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(54) **A protective fence for woodworking machinery, especially for shaper machines**

(57) The fixed wall (1) of the protective fence forms, for each rod (12), a guide (3) that engages in a longitudinal seat (14) formed in the rod (12); the rods (12) are

contiguous to each other, so that the protection in the aperture corresponding to the tool is formed with an outline closely approximating to the shape of the tool.

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Description

[0001] The prior art includes protective fences for woodworking machinery (especially for shaper machines) that comprise a wall forming a window and having means for defining outlines which reproduce in reverse the outline of the tool assembly. These means create a stepped shape which when compared with the shape of the tool (from which the operator is to be protected) leaves gaps such that the protection they provide is not always adequate. Said means may take the form of sliding rods that can be locked in position with individual screw members, a time-consuming operation.

[0002] These drawbacks are avoided with the guide fence according to the present invention, which also offers other advantages that will become evident upon perusal of the following text.

[0003] According to the invention, the wall forms, for each rod, a guide that engages in a longitudinal seat formed in the rod; in addition the rods are contiguous to each other, so that the protection in the aperture or window is formed with an outline closely approximating to the ideal protective shape around the tool.

[0004] Advantageously, the longitudinal seats in the rods and the guides of the wall offer a small amount of clearance; in addition the locking means take the form of screw means acting on that rod which is situated in the outermost position. By this means a single operation compresses the rods against each other through their mutually adjacent surfaces.

[0005] The adjacent surfaces of contiguous rods have complementary interlocking longitudinal profiles having inclined surfaces, and this causes the rods to lock together when clamped by the screw means.

[0006] Said longitudinal profiles may be V shaped.

[0007] The guides and the seats may have profiles of part-circular section, or prismatic profiles with surfaces approximately parallel to the wall.

[0008] A clearer understanding of the invention will be gained from the description and the attached drawing, the latter showing a practical and non-restrictive example embodiment of the invention. In the drawing:

Fig. 1 shows a simplified front view of the fence as a whole;

Fig. 2 shows a sectioned partial perspective view of the fence;

Figs 3 and 4 show the main components of the fence separately in an exploded section, and an enlarged detail;

Fig. 5 shows in isolation a side piece fixed to and acting on the sliding rods; and

Figs 6 and 7 show a variant in views corresponding to Figs 3 and 4.

[0009] As illustrated in the accompanying drawing, the fence to be attached to the machine consists of a shaped section 1 which is large in the vertical direction

and at right angles to the direction f in which the work is slid along said machine; this shaped section 1 forms on the wall 1A a series of guides 3 in the form of enlarged projections, of basically cylindrical shape, on necks connecting them to the wall itself. The shaped section 1 has a lower wall 5 containing a V-section groove 5A, while an upper wall 7 is smooth and has at least two tapped holes 9 for fixing screws, as will be explained later.

[0010] Shown at 12 are the rods designed to slide along the guides 3. These rods have a cross section whose global form is basically rectangular with a longitudinal cavity 14 that corresponds to the form of the guides 3, though slightly larger in order to give a very small amount of clearance between the rods 12 and the guides 3. Along the top of each rod 12 runs a channel 12A that corresponds to the groove 5A in the lower wall 5, while a rib 12B whose form corresponds in reverse to the channel 12A also runs along the bottom of each rod 12. These channels 12A and ribs 12B and the groove 5A constitute interlocking longitudinal profiles with inclined surfaces that ensure mutual contact for their transverse positioning while allowing each rod to slide longitudinally with respect to the contiguous rod or rods, the rib 12B of the bottommost rod 12X engaging in the groove 5A in the wall 5, which corresponds to the channel 12A of each of the rods. These channels 12A and ribs 12B and the groove 5A have a basic V profile which helps them to nest centrally together. All the rods 12, when mounted - by inserting them lengthwise - on the guides 3 come into general contact with the opposing lateral surfaces, and can be compressed simultaneously against each other because of the clearance which the seats 14 have with respect to the guides 3, compression being applied from the top down so that they press against the lower wall 5. To produce this compression and therefore lock the rods relative to each other it is sufficient to have screw means or set screws engaged in the tapped holes 9. Only two such screws, appropriately positioned, may be sufficient to provide the compression and locking of the rods in the vertical direction and at right angles to the rods themselves. In practice, all that is required is two screw means engaged in the holes 9 in positions such as to act on the rods, however they may be positioned along the guides 3 so as to make up the protective fence shaped to match the router tool around which the assembly described is to provide protection.

[0011] As stated above, the rods 12 are essentially in sliding contact and in compressive contact relative to each other. In these conditions, when the individual rods are free to slide relative to each other and all rods relative to the corresponding guides 3, they are adjusted so as to project to a greater or lesser distance into the window F defined by the two contiguous shaped sections 1 mounted at a distance from each other on the table P, which is to take the workpiece which will be slid along this table. Once the positions of the individual rods have been defined, such that they project to a greater or less-

er degree into the window F so as to shield the greater part of the profile of the working tool, around which a protection is to be provided for the operator, the rods are locked in place by tightening the screw means indicated at 18, of which only two are needed in practice for each of the two sections of the fence 1 in order to effectively lock all the rods in their desired positions. All the rods can be released by slackening off the screw means or set screws 18 in the holes 9 of the upper walls 7 of the two contiguous shaped sections 1 defining the window F.

[0012] The operations of locking and unlocking of the sliding sticks in order to adapt them and to release them to move them to different positions is very quick and simple in practice as indicated above because of the use of the screw means 18 which serve to simultaneously lock the entire bank of rods in contact with each other. The profile of the lower end of these screw clamping means may correspond to the profile of the channel 12A of the topmost rod, so as to act on said rod and center it, and therefore all the rods together, by means of their interlocking longitudinal profiles represented by the channels 12A and ribs 12B.

[0013] A side piece marked 20 and shown in isolation in Fig. 5 can be attached to the shaped section 1A of the wall, on each of the vertical boundaries of the window F. This side piece at least partly reproduces the profile of the guides 3 and cavities 14 and is fixed by some suitable means. The side piece 20 has many functions: it exerts a slight braking action on the rods to prevent them from being slid spontaneously by friction with a contiguous rod being moved to a new position; it obstructs the penetration of dust and particles between the guides 3 and the cavities 14; and it prevents free transverse movements of the rods, which would otherwise be possible because of the clearances provided between the guides 3 and the cavities 14 to enable the simultaneous clamping of the rods by the set screws 10. Spring means may also be provided to give compressive reaction between the upper wall 7 and the rod 12Y.

[0014] In the variant illustrated in Figs 6 and 7, where references are as in Figs 3 and 4 but increased by "100", the shaped section 101 comprises a series of guides 103 that project from the wall 101A and become larger with a generally prismatic cross section with at least one face 103A parallel to the wall 101A. The rods 112 correspondingly have a longitudinal cavity 114 whose cross section corresponds to that of the guides 103, with extensions 114A to define the longitudinal cavity 114 in the space between the wall 101A and the face 103A. There is minimal tolerance between said space and said extension 114A to ensure that in practice there is no possibility of transverse movement of the rods 112 relative to the wall 101A in the direction indicated by the double arrow F6.

[0015] This arrangement ensures a precise positioning of rods 112 and a greater precision in the operations performed by the machine is possible. Furthermore the

machining of rods 112, wall 101A and guides 103 is simpler and the above mentioned tolerance can be reduced to a minimum.

[0016] The section of guides 103 and cavities 114 are advantageously preferably rectangular.

[0017] It will be understood that the drawing shows only an illustrative embodiment purely by way of a practical demonstration of the invention, which can be varied in its shapes and arrangements without thereby departing from the scope of the concept on which the invention is based. The presence of any reference numerals in the appended claims is for the purpose of facilitating the reading of the claims with reference to the description and drawing, and does not limit the scope of protection represented by the claims.

Claims

1. A protective fence for woodworking machinery, especially for shaper machines, comprising a wall forming guides along which protective rods can be slid in both parts of the fence that lie on either side of the aperture corresponding to the tool, around which the rods create a guard, means being provided to lock the rods in position, **characterized in that** said wall (1) forms, for each rod (12), a guide (3) that engages in a longitudinal seat (14) formed in the rod (12); and **in that** the rods (12) are contiguous to each other, so that the protection in the aperture or window (F) is formed with an outline closely approximating to the ideal protective shape around the tool.
2. Protective guide fence as claimed in claim 1, **characterized in that:** the longitudinal seats (14) in the rods (12) and the guides (3) of the wall (1) offer a small amount of clearance; and **in that** the locking means take the form of screw means or set screws (18) which, by acting on the outermost rod (10), compress the rods (12) against each other through their mutually adjacent surfaces.
3. Protective guide fence as claimed in claim 1 or 2, **characterized in that** the adjacent surfaces of contiguous rods (12) have interlocking longitudinal profiles (12A, 12B) with inclined surfaces, causing the rods to engage to one another.
4. Protective guide fence as claimed in claim 3, **characterized in that** said longitudinal profiles (12A, 12B) are V shaped.
5. Protective guide fence as claimed in at least one of the preceding claims, **characterized in that** the guides (3) and the seats (14) have circular-section profiles.

6. Protective guide fence as claimed in at least one of claims 1-4, **characterized in that** the guides (103) and the seats (114) are of substantially prismatic section.
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7. Protective guide fence as claimed in claim 6, **characterized in that** said section is approximately rectangular.
8. Protective guide fence as claimed in claim 6 or 7, **characterized in that** said guides (103) and said seats (114) are each provided with a contacting surface approximately parallel to the wall (101A) of the shaped section (101).
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9. Protective guide fence as claimed in at least one of the preceding claims, **characterized in that** it includes side pieces (20) that act between the wall and the rods to create a certain friction on the rods and to obstruct the penetration of dust and particles between the guides and the rods.
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Fig. 1

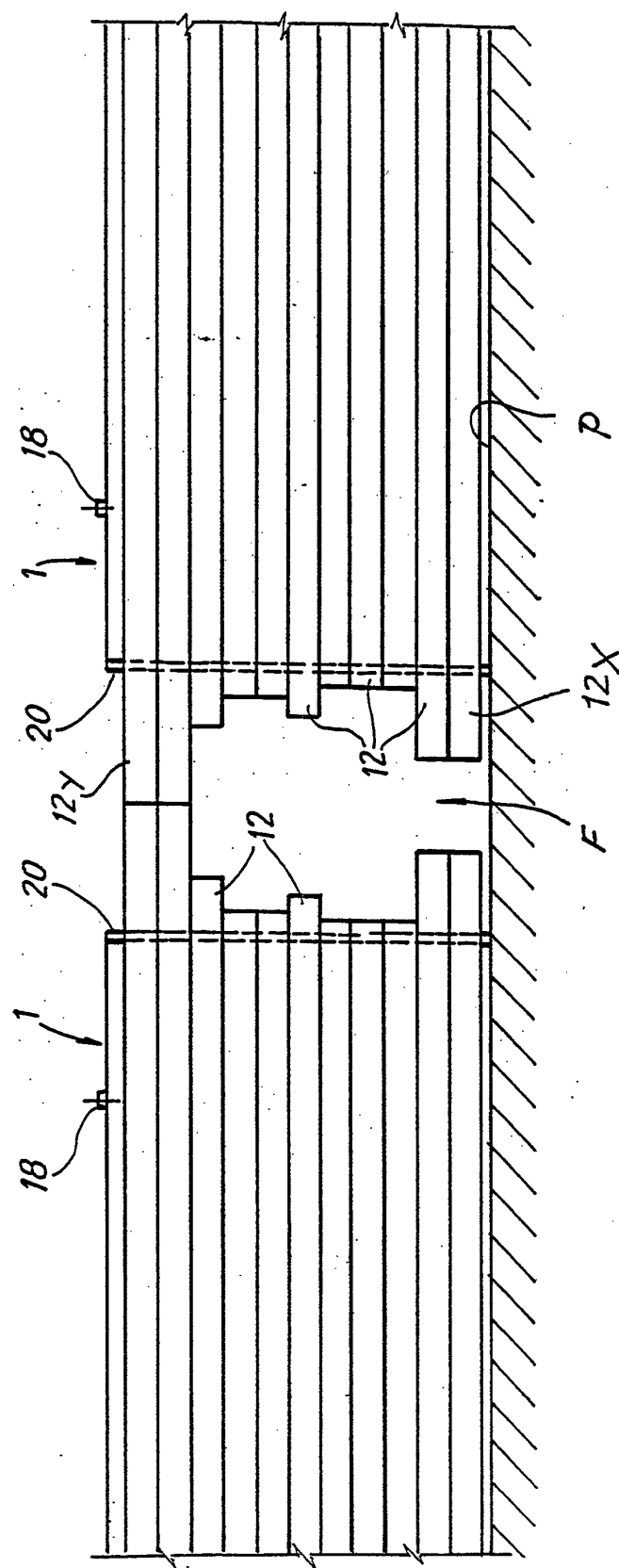


Fig.2

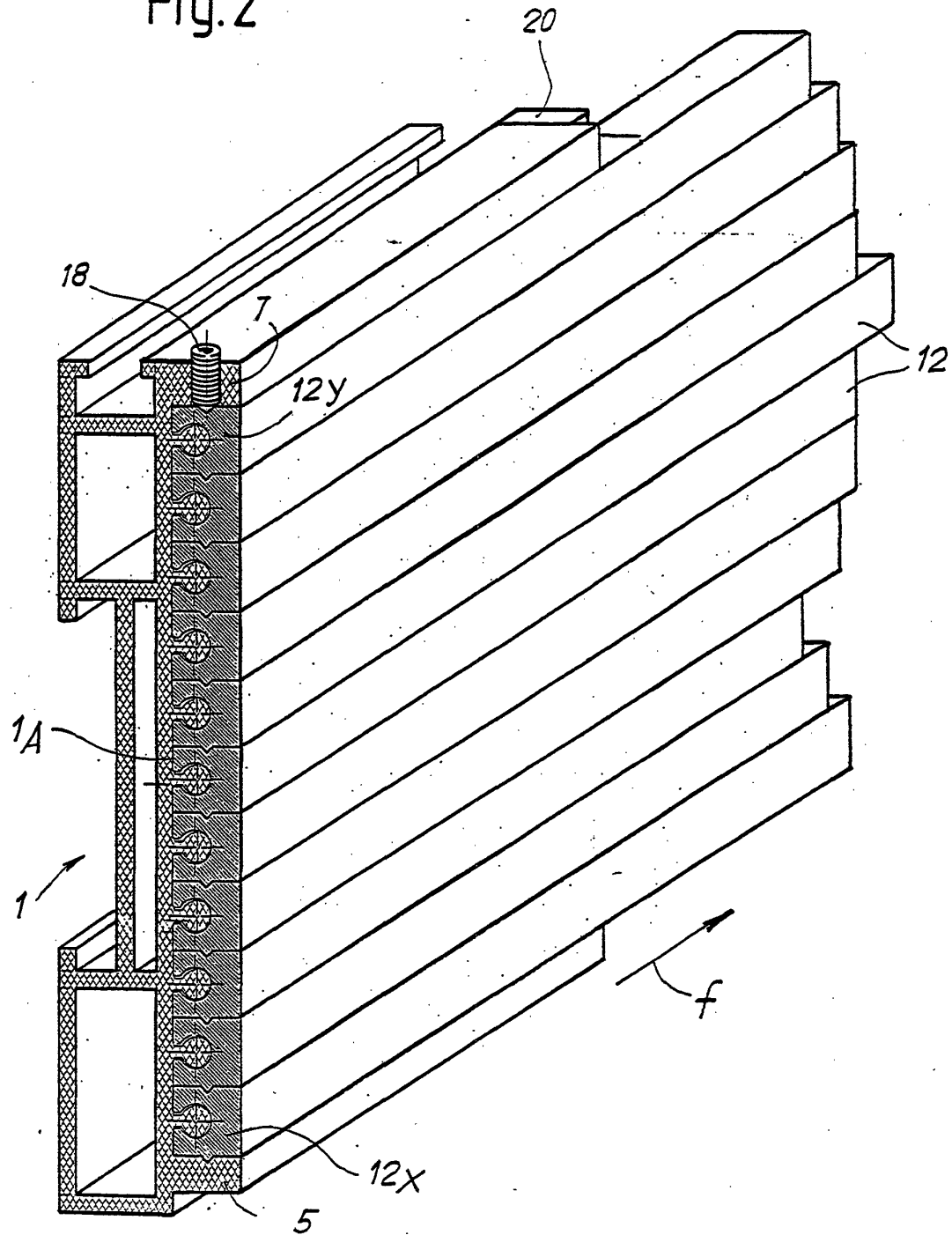


Fig.3

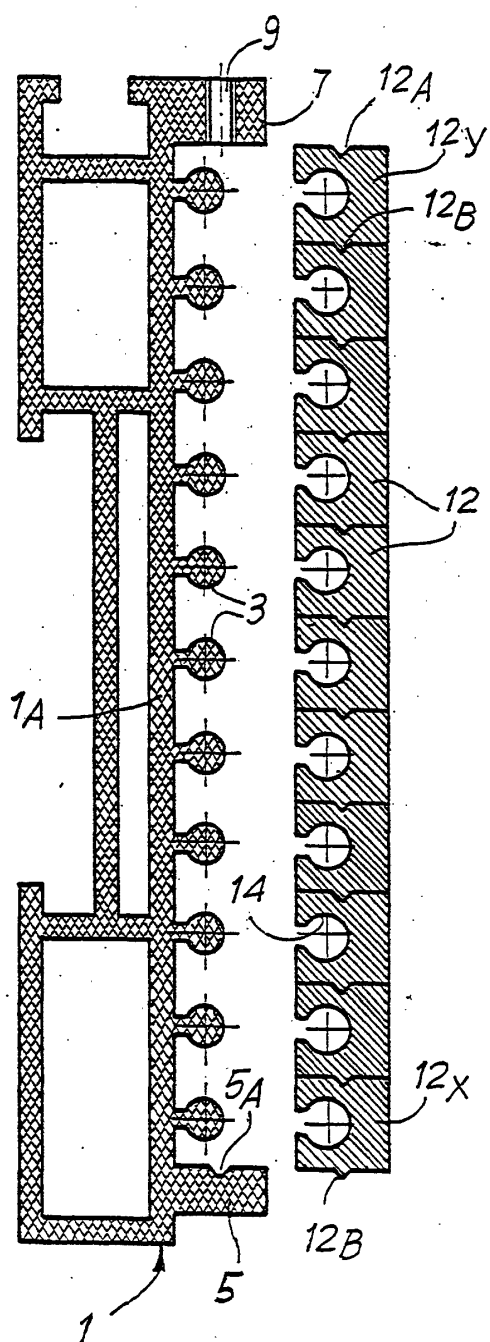


Fig.5

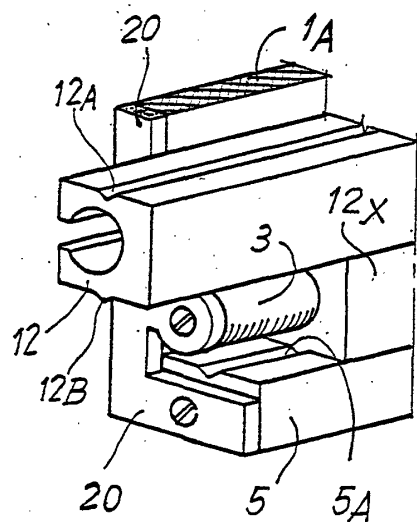
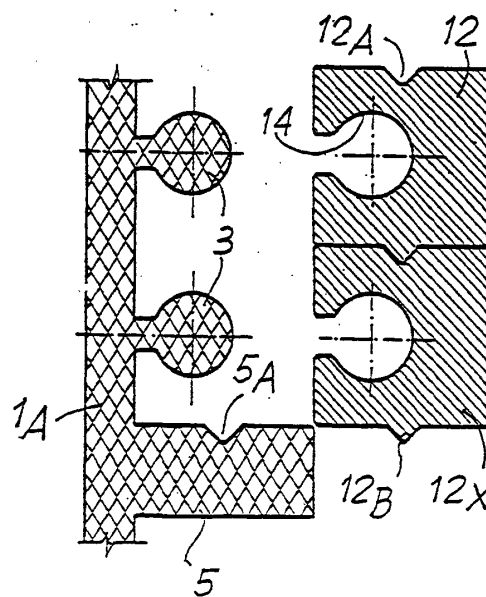


Fig.4



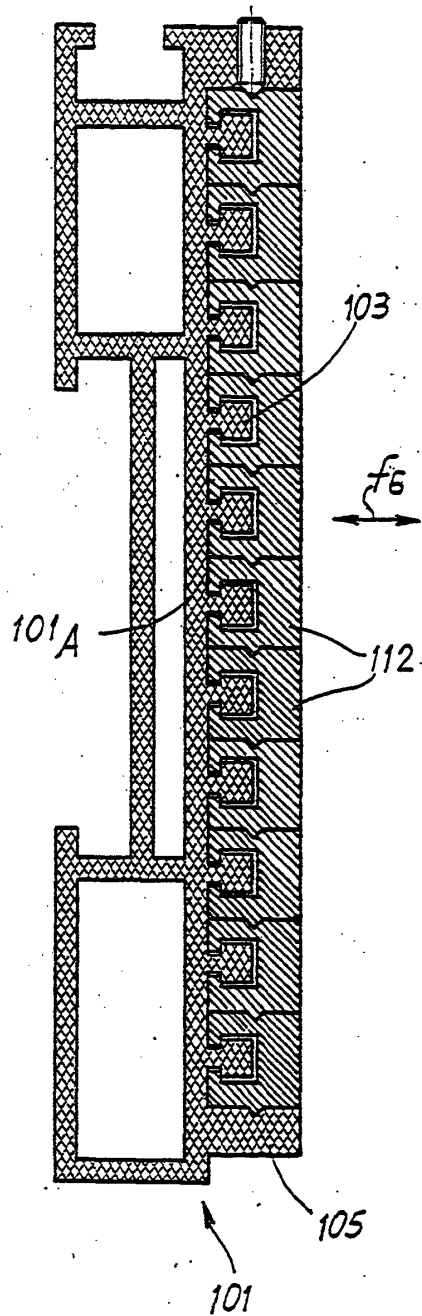


Fig. 6

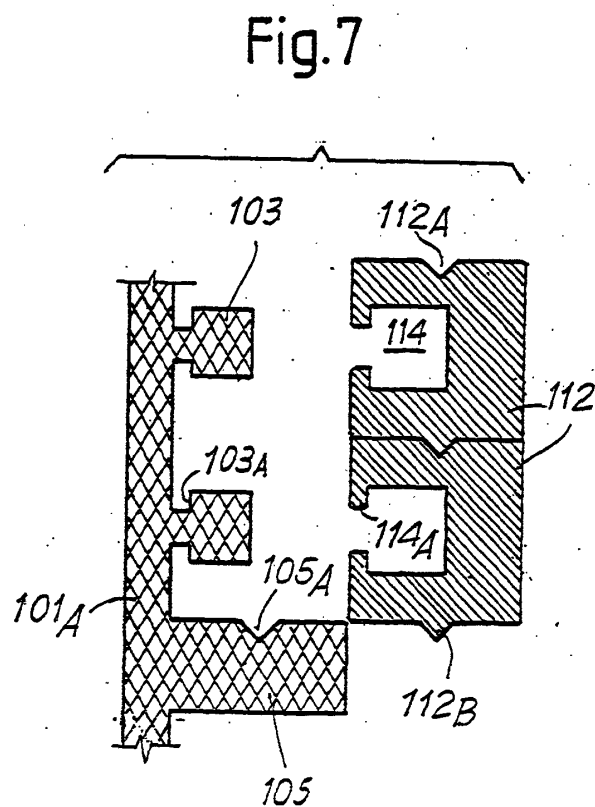


Fig. 7