast or glued at the bottom of the underbody 3.

**[0015]** Wood and other light material may come to be used as reinforcement, either as individual inserted pieces or as a common framework.

**[0016]** The function and nature of the invention should have been understood from the above-mentioned and with the aid of the accompanying figures, but the invention is naturally not limited to the embodiments described above and shown in the accompanying drawings. Modifications are feasible, particularly as for the nature of the different parts, or by using an equivalent technique, without departing from the protection area of the invention, such as it is defined in the claims.

## Claims

1. Device (1) for a tumbling floor (2), which comprises an underbody (3) formed of foam plastic or another similar elastic material and having springy elements (4) resting thereon, such as glass fibre tubes attached to the end portions (7, 8) of the underbody (3), **characterized in that** reinforcement elements (9) are embedded in the underbody (3) in order to decrease the compression of said compressible and resilient material in the vertical direction (10).
2. Device according to claim 1, **characterized in that** said element (9), is formed of glass fibre tubes.
3. Device according to claim 2, **characterized in that** glass fibre reinforcement tubes (9) are arranged to extend substantially vertically (10) between the lower support surface (11) and upper end portion support surface (13) of the underbody (3).

4. Device according to claim 3, **characterized in that** said the glass fibre reinforcement tubes (9) extend all the way (s) between said surfaces (11, 13).

5. Device according to any one of the preceding claims 2-4, **characterized in that** said glass fibre reinforcement tubes (9) are distributed along the length extension (L) of the respective foam element (3).

10. 6. Device according to claim 5, **characterized in that** the glass fibre reinforcement tubes (9) are evenly distributed.

15. 7. Device according to any one of the preceding claims 2-6, **characterized in that** the reinforcing glass fibre tubes (9) have equal diameter (d) as each other and preferably equal diameter (D) as the horizontally supported glass fibre tubes (4).

20. 8. Device according to any one of the preceding claims 3-7, **characterized in that** the glass fibre reinforcement tubes (9) are glued on and/or embedded in said foam elements (3).

25. 9. Device according to claim 1, **characterized in that** stiffer material than glass fibre tubes is fixedly clamped in the lower end thereof to the underbody (3) in order to work as a fixedly clamped standing beam, by the fact that they are cast or glued on in the lower part of the underbody (3).

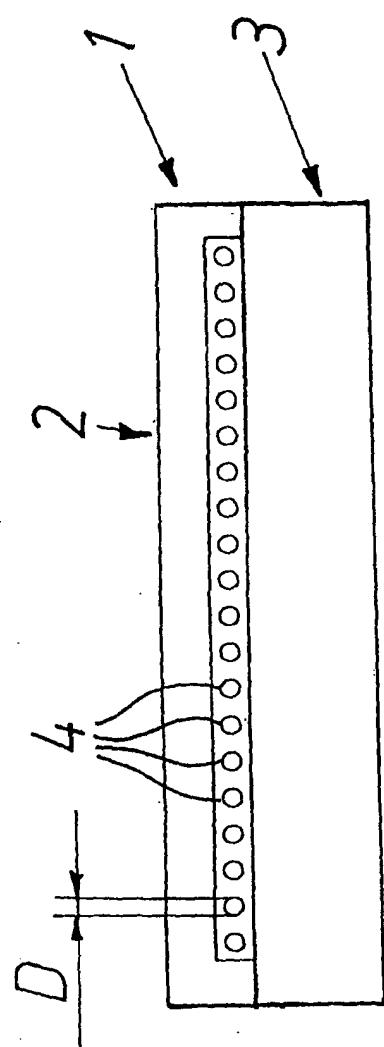
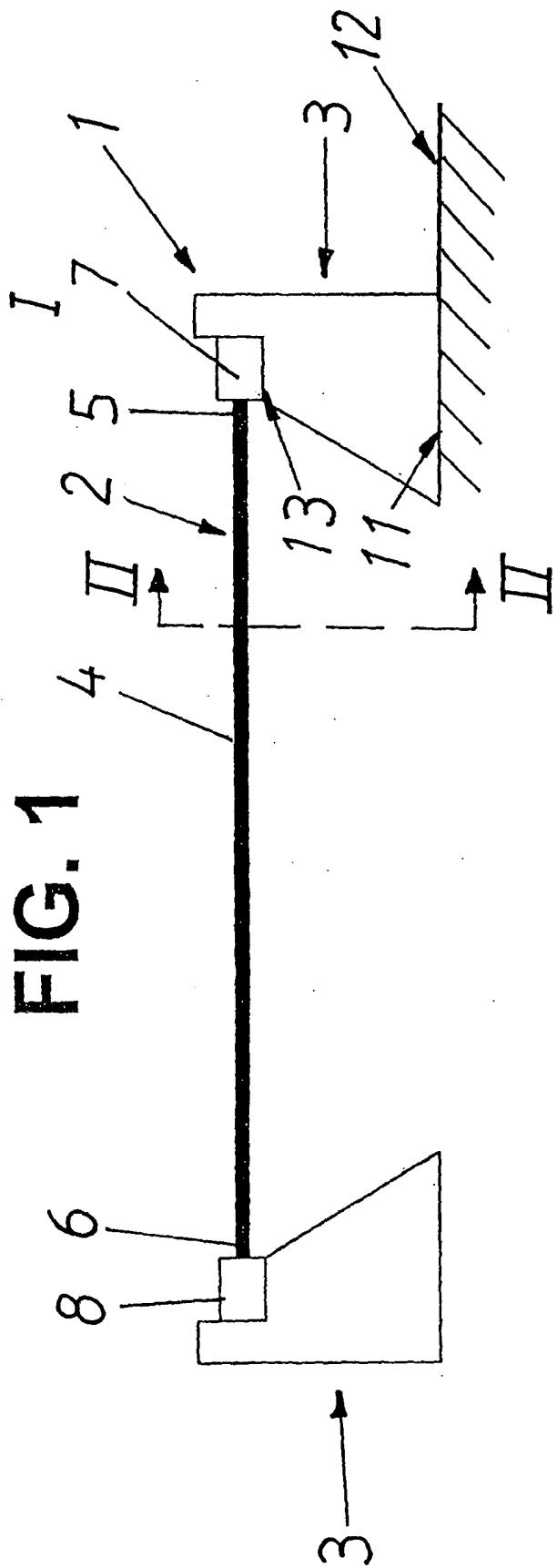
## Patentansprüche

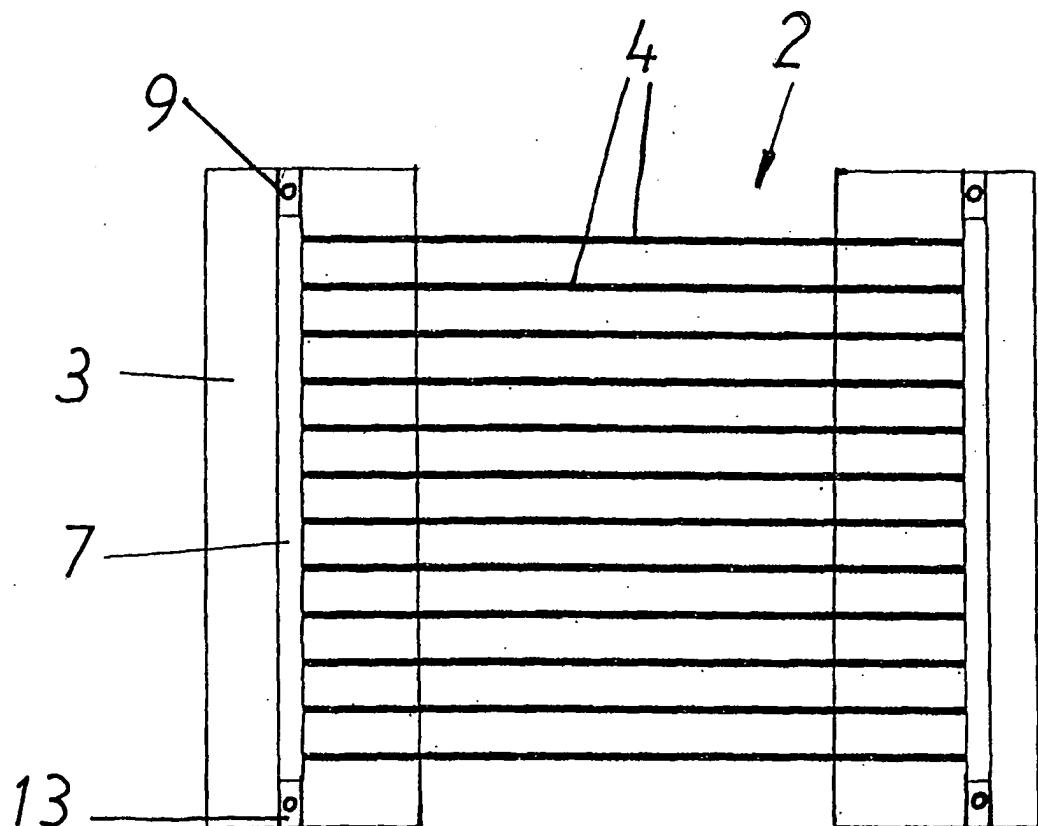
35. 1. Vorrichtung (1) für eine Tumblingbahn (2), die einen Unterbau (3) umfasst, der aus Schaumkunststoff oder einem anderen ähnlichen elastischen Material geformt ist und darauf ruhende Federelemente (4), wie Glasfaserrohre, aufweist, die an den Endabschnitten (7, 8) des Unterbaus (3) befestigt sind, **dadurch gekennzeichnet, dass** Verstärkungselemente (9) in dem Unterbau (3) eingebettet sind, um die Kompression des komprimierbaren und nachgiebigen Materials in der vertikalen Richtung (10) zu vermindern.
40. 2. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** das Element (9) aus Glasfaserrohren geformt ist.
45. 3. Vorrichtung nach Anspruch 2, **dadurch gekennzeichnet, dass** die Glasfaser verstärkungsrohre (9) derart angeordnet sind, dass sie sich im Wesentlichen vertikal (10) zwischen der unteren Lagerfläche (11) und der oberen Endabschnittslagerfläche (13) des Unterbaus (3) erstrecken.

4. Vorrichtung nach Anspruch 3,  
**dadurch gekennzeichnet, dass**  
die Glasfaserverstärkungsrohre (9) sich entlang des gesamten Weges/der gesamten Wege zwischen den Flächen (11, 13) erstrecken.
5. Vorrichtung nach einem der vorhergehenden Ansprüche 2 - 4,  
**dadurch gekennzeichnet, dass**  
die Glasfaserverstärkungsrohre (9) entlang der Längenausdehnung (L) des jeweiligen Schaumelements (3) verteilt sind.
6. Vorrichtung nach Anspruch 5,  
**dadurch gekennzeichnet, dass**  
die Glasfaserverstärkungsrohre (9) gleichmäßig verteilt sind.
7. Vorrichtung nach einem der vorhergehenden Ansprüche 2 - 6,  
**dadurch gekennzeichnet, dass**  
die Verstärkungsglasfaserrohre (9) einen gleichen Durchmesser (d) untereinander und bevorzugt einen gleichen Durchmesser (D) wie die horizontal gelagerten Glasfaserrohre (4) besitzen.
8. Vorrichtung nach einem der vorhergehenden Ansprüche 3 - 7,  
**dadurch gekennzeichnet, dass**  
die Glasfaserverstärkungsrohre (9) an die Schaumelemente (3) geklebt und/oder in diese eingebettet sind.
9. Vorrichtung nach Anspruch 1,  
**dadurch gekennzeichnet, dass**  
Material, das steifer als die Glasfaserrohre ist, fest in deren unterem Ende an den Unterbau (3) geklemmt ist, um als ein fest geklemmter stehender Träger zu dienen, und zwar durch die Tatsache, dass sie in den unteren Teil des Unterbaus (3) gegossen oder geklebt sind.
3. Dispositif selon la revendication 2, **caractérisé en ce que** les tubes de renforcement (9) en fibre de verre sont disposés de manière à s'étendre essentiellement verticalement (10) entre la surface de soutien inférieure (11) et la surface de soutien (13) de la partie terminale supérieure de l'infrastructure (3).
4. Dispositif selon la revendication 3, **caractérisé en ce que** lesdits tubes de renforcement (9) en fibre de verre s'étendent sur toute la distance (S) entre lesdits surfaces (11, 13).
5. Dispositif selon l'une quelconque des revendications précédentes 2 à 4, **caractérisé en ce que** lesdits tubes de renforcement (9) en fibre de verre sont répartis le long de l'étendue en longueur (L) de l'élément en mousse respectif (3).
6. Dispositif selon la revendication 5, **caractérisé en ce que** les tubes de renforcement (9) en fibre de verre sont régulièrement répartis.
7. Dispositif selon l'une quelconque des revendications précédentes 2 à 6, **caractérisé en ce que** les tubes de renforcement (9) en fibre de verre possèdent des diamètres (d) identiques entre eux et de préférence identiques au diamètre (D) des tubes (4) en fibre de verre soutenus horizontalement.
8. Dispositif selon l'une quelconque des revendications précédentes 3 à 7, **caractérisé en ce que** les tubes de renforcement (9) en fibre de verre sont collés et/ou incorporés dans lesdits éléments en mousse (3).
9. Dispositif selon la revendication 1, **caractérisé en ce qu'un** matériau plus rigide que les tubes en fibre de verre est fixé par serrage à l'infrastructure (3) dans son extrémité inférieure afin de jouer le rôle de montant vertical fixé par serrage, par le fait qu'ils sont moulés ou collés dans la partie inférieure de l'infrastructure (3).

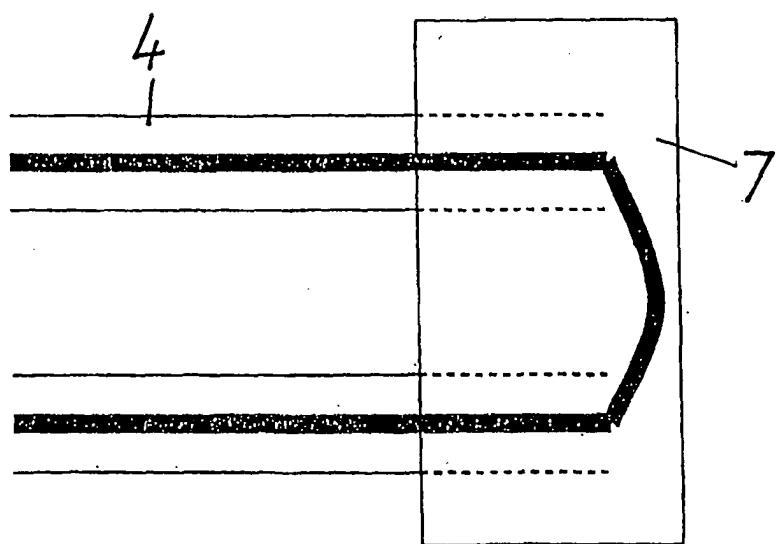
## Revendications

1. Dispositif (1) pour un plancher de tumbling (2), qui comprend une infrastructure (3) réalisée en plastique mousse ou autre matériau élastique analogue et sur laquelle reposent des éléments (4) à effet de ressort, tels que des tubes en fibre de verre fixés aux parties terminales (7, 8) de l'infrastructure (3), **caractérisé en ce que** des éléments de renforcement (9) sont incorporés dans l'infrastructure (3) afin de diminuer la compression en direction verticale (10) dudit matériau compressible et résilient.
2. Dispositif selon la revendication 1, **caractérisé en ce que** ledit élément (9) est formé de tubes en fibre

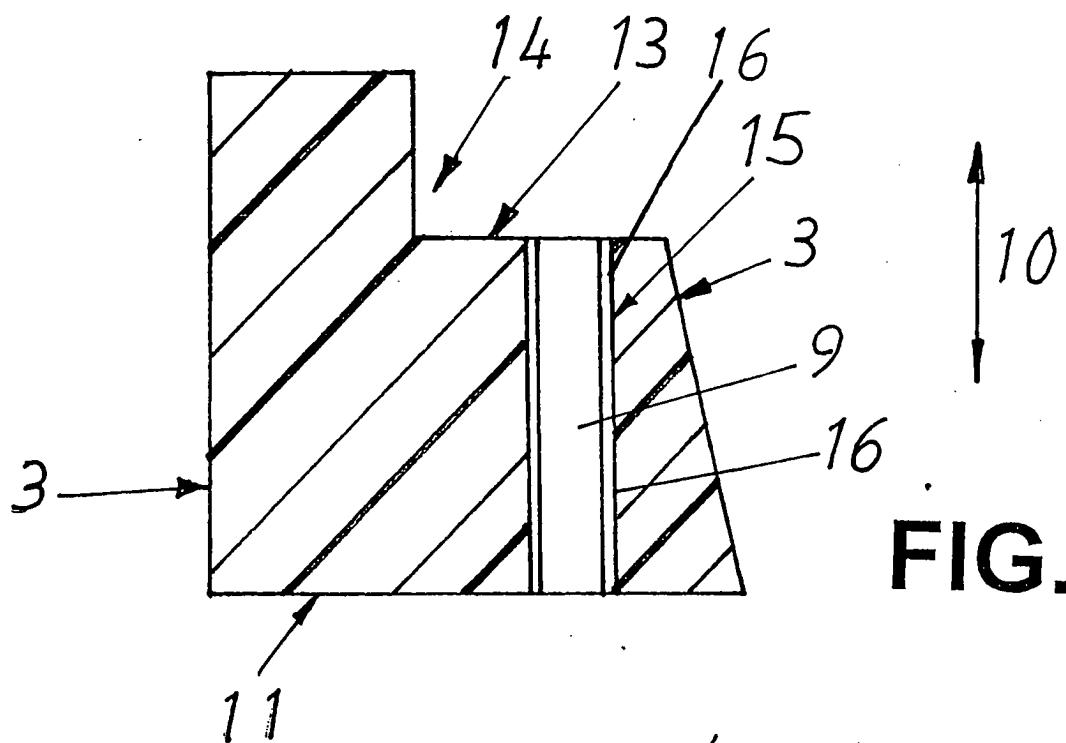
**FIG. 1****FIG. 2**



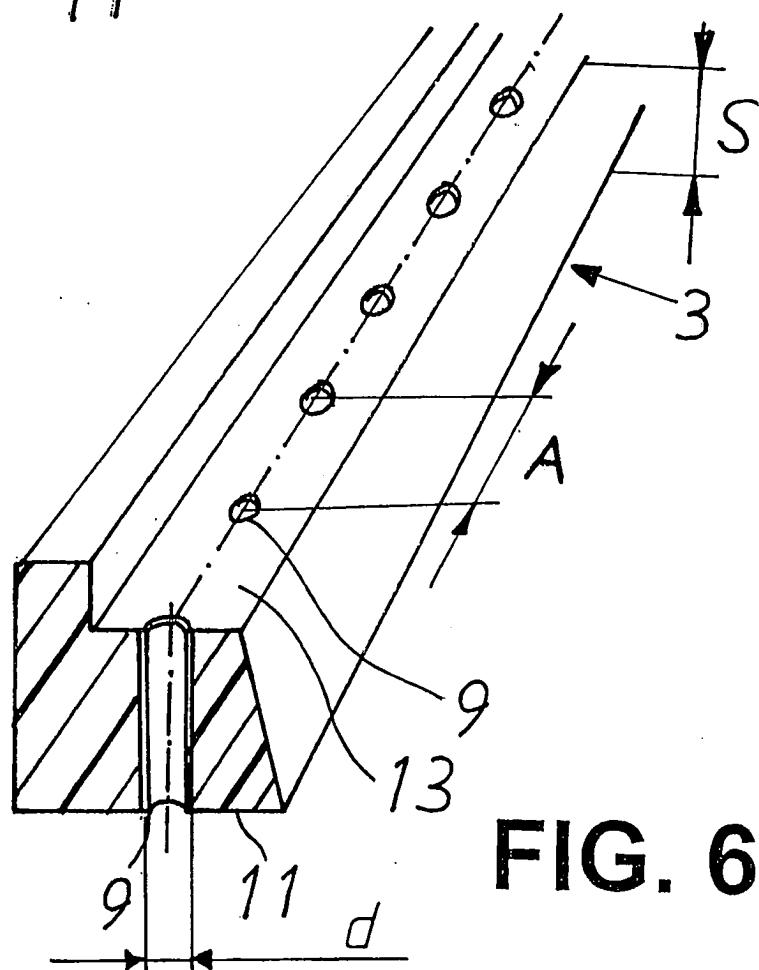
**FIG. 3**



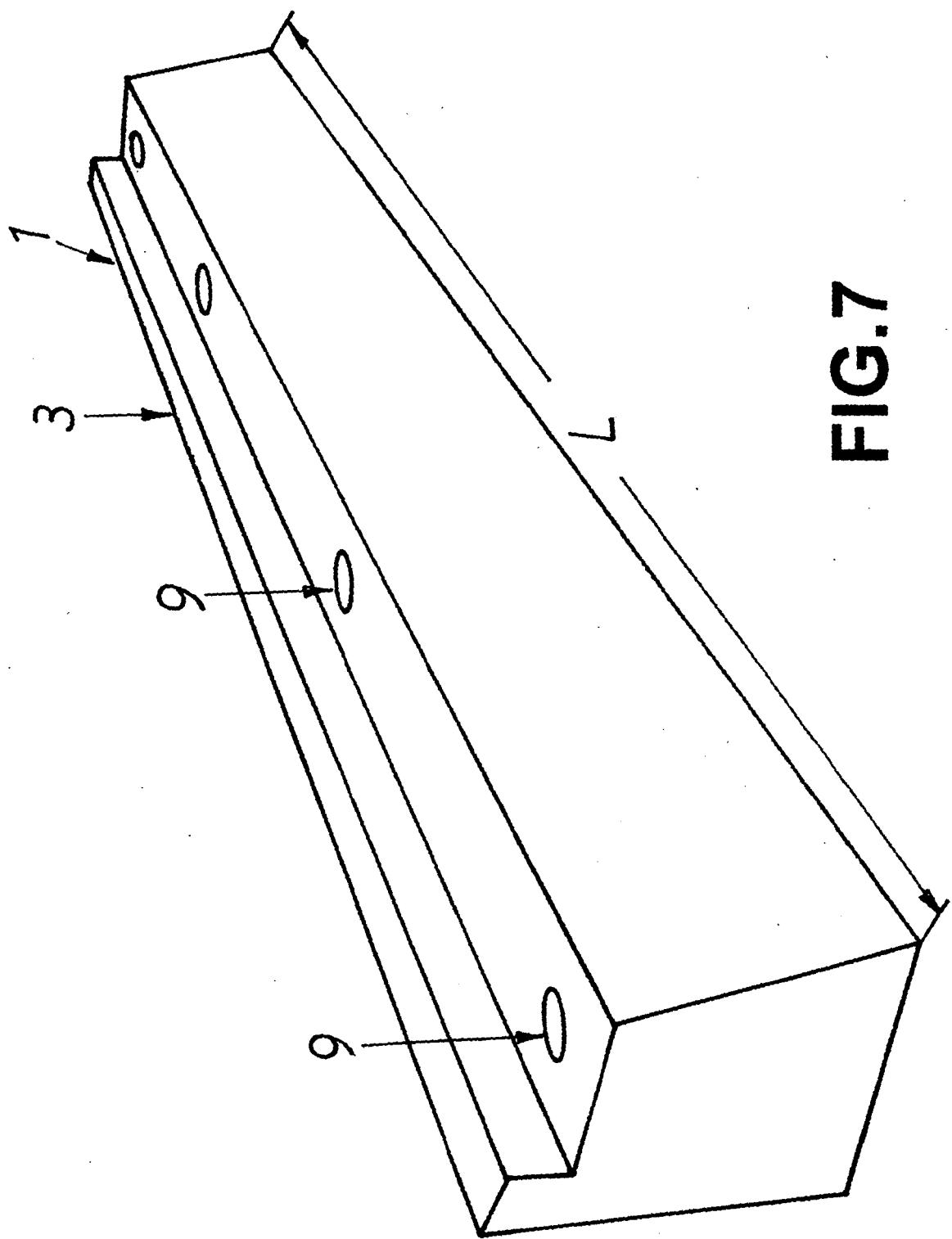
**FIG. 4**

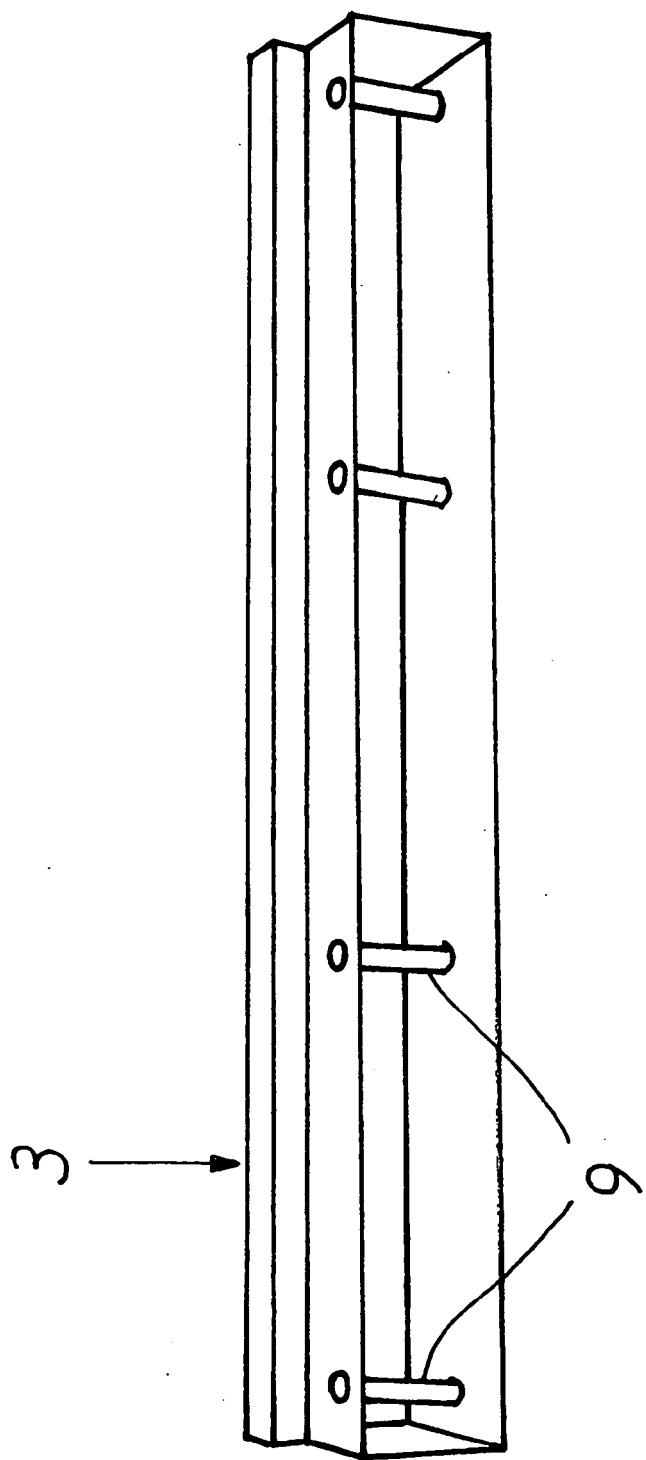


**FIG. 5**

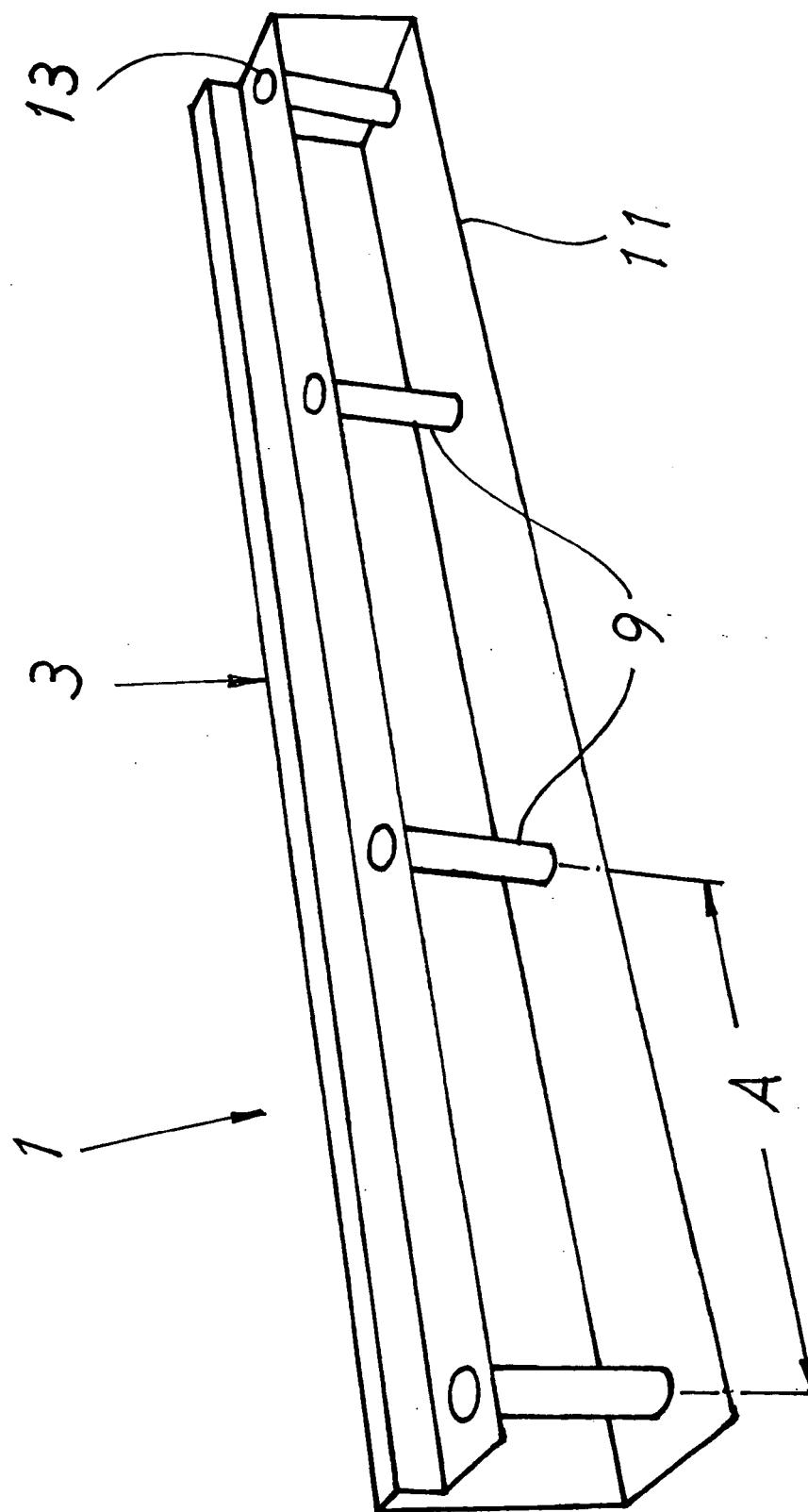


**FIG. 6**





**FIG.8**



**FIG.9**

**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

- SE 526997 C2 [0002]
- DE 2638968 A1 [0003]