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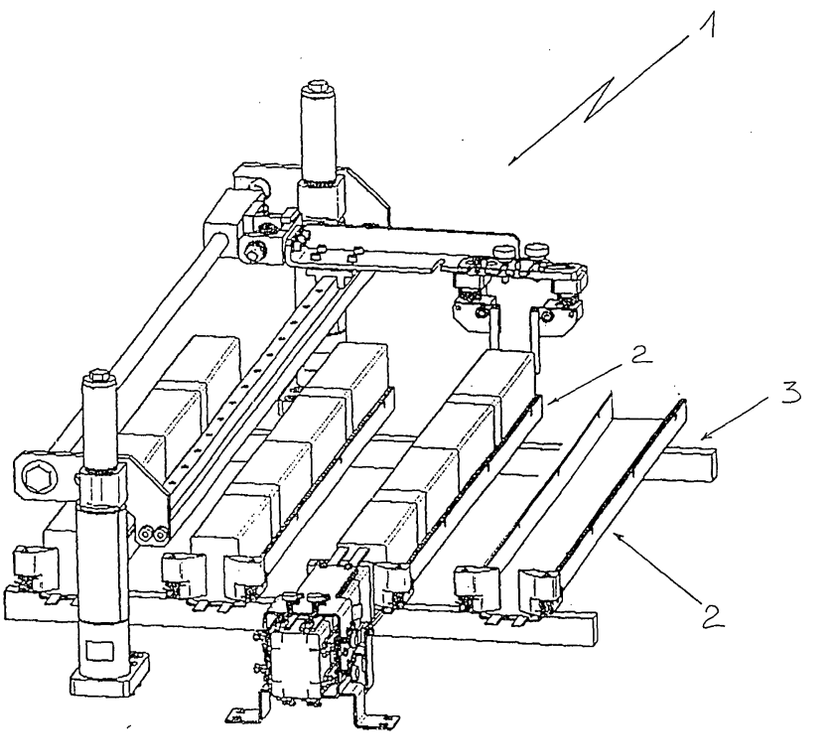
(54) Label magazine, in particular for labelling machines

(57) Label magazine (1), in particular for labelling machines, of the type comprising a plurality of loaders (2) positioned side by side on a support structure associated to the magazine (1), means (6) for moving the loaders (2) towards a labelling station and means (3) for allowing an automatic alignment of the loaders (2) relative to said labelling station. Said means (3) for allowing automatic alignment are originally shaped in such a way as to align each individual loader (2) independently from the remaining loaders present on said support structure. In particular, said means (3) comprise at least a guide (4) whereon are sliding engaged the loaders (2) to be aligned.

FIG. 1



EP 1 288 130 A2

Description

[0001] The present invention relates to a label magazine, in particular for labelling machines, of the type comprising a plurality of loaders positioned side by side on a support structure associated to the magazine, means for moving the loaders towards a labelling stations and means for allowing an automatic alignment of the loaders relative to said stations.

[0002] As is well known, labels are fed to a labelling machine by means of a so-called label magazine, generally provided with a plurality of loaders, each of which contains a pre-set number of labels arranged according to an ordered row.

[0003] According to the prior art, the loaders are fastened to a support plane movable by translation according to three orthogonal axis, for the purpose of feeding the labels with precision to the labelling station of the machine. The loaders are generally positioned side by side and are brought to the operative configuration by the displacement of the support plane, so that the labels can be drawn according to a known technique, not described herein.

[0004] Such loaders are generally fastened to the support plane by means of a plurality of bolts or pins that are inserted in appropriate through holes obtained on the loaders themselves. Alternatively, some loaders are provided, in correspondence with their lower surface, with a plurality of projections so shaped as to be engaged in cavities present on the support plane, such as holes or slots, to maintain in position the loaders themselves, without the need for mechanical connections. In both cases, the loaders are installed on the magazine by an operator.

[0005] The label magazines summarily described above have the drawback of requiring particular precision during the fastening, or laying, of the loaders on the support plane. An error of a few degrees relative to the correct alignment is sufficient to compromise the positioning of the label on a container or even to compromise the drawing of the label by the labelling station of the machine.

[0006] Label magazines are also known in which the loaders are self-aligning relative to the labelling station. In particular, such magazines are provided with a support structure equipped with two conveyor belts whereon the loaders to be fed to the labelling station bear, positioned side-by-side. During the movement of the belts, the first loader in the direction of advance of the belts stops against abutment elements that align it to the labelling station. The next loader, therefore, is able to align itself by impacting on said first loader and in the same way are aligned the remaining loaders present on the magazine. Said magazines, thus, although they do not require any particular attentions by the operator when installing the loaders, can assure the correct operation of the labelling station.

[0007] Said magazine also have an important drawback.

[0008] The correct alignment of each individual loader depends on the correct positioning of the loader that precedes; consequently, any error in position of a loader impacts on all the loaders that follow it.

[0009] The aim of the present invention is to eliminate the aforesaid drawbacks making available a label magazine that is able automatically to align each individual loader, independently of the other loaders present on the magazine. Another aim of the present invention is to propose a label magazine that allows an operator to deposit the loaders on the magazine, without particular precision and with no need to execute any mechanical connection.

[0010] Said aims are fully achieved by the label magazine, in particular for labelling machines, of the present invention, which is characterised by the contents of the claims set out below.

[0011] These and other aims will become more readily available from the detailed description that follows of a preferred embodiment illustrated, purely by way of non limiting example, in the accompanying drawing tables, in which:

- Figure 1 shows a schematic global view of a label magazine according to the present invention;
- Figure 2 shows a bottom section view of the magazine of Figure 1 with some parts removed;
- Figures 3a, 3b, 3c show three schematic front views of a loader of the magazine in three operative configurations;
- Figures 4a, 4b show two schematic front views of a constructive detail of the magazine of Figure 1.

[0012] With reference to the figures, the label magazine is globally indicated with the number 1 and comprises a plurality of loaders 2 in side-by-side position on a support structure of the magazine itself.

[0013] Said magazine 1 is provided with means 3 for allowing an automatic alignment of the loaders 2 relative to a labelling station. In particular the means 3 are originally shaped in such a way as to align each individual loader 2 independently from the remaining loaders present on said support structure. With reference to Figure 2, said means 3 for automatically aligning the loaders 2 comprise at least a guide 4. Said guide is provided with a first portion 4a shaped in such a way as to be inserted, with a certain play, inside a groove 5 present on a lower surface 2a of each loader 2, a second portion 4b so shaped as to be inserted, substantially without play, inside said groove 5, and a third portion 4c joining the first two. The loaders 2 slide along the guide 4 (as shown by the arrows A in Figure 2), from the first portion 4a to the second portion 4b, in correspondence with which, given the coincidence of the dimensions of the groove 5 with those of the guide 4, the loader is locked in a position that is substantially perpendicular to the guide itself. The correct alignment of the loaders 2 rel-

ative to the labelling station is thereby assured.

[0014] The magazine is also provided with means 6 for moving the loaders 2 towards said labelling station.

[0015] With reference to Figures 3a, 3b, 3c, said means 6 comprise at least a pair of driving elements 7, whereof only one is illustrated herein, positioned inferiorly to the loaders 2 at a pre-set mutual distance and able to move with reciprocating translatory motion according to a substantially horizontal direction (arrows B in Figures 3a, 3b, 3c). The driving elements 7 are provided with a plurality of engagement bodies 8 so shaped as to be inserted in cavities 9 present on the lower surface 2a of the individual loaders 2 to make them integral with the driving elements themselves and arrange them according to a predetermined pitch. In the preferred embodiment, said cavities 9 are slots.

[0016] Said engagement bodies 8 comprise a plurality of squares 10 fastened to the driving elements 7, preferably by means of hinges 11, and movable by rotation about said hinges. In particular, in correspondence with an end of each square 10, an abutment body 12 is provided to limit the rotation of the squares; also present is an elastic element, preferably a torsional spring (not shown herein), to bring the squares 10 back to the operative configuration after a rotation thereof. Each square must partially rotate to position itself inferiorly to each loader 2 and, once it arrives in correspondence with the aforesaid cavity 9, it is inserted therein by effect of the return force exerted by the spring. The loaders 2 thereby become integral with the driving elements 7.

[0017] With reference to Figures 4a, 4b, the magazine 1 further comprises means 13 for mutually distancing the loaders 2, readying them to interact with the engagement bodies 8 to facilitate the subsequent arrangement of the loaders according to a predetermined pitch. In the illustrated embodiment, said means 13 comprise at least a separator element 14 able to move with reciprocating motion according to a substantially vertical direction and provided with a plurality of equally spaced projections 14a, so shaped as to position themselves between the loaders 2, distancing them.

[0018] The magazine 1 is also provided with an abutment element (not shown herein) to block the horizontal displacement of the loader 2 upon reaching the alignment of the loader itself with the labelling station. Said abutment element is movable between a first resting configuration, in which it does not interact with the loader 2, and an operative configuration, in which it is active on the loader. In particular, said abutment element contrasts the displacement of the loader acting on the side thereof.

[0019] The operation of the invention is as follows.

[0020] Initially, the separator element 14 reaches the operative configuration by moving upwards to allow an operator to set the loaders 2 down on the magazine support structure, in such a way as to position them at a certain mutual distance to facilitate their subsequent arrangement according to a predetermined pitch.

[0021] During the laying of the loaders 2 on the support structure, the operator inserts, in the first portion 4a of the guide 4, the groove 5 present on the lower surface 2a of each loader. Since the dimensions of the groove 5 are considerably larger than those of the guide, said procedure requires no particular skill and precision on the operator's part and it can be performed rapidly.

[0022] Subsequently, the separator element 14 moves downwards, allowing the driving elements 7 to be activated to bring the squares 10 to engage inferiorly to the loaders 2. During the translation motion of the aforesaid driving means (arrow B of Figures 3a, 3b), the squares 10, impacting against the loaders, rotate about the hinges 11 and, once they arrive in correspondence with the cavity 9, they are inserted therein by effect of the return force exerted by the torsional spring. Thereupon, the driving elements 7, inverting the direction of translation (arrow B in Figure 3c), move the loaders in the direction of the labelling station. The squares 10 remain engaged inside the cavity 9 by effect of the abutment element 12 that prevents them from rotating about the hinge 11. In particular, since the squares 10 are fastened at a predetermined mutual distance on the driving elements, they allow arranging the loaders 2 according to a pre-set pitch.

[0023] During the displacement, the loaders slide along the guide 4 (arrows A in Figure 2) engaging thereto by means of the groove 5 and moving from the portion 4a to the portion 4b thereof. Once they arrive in correspondence with the portion 4b, since its dimensions substantially coincide with those of the groove 5, the loaders are essentially locked in a position that is perpendicular to the guide itself and aligned to the labelling station.

[0024] Once the labels are drawn by the labelling station, the loaders are moved by the driving means 7 towards a collection point, where an operator re-loads them and sets them down again on the magazine support structure.

[0025] The invention achieves important advantages.

[0026] First of all, the presence of the guide 4, allowing each loader 2 to be aligned to the labelling station regardless of the presence of other loaders adjacent thereto, prevents the possibility that any position error of a loader may impact on the remaining loaders.

[0027] Another advantage is represented by the fact that, since the dimensions of the groove 5 of each loader are considerably larger than those of the portion 4a of the guide 4, the laying of the loaders on the support structure of the magazine 1 does not require particular skill and precision on the operator's part and can be performed rapidly, since no type of mechanical connection is necessary between said support structure and the loaders.

Claims

1. Label magazine (1), in particular for labelling machines, of the type comprising:

   a plurality of loaders (2) positioned side by side on a support structure associated to the magazine (1);
   means (6) for moving the loaders (2) towards a labelling station;
   means (3) for allowing an automatic alignment of the loaders (2) relative to said labelling station,

   characterised in that said means (3) for allowing automatic alignment are so shaped as to align each individual loader (2) independently from the remaining loaders present on said support structure.

2. Label magazine as claimed in claim 1, **characterised in that** said means (3) for allowing automatic alignment comprise at least a guide (4) having a first portion (4a) so shaped as to be inserted with play inside a groove (5) present on a lower surface (2a) of each loader (2), at least a second portion (4b) so shaped as to be inserted, substantially without play, in said groove (5) and at least a third portion (4c) joining the first two, each loader (2) sliding along the guide (4) from said first to said second portion (4a; 4b).

3. Label magazine as claimed in claim 1, **characterised in that** said means (6) for moving the loaders comprise:

   at least a pair of driving elements (7) positioned inferiorly to the loaders (2) at a pre-set mutual distance and movable with alternating translatory motion according to a substantially horizontal direction;
   a plurality of engagement bodies (8) positioned at pre-set distance from each other on each driving element (7) and so shaped as to be operatively inserted in cavities (9) defined in the lower surface (2a) of individual loaders (2) to make them integral with the driving elements (7) and arrange them according to a pre-set pitch.

4. Label magazine as claimed in claim 3, **characterised in that** it comprises at least an abutment element to block the horizontal displacement of the loader (2) upon reaching the alignment of the loader (2) with the labelling station, said abutment element being movable between a resting configuration, in which it does not interact with the loader (2), and an operative configuration, in which it is active on the loader (2).

5. Label magazine as claimed in claim 3, **characterised in that** said abutment bodies comprise:

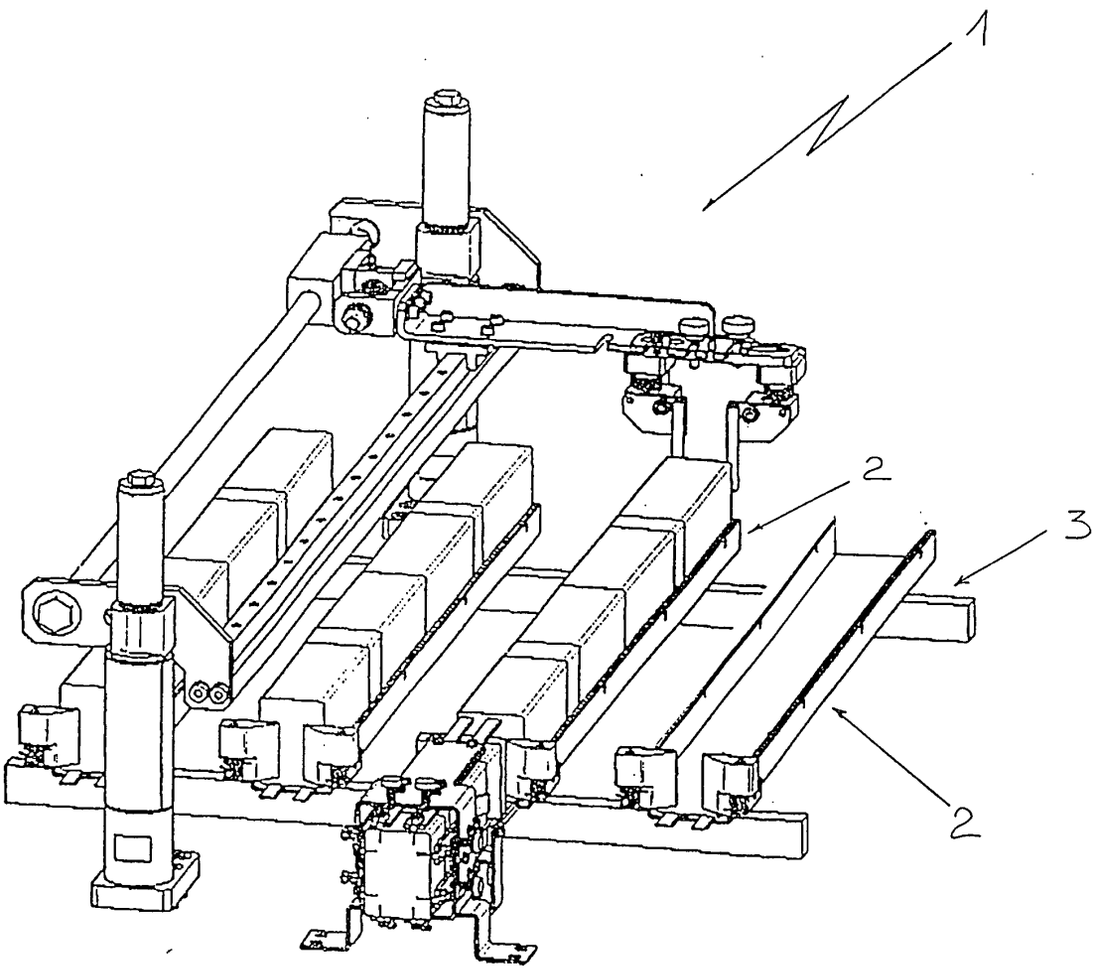
   a plurality of squares (10) hinged on said driving elements (7) and movable by rotation about respective hinges (11);
   a plurality of abutment bodies (12) associated to corresponding squares (10) to limit their rotation about the hinges (11);
   a plurality of elastic elements each of which is associated to a corresponding square (10) to bring it back to the operative configuration after any rotation.

6. Label magazine as claimed in claim 3, **characterised in that** it comprises means (13) for mutually distancing the loaders (2) readying them to interact with said engagement bodies.

7. Label magazine as claimed in claim 6, **characterised in that** said means (13) for distancing the loaders (2) comprise at least a separator element (14) movable with alternating motion according to a substantially vertical direction and provided with a plurality of equally spaced projections (14a) so shaped as to be positioned between the loaders (2), distancing them.

8. Labelling machine, **characterised in that** it comprises a label magazine (1) as claimed in any of the previous claims.

FIG. 1



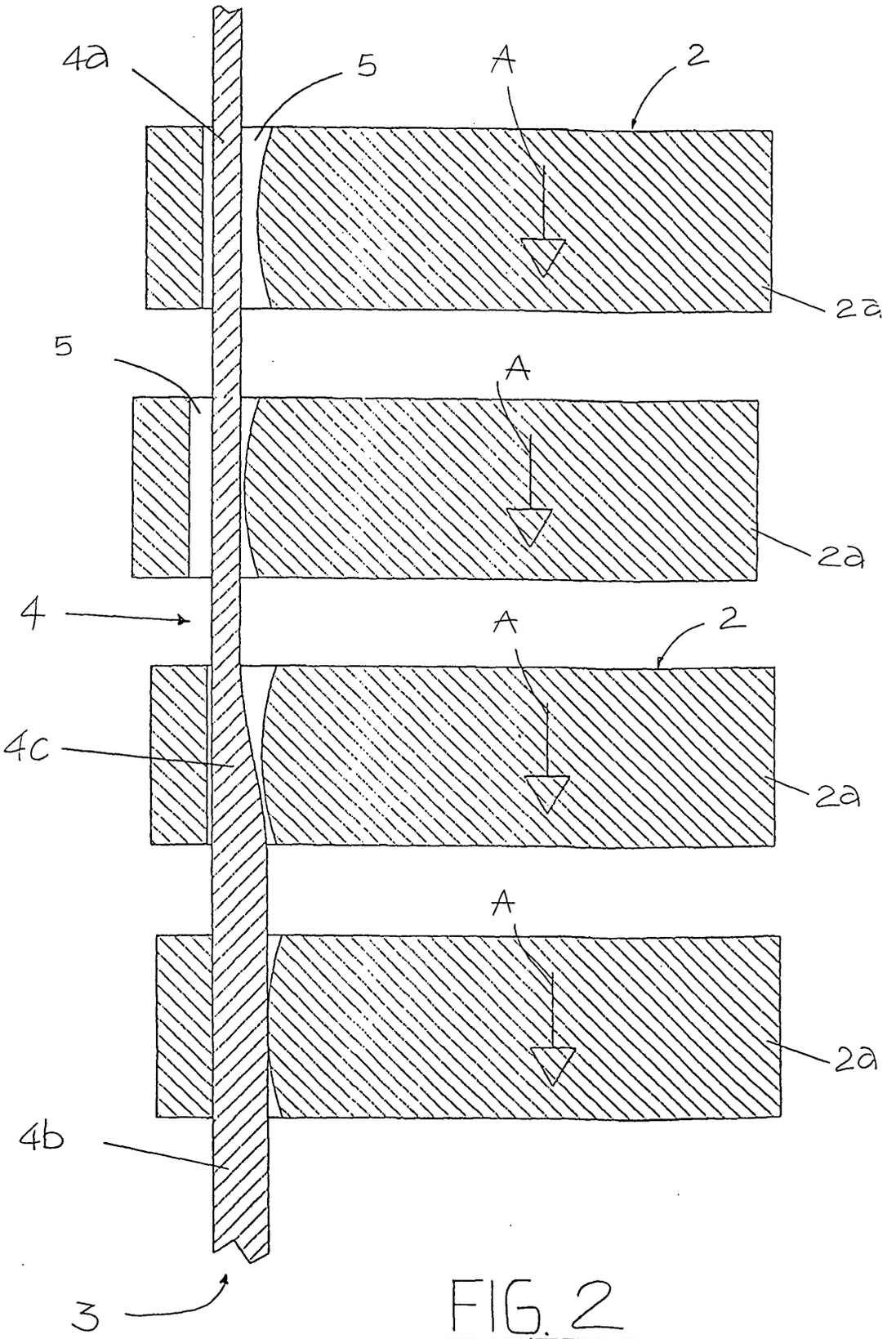


FIG. 2

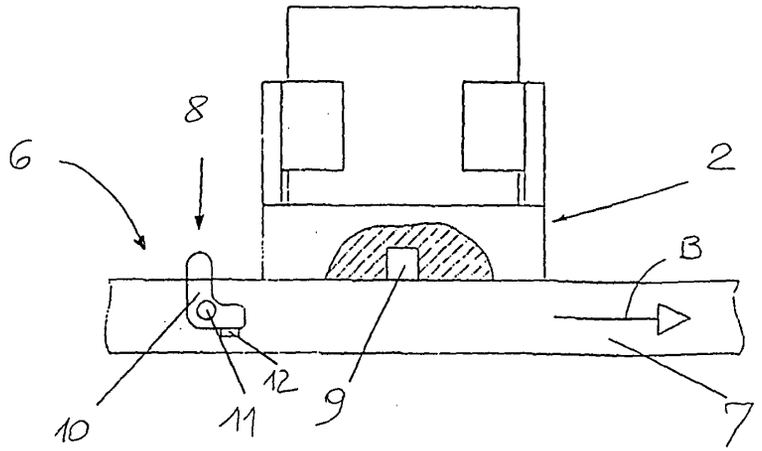


FIG. 3a

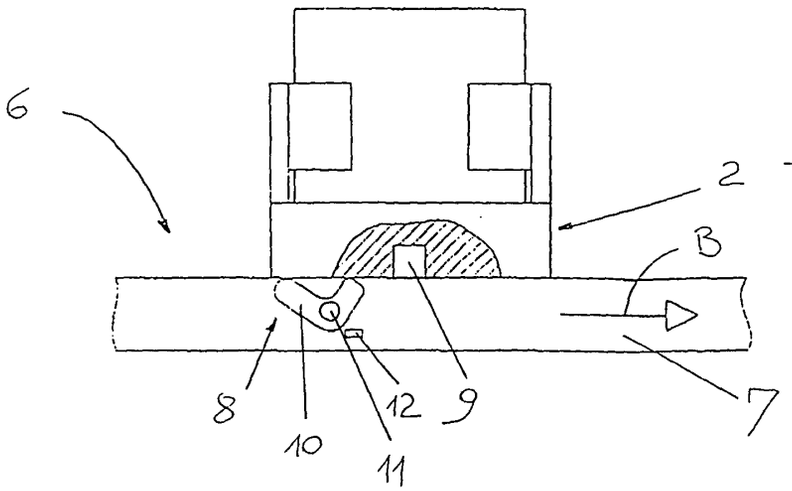


FIG. 3b

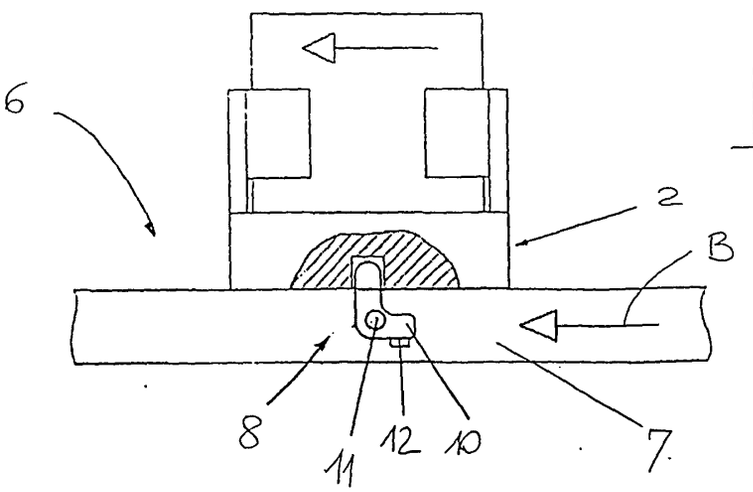
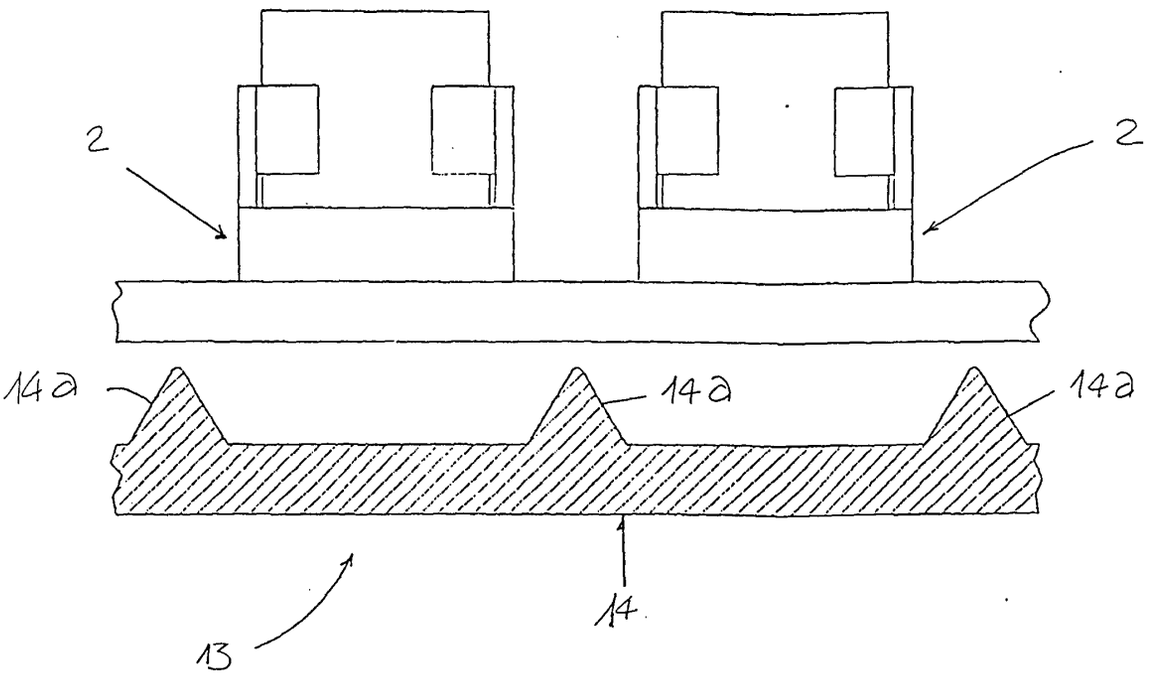


FIG. 3c

FIG.4a



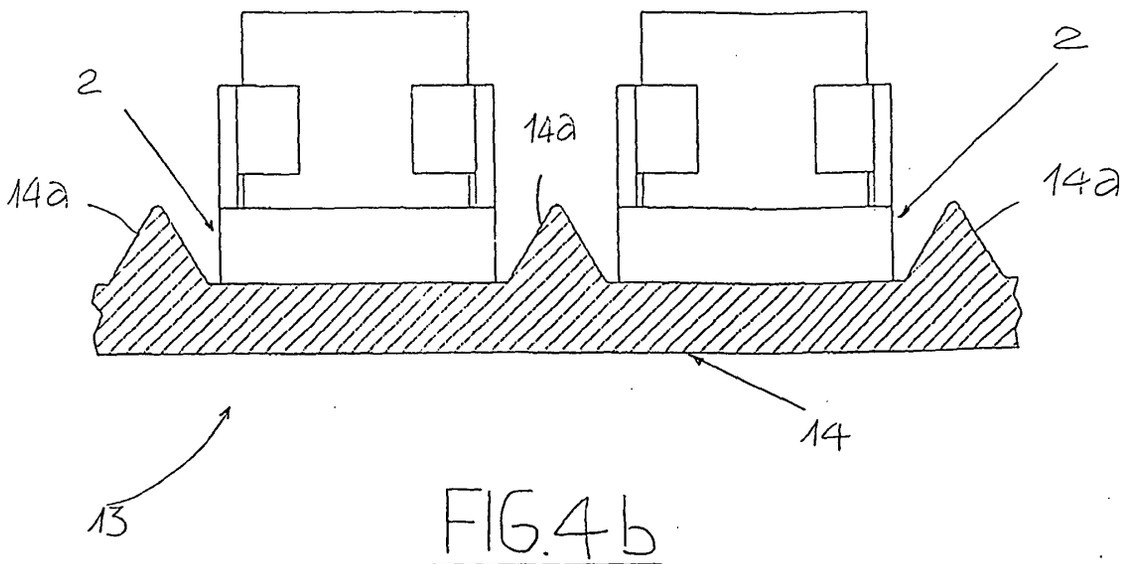


FIG.4b