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(54) Process for the blanking of metallic drawer guides

(57) A process for the blanking of metallic drawer guides, in particular metallic guides for so-called "self-closing" drawers, by a transfer machine, comprising at least one shearing phase from a strip (10) to shape the contours of a preform (12), a phase of separating said preform (12) from said strip (10) to shape a single flat preform (12) in an elongated rectangular form, suitable for producing a whole (13, 14) with two opposed right and left-side guides of a drawer, with additional molding and shaping phases of said flat preform in two parts in the shape of a "Z" facing each other in a specular manner while being centrally joined, and a separating phase by blanking the said two parts so as to shape two guides having an essentially Z-formed cross section (30,40) with an inclined ramp (31,41) in a terminal area (12a).

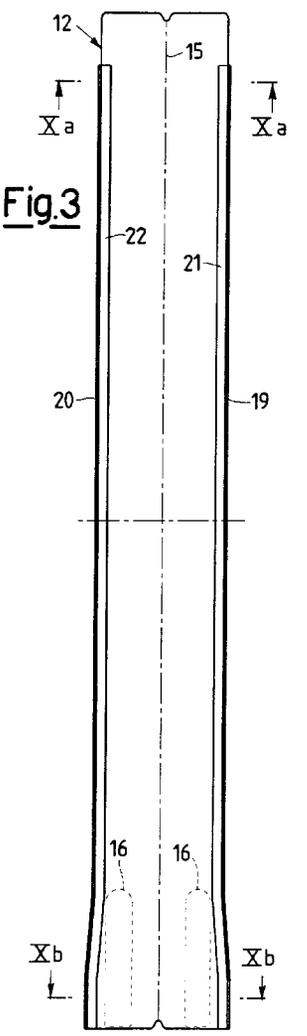

Fig.3

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Description

[0001] This invention refers to a process for the blanking of metallic drawer guides, in particular of metallic guides for so-called "self-closing" drawers capable of ensuring a perfect closing of the drawers.

[0002] During the operations for the serial production of metallic items, in particular of metallic drawer guides, for example when starting from a metal strip, the current preference is to produce a blanking of the strip suitable for producing drawer guides of a so-called "self-closing" type.

[0003] Such drawer guides must always be able to guarantee a perfect closing of the drawer, even against some accidental opening.

[0004] For this purpose, the mobile element of the drawer guides, generally profiled with an essentially "Z"-shaped transversal cross section and with curved lengthwise rims in the terminal portion of the section, presents a downward sloping area near its terminal portion. More exactly, this means an area sloping downward from the base of the ramp-type "Z"-shaped section, which supports a sliding roller firmly attached to the shoulder of the furniture item housing the drawer.

[0005] Thanks to this arrangement of a ramp or upward sloping area (looking at the guide mounted on the drawer) from the base of the "Z" shaped section in the terminal portion of the guide, the roller tends to fall and slide down in the same when the drawer is closed. The drawer is therefore kept in a closed position and remains closed even if subjected to minor or light, even accidental forces which may otherwise tend to open it. It should be carefully noted that this opening could also simply be induced by an unbalanced loading of the drawer in the presence of a less than perfect leveling of the furniture item or the like housing it.

[0006] At this time, in order to produce these guides with an area sloping downward from the base of the "Z" shaped section in its terminal portion, slots are for instance carved out in the flat unfinished material of the preform, so as to allow the subsequent production of the inclined ramp or area by a profiling or bending process.

[0007] Such an operation causes a weakening of the guide's structure in that area, so that the guide may later fail, even if perfectly profiled.

[0008] Any eventual sagging action, even if minimal, prevents achieving a certainty that the guide's inclined area or ramp will always fulfill its function in an ideal manner. The sagging of the material may later also occur as a result of the use of and of the loading stresses in the drawer.

[0009] Such a processing technique based on terminal slots, while quick and inexpensive, generally requires a number of successive finishing operations of the item produced in this manner.

[0010] Moreover and as already mentioned, the item cannot ensure the produced guide's stability in time.

[0011] It must also be noted that the presence of the slot generates an area in which the guide is discontinuous and presents an opening in its lateral wall. Despite its small size, this opening may allow the entering of a foreign body and thereby cause a poor or improper functioning of the sliding roller in the drawer.

[0012] Other processing systems involving drawing processes exhibit similar drawbacks.

[0013] The general purpose of this invention is to eliminate and solve the mentioned technical problems inherent in the known blanking system for metallic drawer guides, in an extremely simple, economical and particularly practical manner.

[0014] Another purpose is to eliminate and utterly minimize any type of sagging of the "self-closing" type of the ramp or area sloping downward from the base of the "Z" section in the terminal portion of the roller guide, while also improving the drawer's overall looks, owing to the fact that there would be no opening to reveal the wood of the drawer itself.

[0015] A further purpose is to achieve a process involving a certain ease of manipulating the item "in transfer", without any significant additional labor or other plant costs for its production.

[0016] In view of the mentioned advantages according to this invention, it was planned to develop a process for the blanking of metallic drawer guides, in particular for the blanking of metallic drawer guides of a so-called "self-closing" type, having the the features described in detail in the attached claims.

[0017] The structural and functional characteristics of this invention and its advantages with respect to the known technology will appear clearer and more evident from a review of the following description, referred to the attached drawings, which show blanking examples produced according to the process of the invention. In the drawings:

- Figures 1 and la show a ground view seen from the top and front side of a first phase of embodiment of the process of the invention in which the separation of a flat preform occurs, so as to jointly produce two opposed guides of a drawer;
- Figures 2 and 2a show a ground view seen from the top and front side of a second phase of embodiment of the invention including the coining of the single preform separated from the first phase,
- Figures 3, 3a, 3b and 3c show a third phase of embodiment of the process according to the invention, in a ground view seen from the top and front side as well as in two longitudinal side views;
- Figures 4, 4a and 4b show a fourth phase of embodiment of the process according to the invention, in a ground view seen from the top and front side as well as in a longitudinal side view;
- Figures 5, 5a, 5b and 5c show a fifth phase of embodiment of the invention, in a ground view seen from the top and front side as well as in two longitudinal side views;

- Figures 6 and 6a show a sixth phase of embodiment of the process of the invention, in which the blanking of the preform into two guides occurs;
- Figures 7 and 7a show a seventh phase of embodiment of the process of the invention, in which, after the blanking, the separation of the two finished guides has already occurred;
- Figure 8 shows an enlarged cross section of the preform of Figure la, showing an intermediate area where the deformation with an increase of material and a broadening of the transversal expansion of the cross section of the preform occurs;
- Figures 9 and 9a show an enlargement of the same cross section of the preform of Figure 8, subjected to a force from above and below, where the terminal deformed and broadened section is shown as a dashed line;
- Figures 10, 10a and 10b show an enlarged section of the preform of Figure 8, subjected to a force from both above and below, where the terminal deformed and broadened portion, and two transversal cross sections of the preform obtained along the lines Xa-Xa and Xb-Xb of Figure 3 are shown as a dashed line;
- Figures 11, 12 and 13 show details of a preform on which some coining elements of three different shapes are acting.

[0018] The Figures 1 and 1a show a first phase of embodiment of the process of blanking the metallic drawer guides according to the invention.

[0019] The purpose is in fact to carry out in a transfer machine, starting from a metallic strip 10, a working process in successive phases so as to produce metallic guides for so-called "self-closing" drawers, as outlined above.

[0020] A first phase covers the preparation and subsequent blanking of the strip 10 by an appropriate punch 11, so as to separate a single flat preform 12, previously molded in an elongated rectangular form, capable of jointly producing the two right and left-hand opposed guides of a drawer.

[0021] The two opposed guides can be described as being two portions 13 and 14, separated by a central longitudinal axis 15 and eventually fitted with a row of variously distributed perforations not shown, both for the final fastening and positioning in the various phases of the subsequent processing in the transfer.

[0022] It is in the second phase of the blanking process in a transfer machine that the coining operation of the two non-separated pieces occurs. The flat preform 12 is in fact, in a terminal portion 12a in a lengthwise direction where an inclined ramp or area is to be produced, subjected to a coining action. More exactly, the preform 12 is, in a selected portion indicated by 16 in Figure 8 of an intermediate area 50 of the section, subjected to the action of coining or similar tools, as will be seen in detail below.

[0023] In the example given in Figure 2, where the flat preform 12 is used to produce two opposed right and left-hand guides, the tools used will be in a number of two, separated from each other, and act on two selected localized portions 16 indicated by a dashed line.

[0024] This action will cause the transversal cross section to centrally expand, by buckling and/or laterally bulging out in the terminal areas 17 and 18, while recovering some material and so to say distributing it in the most uniform possible manner over a broader cross-sectional area. In this manner, though slightly slimmer, the section will maintain its strength and resistance, even in these selected coined portions 16.

[0025] The subsequent processing will straighten out the mentioned buckled areas and undertake the first bending, at 90° with respect to the body of the preform, of the lateral flaps 19 and 20 from the two longitudinal sides of the preform. As can be seen in the Figures 3, 3a, 3b and 3c, in the drawing of the guides, some additional connecting flaps 21 and 22 are provided between the lateral flaps 19 and 20 and the body of the preform, which are only slightly inclined toward the body.

[0026] The bending also occurs at the terminal areasl7 and 18, so that the section of the preform will generally have the shape of Figure 10a and, only in the terminal areas 17 and 18, that of Figure 10b, but in broadened and expanded form.

[0027] In any case, the first bending will form the two longitudinal flaps constituting the sliding seats of the drawer's rollers, not shown. These must have a constant size throughout their length, even at their terminal areas 17 and 18.

[0028] Figures 4, 4a and 4b show a further phase of embodiment of the process of the invention, in which a second bending occurs, in particular in a central longitudinal portion of the preform.

[0029] This generates two additional intermediate longitudinal flaps 23 and 24, which partially contain the additional connecting flaps 21 and 22, slightly inclined with respect to the central body. These flaps 23 and 24 come to hold the selected portions 16 in which the coining operation has occurred.

[0030] The following Figures 5, 5a, 5b and 5c show a subsequent phase of the process of the invention, in which the final bending occurs, in this example only along one flap indicated by 19, of the two lateral flaps 19 and 20 being part of the two longitudinal sides of the preform.

[0031] This produces a small closing rim 25 of one of the sliding seats of the drawer's roller, which is closed and shaped like a U-formed channel.

[0032] It is precisely this last bending that ensures that the two sliding seats of the rollers are kept at a constant width throughout their length.

[0033] The preform is now profiled to its final form and contains the right and left-hand guides.

[0034] The two selected portions 16 where the coining operation has occurred have adavantageously ar-

ranged themselves along the central walls of the central "Z"-shaped section with a slightly lower thickness, and do not involve any defects of strength for the single final guide in its portion shaped as an ramp or inclined area.

[0035] The Figures 6 and 6a, as well as the Figures 7 and 7a, show how the separation of the two finished guides from the individual and overall preform occurs.

[0036] The blanking process according to the invention therefore produces two finished right and left hand guides 30 and 40 from a single preform having terminal ramps or areas 31 and 41, of a constant cross section without sudden reductions of thickness. This further eliminates the structural discontinuities caused by slots or bends of the strip.

[0037] This final structure of the sliding guides 30 and 40 presents an ideal strength, despite being produced from a preform of a metallic strip of an entirely normal thickness.

[0038] This final form is generated by the coining phase that determines an expansion of the transversal cross section, while maintaining the continuity of the section.

[0039] The above description makes it evident that the process of the invention is truly novel and advantageous with respect to that already known.

[0040] Figure 8, referred to the second phase of the transfer machine's operating process according to the invention, generally shows the possible portion of the preform 50 on which the coining operation can be undertaken.

[0041] Figure 9 shows an arrangement in which two coining tools or punches 26 fitted with a flat ending and appropriately separated from each other are acting on the flat preform 12, in one of its terminal areas 12a, as mentioned above.

[0042] A pair of ramps or inclined areas must in fact be created in this area, so as to obtain the two desired guides.

[0043] The two tools are applied above the preform 12, showed by a full line, deforming it in the selected portions 16 along the dashed line shown in Figure 9. This achieves an expansion of the free terminal rims 27 and/or a central buckling 28 due to a double expansion toward the center between the punches 26, determined by the two punches.

[0044] In this figure the thickness of the deformations has been exaggerated for the purposes of a better clarification.

[0045] Figure 9a shows an arrangement in which two coining tools or punches 26, appropriately separated from each other, act on the flat preform 12 from below. The whole occurs in a manner similar to that previously shown in a terminal area 12a of the preform, where a pair of ramps or inclined areas is to be generated in order to obtain the two desired guides. The two tools are applied in a direction from below toward above against the preform 12.

[0046] Figure 10 exemplifies a coining action between two pairs of punches 26 and 26' having a flat terminal area, which act on the two faces of the preform from opposed sides in the selected portions 16. The punches 26 and 26' act both from above and below, deforming or coining the preform which has the section of Figure 10a as shown in Figure 10b. Among other things, the two sections are respectively that of the preform over most of its length and the final one in its terminal area 12a, where the ramps will be applied.

[0047] In this case there is a lateral lengthening of the section in the opposite rims 27, and/or a central buckling 28 in one of the two faces. The coining force will have to be appropriately calibrated.

[0048] Figure 11 shows a simple form of a coining punch 26 and 26', having a flat extremity, as shown in the previous figures.

[0049] It is at any rate also possible to use other forms of coining tools or punches, such as those with a rounded extremity 26" in Figure 12 or with asymmetrically toothed ending 26"' in Figure 13. This will make it possible to direct the propagation of the deformations depending on the specific requirements of the final product, or on the shape of the guide with a terminal ramp or inclined area. These alternative arrangements in the coining phase involve the same advantages outlined before, in this case in addition to the specific shape of the tool or punch.

[0050] This coining operation is followed by a straightening operation of one or more of the buckled and deformed areas, which have been created, before proceeding to the subsequent shaping phases of the preform.

[0051] All these examples are in any case based on the main principle of the process suggested by this invention. This accomplishes the purpose mentioned in the introductory description. Even in this process, of course, the forms of embodiment may differ from those, already numerous, which have been outlined in the drawings merely for exemplifying and non-limiting purposes.

[0052] The construction of the molds and tools to be used can of course be derived from the specific destination in the various phases of the invention, once the purpose of these phases has become clear. The scope of protection of the invention is in any case outlined by the attached claims.

[0053] It has already been stated that the phases may be carried out on a single raw piece in a transfer machine capable of improving and optimizing its quality.

[0054] The phases may be carried out successively or be interrupted by additional operations on the piece.

Claims

1. Process for the blanking of metallic drawer guides, in particular of metallic guides for so-called "self-closing" drawers in a transfer machine, comprising

at least one phase of blanking from a strip (10) to shape the profiles of a preform (12), a phase separating said preform (12) from said strip (10) to produce a single flat preform (12) in an elongated rectangular form, suitable for producing a whole (13, 14) with two opposed right and left-hand guides of a drawer, additional phases of coining and shaping of said flat preform in two "Z"-shaped parts facing each other in a specular manner, joined centrally to each other, and a separating phase based on blanking the two said parts so as to form two guides with an essentially "Z"-shaped cross section (30, 40) having an inclined ramp (31, 41) in a terminal area (12a), characterized in that it comprises:

- A coining phase following the phase of separating said preform from said strip, in which said flap preform (12) is subjected in one of its terminal areas (12a), in a longitudinal direction in which said ramp or inclined area is to be generated (31, 41), to a coining action on one of its intermediate sections (50), thus forming at least one buckled portion (28).

2. A process according to claim 1, characterized in that it achieves a straightening phase of said buckled portion (28) following said coining phase.

3. A process according to claim 1, characterized in that it achieves said coining phase of said one intermediate section (50) of said one terminal area (12) of said preform (12) in a selected portion (16).

4. A process according to claim 1, characterized in that it achieves in said coining phase in said at least one part of one of its sections of said preform (12) of said one terminal area (12a) an expansion of the free terminal rims (27) and a central buckling (28) between two coining tools (26, 26', 26", and 26"') determined by said tools.

5. A process according to claim 3, characterized in that it uses for said coining phase a pair of coining tools (26, 26', 26", and 26"') separated from each other so as to be able to operate on a pair of selected portions (16) of said intermediate area (50).

6. A process according to claim 5, characterized in that it achieves successive bending phases of said preform, so that said selected portions (16) in which said coining operation has occurred arrange themselves along the central walls (23, 24) of a "Z"-shaped section of said final guide.

7. A process according to claim 1, characterized in that it uses for said coining phase a coining tool (26, 26') with a flat extremity.

8. A process according to claim 1, characterized in that it uses for said coining phase a coining tool with a rounded extremity (26").

9. A process according to claim 1, characterized in that it uses for said coining phase a coining tool with an asymmetrical toothed extremity (26"').

10. A process according to claim 1, characterized in that it carries out said coining phase on only one face of said preform.

11. A process according to claim 1, characterized in that it carries out said coining phase on both faces of said preform.

Fig.1a

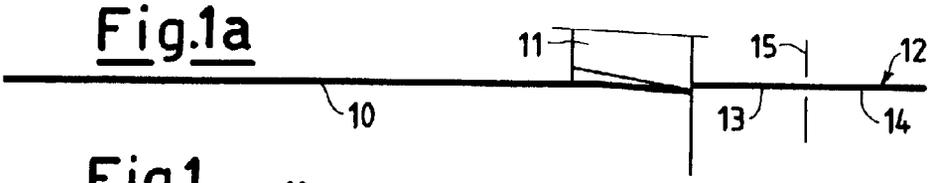
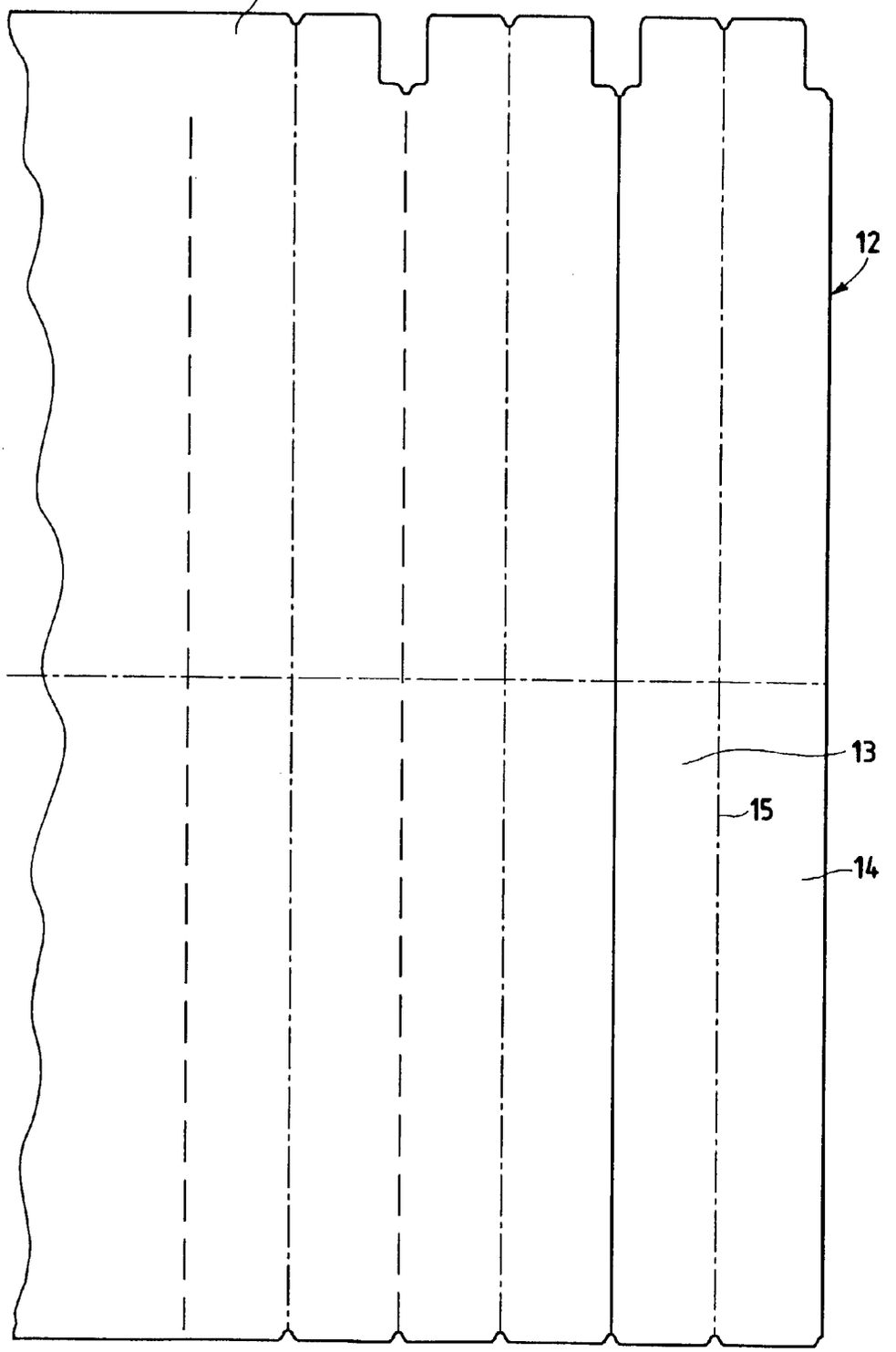


Fig.1



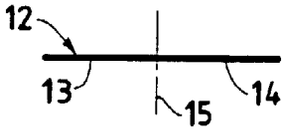


Fig.2a

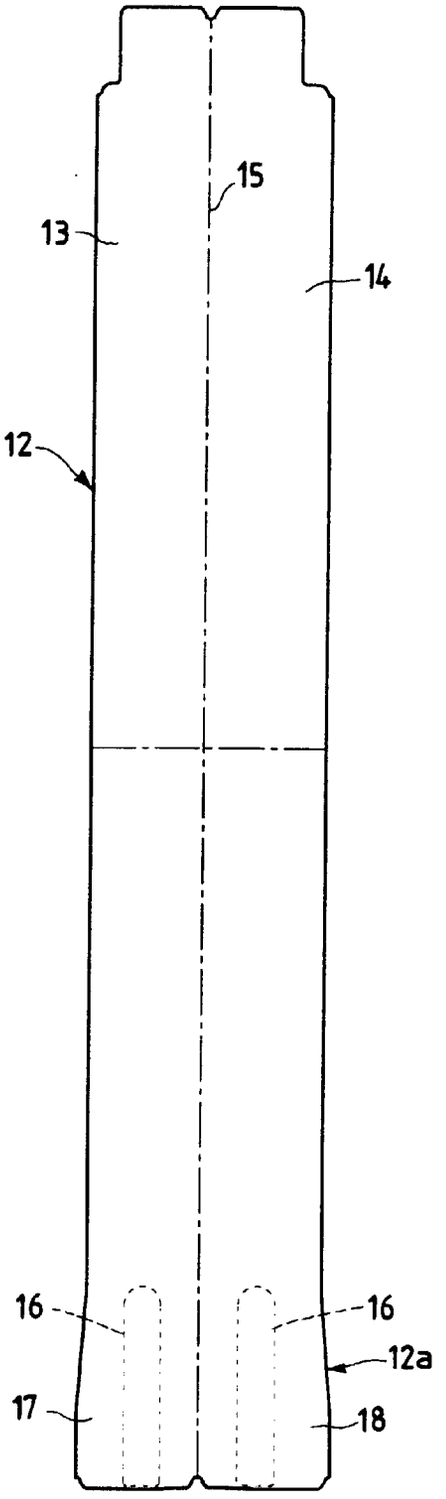


Fig.2

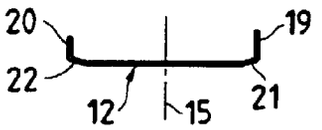


Fig.3a

Fig.3b

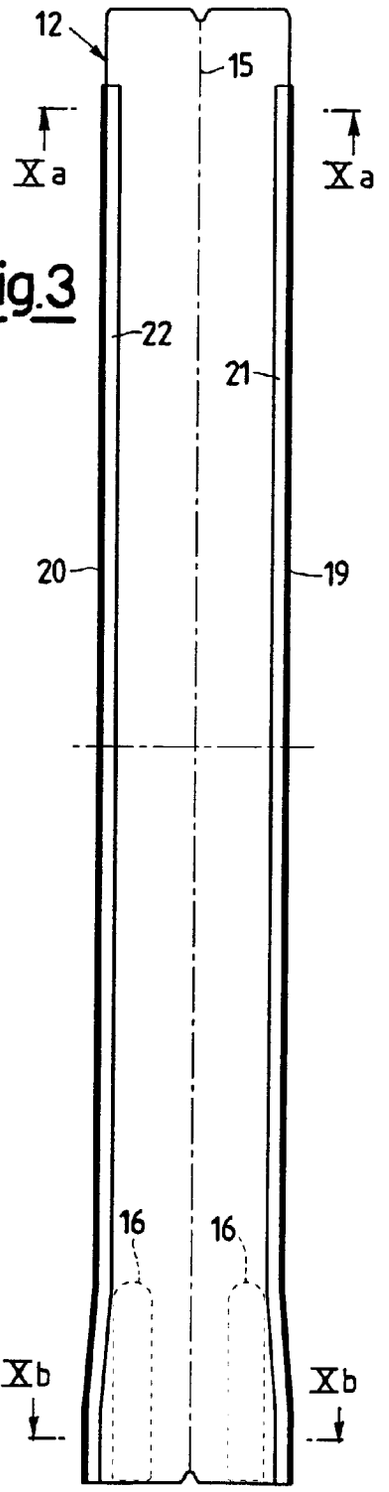
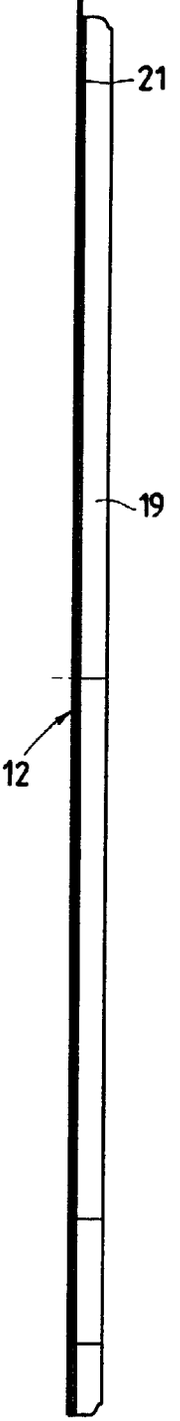


Fig.3

Fig.3c



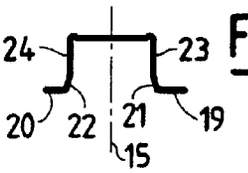


Fig.4a

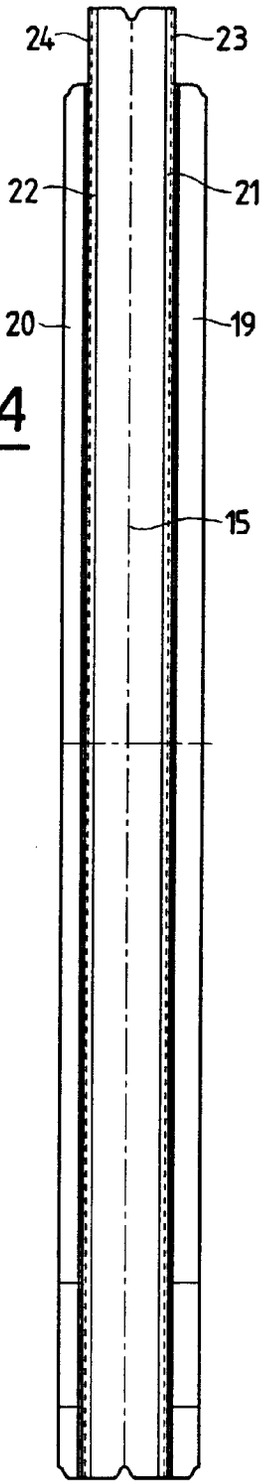


Fig.4

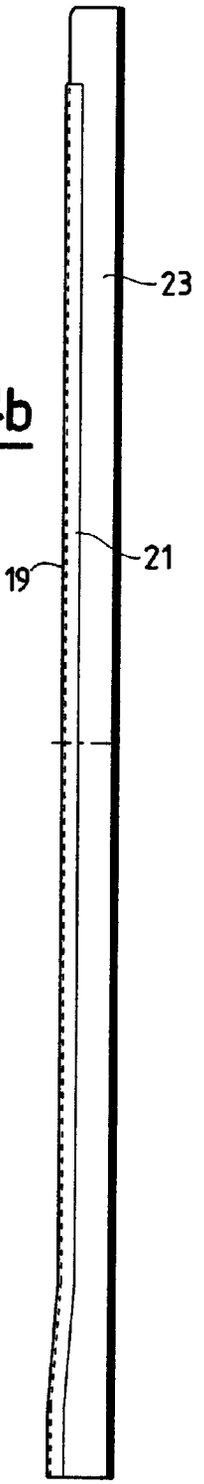


Fig.4b

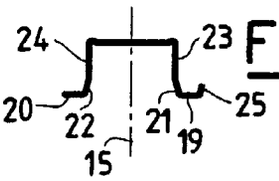


Fig.5a

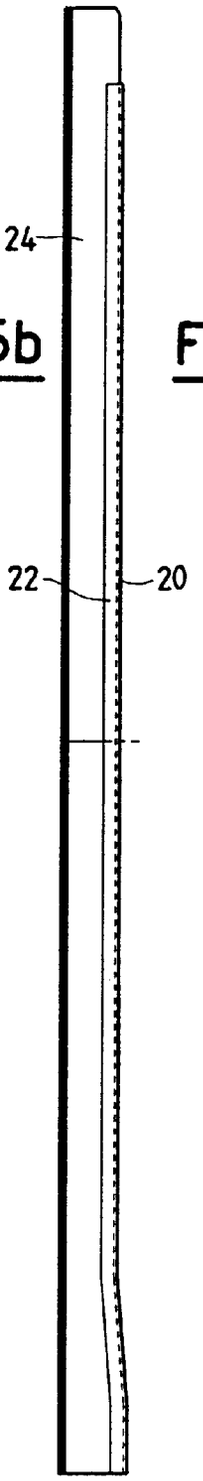


Fig.5b

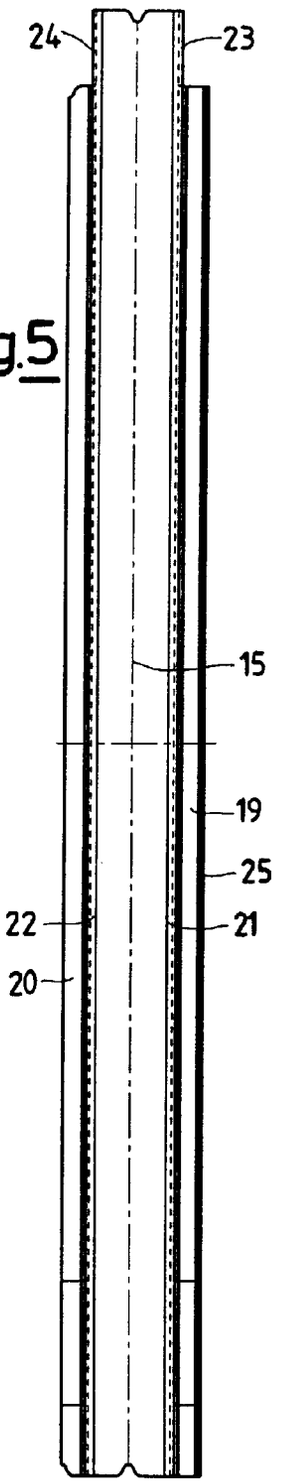


Fig.5

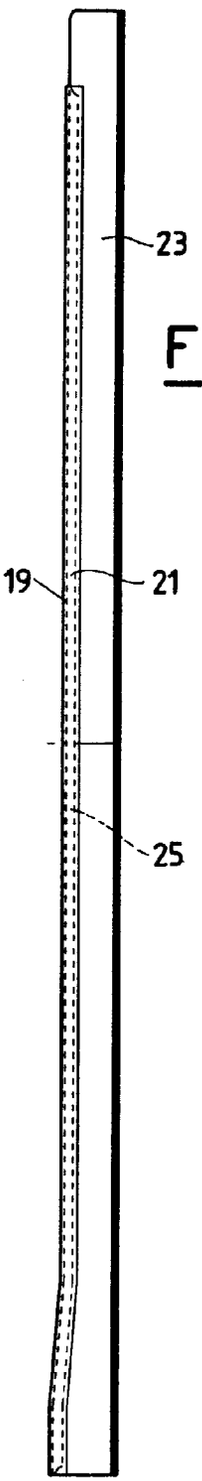


Fig.5c

Fig.6a

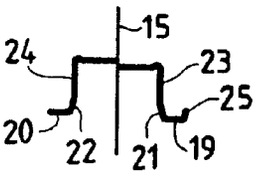


Fig.6

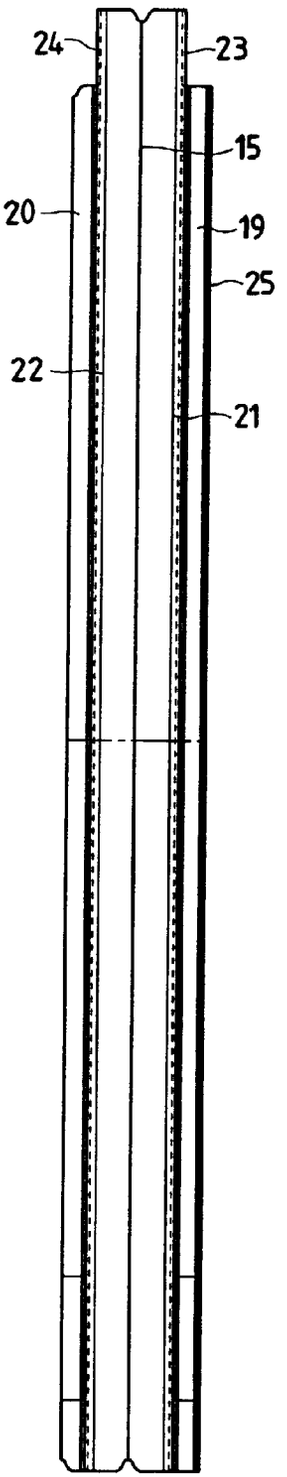


Fig.7a

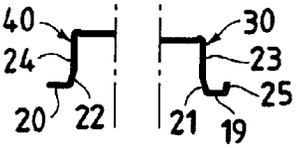


Fig.7

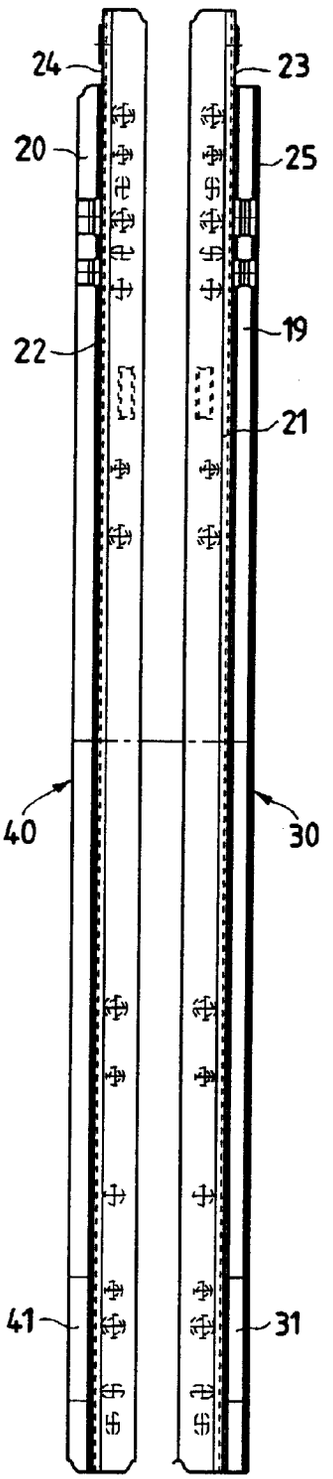


Fig.8

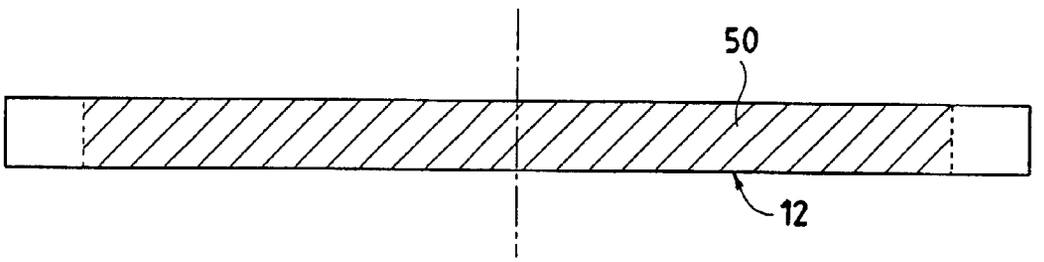


Fig.9

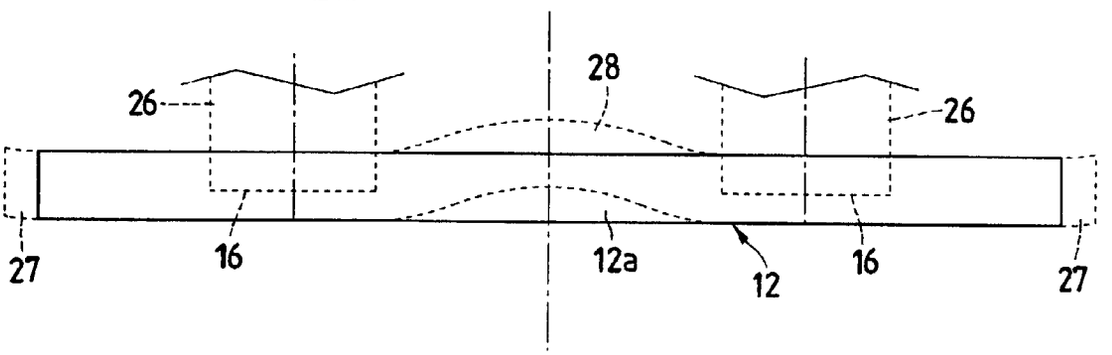


Fig.9a

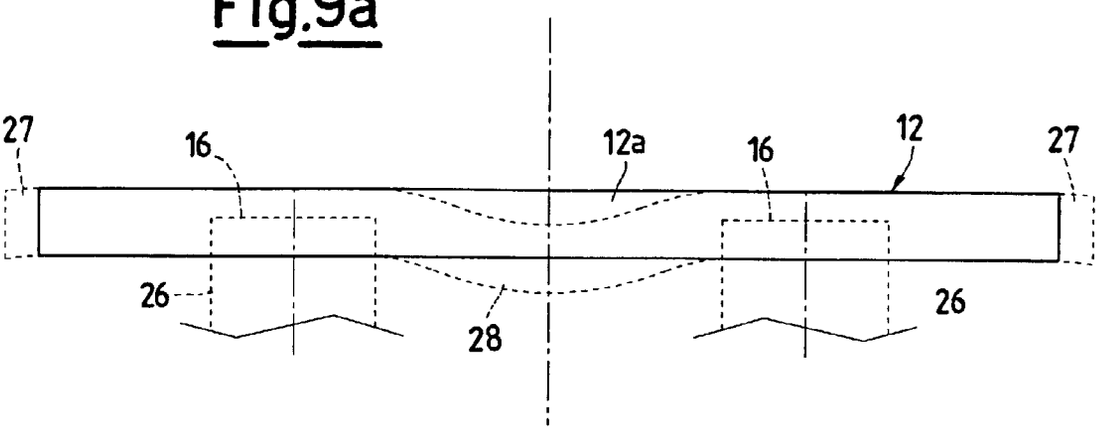


Fig.10

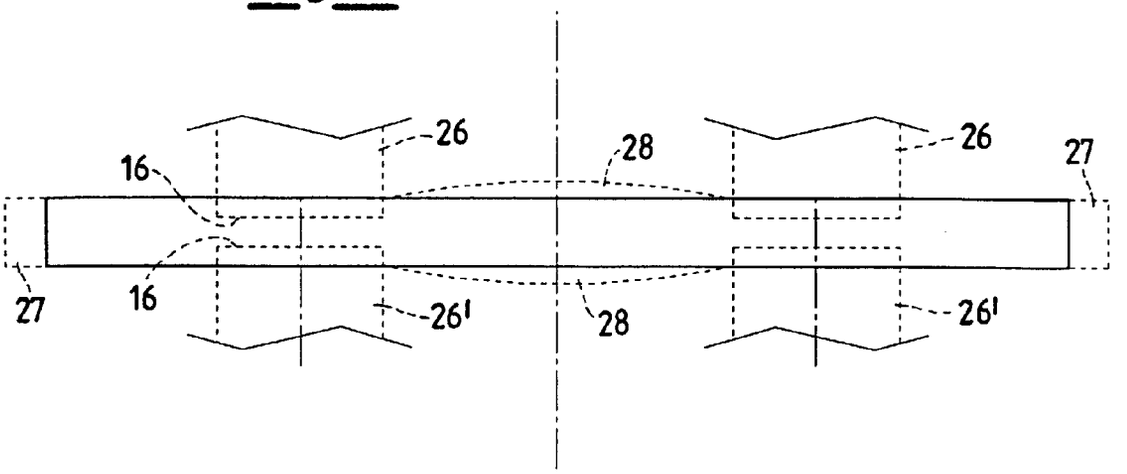


Fig.10a

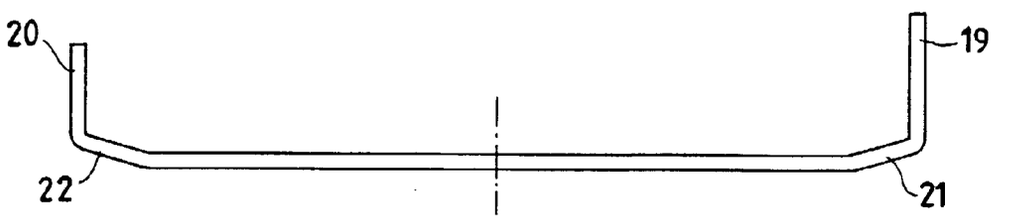
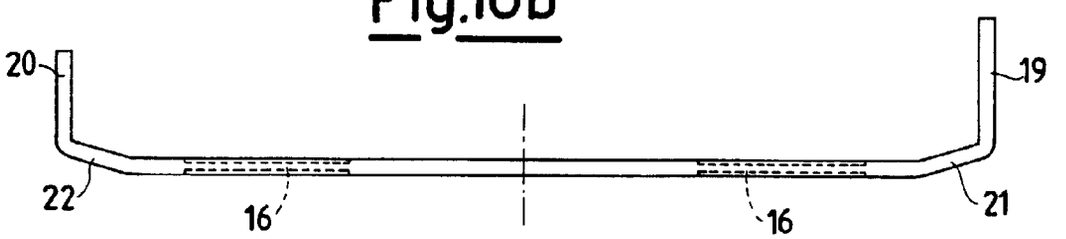


Fig.10b



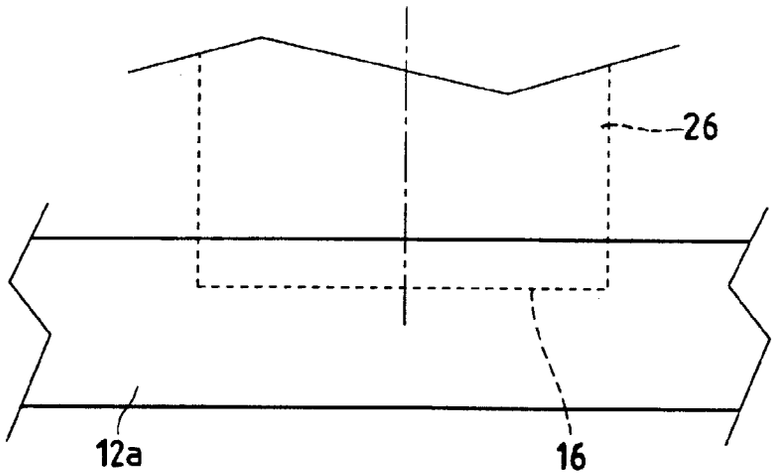


Fig.11

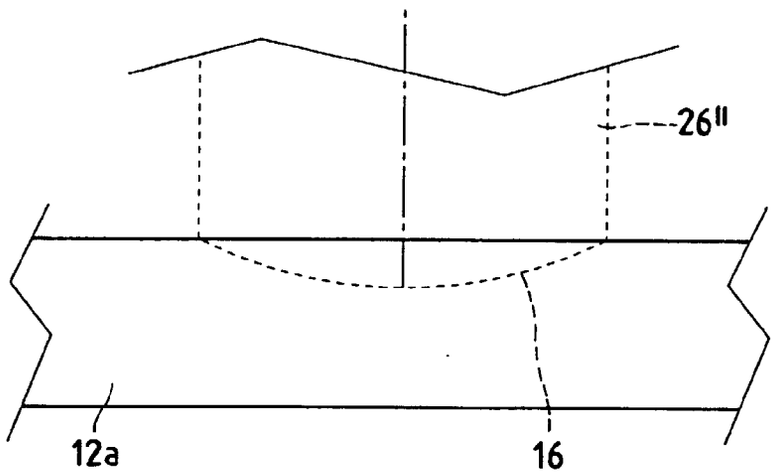


Fig.12

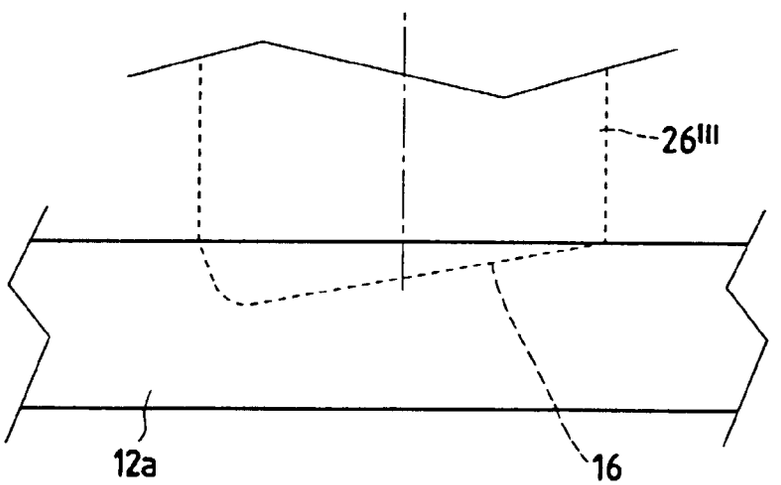


Fig.13