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(54) **Cup member of a foldable furniture hinge provided with two rotary fastening elements**

(57) The invention relates to a cup member of a foldable furniture hinge, provided with two rotary fastening elements. To fasten it, it provides a radially extending retaining wing (1a, 1b) on each side of a longitudinal axis of the hinge, which resides radially on the inner side of a contour of a respective receiving blind hole in a non-installed state of the hinge and on the outer side thereof in an installed state. According to the present invention, the wing (1a, 1b) is positioned under a specific angle with respect to a cup element in order to obtain a smooth

arcuate path of moving of a tip portion of said wing relatively to said stationary cup element, when incorporating, said path thus approaching to the outer surface of said furniture panel i.e. in a direction contrary to the direction of tightening the respective cup member. Said wing (1a, 1b) mates in an abutting manner a supporting face (4) of a cup core. Two supporting faces (4) reside in a common plane that forms an acute angle (α) with the surface plane of the furniture panel, with a tip thereof lying on the side of the cup member averted from the hinge arm (R).

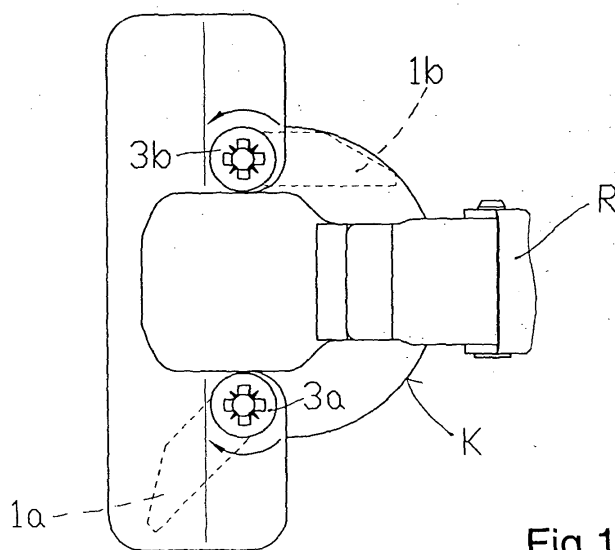
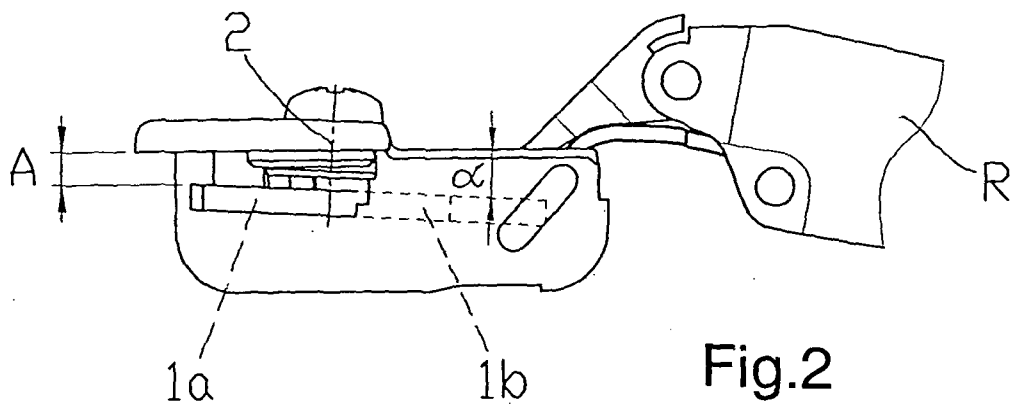


Fig.1



Description

[0001] This patent refers to a cup member of a foldable furniture hinge, provided with two rotary fastening elements, with each of them providing a radially extending retaining wing, which, in a non-installed state of the hinge, resides radially on the inner side of a contour of a respective receiving blind hole and in an installed state it resides on the outer side thereof.

[0002] A cup member of a foldable furniture hinge, provided with two rotary fastening elements, of the kind set forth above is known on one hand ("Prior Art") from the patent US 5,577,297 (*Lautenschläger*) and, on the other ("State of the Art"), from the Slovenian patent application No. P 2002 0 0162 (*LAMA*) and the European patent application No. 03468002.5 (>EP 1 375 801; will be published on 02.01.04) based on the former, whereas the latter two have not been published on the date of filing of the present application.

[0003] In said solutions of the Prior Art and State of the Art, said cup member of a foldable furniture hinge, provided with two rotary fastening elements is fastened into the material body of a furniture panel by means of two spindles of said cup member, each said spindle providing to this end radially extending blade-type wings positioned along a virtual screw line, with said wings, when rotated, protruding into the material of the furniture panel, whereby, due to said virtual screw line-existed attacking angel of said wings, the respective cup member is tightened against a bottom surface of said receiving blind bore.

[0004] In order to successfully retain the cup members constructed according to the aforementioned solutions a sufficiently compact, firm material of a furniture panel must obviously be present.

[0005] Meanwhile, researches in the field of manufacturing furniture panels have been oriented to economize the consumption of wood. It is a practical result of such tendency that glued three-layer compound panels to form furniture panels are produced, whereby said two firm, preferably thin, outer layers are made preferably of plastics, and a comb-type filler made of a paper or paper-like material, whereby the total thickness of said compound panel is preferably smaller than that of wooden filler-type panels and can amount to merely 12 mm.

[0006] Comb structures of the aforementioned type are obviously not strength-characterized materials, which could, after the protrusion of a blade into said materials, together with said blade-type wings of the Prior Art and State of the Art compose a satisfactory retaining relation between a hinge cup member and a furniture panel.

[0007] All that arose a question of research of how to modify said known cup member of a foldable furniture hinge, provided with two rotary fastening elements in order to retain it in a furniture panel made in the form of a glued three-layer compound panel having two firm thin outer layers and a comb-type filler, whereby a manufac-

turing fact has to be considered that a disturbing burr appears on the inner side of the respective cover plate of the panel, when making a blind bore to form a receiving place to install a respective cup member with said bore.

[0008] An incorporation state of a hinge cup member as set forth above is associated with an analogy of a concealed dry bond retaining e.g. electrical parts of installation material, and that is why, as a technological background, the respective solutions have been examined as well. As a rule, said solutions are based on the application of levers.

[0009] In fact, the retaining techniques based on tightening of levers by their acting from the inner side of a cover plate of a panel can be applied with furniture hinges, however, it is practically inadequate; additionally, the fact that said burr is constantly present and not definable in advance represents an insurmountable difficulty for said levers; the expected thickness of said cover plate of said furniture panel is also not defined in advance.

[0010] Thus a retaining technique based on rotary wings as defined in the introductory section of the present description was preserved.

[0011] The primary goal of this invention is to modify a spindle part of a cup member of a foldable furniture hinge, provided with two rotary fastening elements in order to retain said cup member in the incorporated state by means of a wing acting on the inner side of a cover plate of a three-layer panel having a non-firm filler.

[0012] According to this invention, said goal of a cup member as set forth above is achieved by means of two wings, with each of them being positioned at a specific angle with respect to a cup element of said captioned cup member in order to obtain, when incorporating, a smooth arcuate path of moving of a tip portion of said wing relatively to said stationary cup element, said path thus approaching to the outer surface of said furniture panel i.e. in a direction contrary to the direction of tightening the respective cup member.

[0013] The tightening effect according to the invention is thus contrary to that embodied by the wings of Prior Art and State of the Art wherein, when incorporating, a tip portion of a wing is smoothly shifted in the direction of putting in and tightening of the respective cup member.

[0014] Besides, said wing according to this invention mates, in an abutting manner, a supporting face of a cup core or a respective section of said cup element serving as a cup core, whereby said cup core being a separate constructional component can be made of plastics or a metal and embodied as a monolithic or a two-part constructional component.

[0015] A difference to Prior Art and State of the Art lies is that said wing according to this invention does not act with the material body of the furniture panel.

[0016] Accordingly, two supporting faces of the cup core made of plastics, with which the two wings act, are in question, whereby said faces reside in a common

plane forming together with the surface plane of the furniture panel an acute angle with a tip thereof lying on the side of the cup member averted from the hinge arm.

[0017] Thereby a retaining quality of the cup member is achieved that is in ideal proportion to a momentum of pulling out the cup member, generated by the hinge arm.

[0018] Hereinafter, the feasibility of the proposed invention is proved on the basis of an embodiment of a preferred cup member, the description of which is based on the enclosed drawings where

FIG. 1 is a plan of an inventive rotary fastening element-type cup member of a foldable furniture hinge,

FIG. 2 is an elevation of the hinge cup member of FIG. 1,

FIG. 3 is an overhead projection of a monolithic cup core of the cup member of FIGS. 1, 2,

FIG. 4 is a section along the line IV-IV of FIG. 3,

FIG. 5 is a plan to FIG. 3, and

FIG. 6 shows an analogous projection, a section, and a plan as in FIGS. 3 to 5, yet regarding a two-piece cup core.

[0019] In FIG. 1, two retaining wings 1a, 1b, more specifically the wing 1a in a retaining position and the wing 1b at stand-by position are drawn in dotted lines. The figure shows a blade-type construction of the wings 1a, 1b with practical importance of said blade-type shape being in that the wing also functions as a unilaterally fastened girder of a substantially constant bending strength, from which it is expected to achieve an elastic adaptation of the girder to the given dimensions available for the installation, by means of the respective elastic flexibility.

[0020] It is clearly evident from FIG. 2 that with respect to a surface of a furniture panel (not shown) having a thickness A the wings 1a, 1b are positioned in an inclined way. In a preferred embodiment of a cup member as shown, two supporting faces of a cup core (details: hereinafter), the wings 1a, 1b act with, reside in a common plane, which forms an angle α (alpha) with the surface of the furniture panel, with said angle having its tip residing on the side of the cup member averted from a hinge arm R.

[0021] It is understandable that according to the inclined arrangement of the wings 1a, 1b, a rotary axis 2 of each rotary element 3a, 3b, said rotary element being preferably a rivet in this embodiment, is arranged normally to the wings 1a, 1b, i.e. also in an inclined way, with the wing 1a, 1b being connected to said rivet in a manner that there exists no relative rotation between them. In the shown embodiment, the rivets 3a, 3b comprise screw driver heads, which does not mean that other embodiments, such as those providing levers of the prior art instead of the heads 3a, 3b, are excluded.

[0022] In the stand-by position of the hinge, the wing 1a, 1b resides on the inner side of a circular contour K

of a cup element of the respective cup member (the position of the wing 1b in FIG. 1). By rotating the rivet 3a, 3b, each of them in a specific direction, the free tip portion of the wing 1a, 1b smoothly approaches to the inner side of a cover layer of said furniture panel and, after having reached it (the wing 1a in FIG. 1), it begins to get elastically deformed if further rotated.

[0023] In a built-in state, the position of the hinge is determined by nesting the cup element of the cup member in an appropriate recess (hole, receiver) made in the furniture panel, and the cup member is then fastened therein on the basis of two elastically deformed wings 1a, 1b that, from the inner side, thrust the cover layer of the three-layer panel and thus tighten the respective cup member to said panel.

[0024] When discussing the supporting plane of the core, as evident from FIGS. 3 to 5 for a monolithic core made of plastics and in analogy from FIG. 6 for a two-piece core made of plastics, they both belong to the respective cup member, in each case a face 4 is in question, the wings 1a, 1b act with, the faces 4 residing in a common plane forming an angle α with the surface of the furniture panel.

Claims

1. Cup member of a foldable furniture hinge, provided with two rotary fastening elements, with each of them providing a radially extending retaining wing (1a, 1b), which, in a non-installed state of the hinge, resides radially on the inner side of a contour of a respective receiving blind hole and in an installed state it resides on the outer side thereof, **characterized in that** the wing (1a, 1b) is positioned under a specific angle with respect to a cup element having a contour (K) in order to obtain, when incorporating, a smooth arcuate path of moving of a tip portion of said wing relatively to said stationary cup element, said path thus approaching to the outer surface of said furniture panel i.e. in a direction contrary to the direction of tightening the respective cup member.
2. Cup member of claim 1, **characterized in that** said wing (1a, 1b) mates, in an abutting manner, a supporting face of a cup core or a respective section of said cup element serving as a cup core, whereby said cup core being a separate constructional component can be made of plastics or a metal and embodied as a monolithic or a two-part constructional component.
3. Cup member of claim 2, **characterized in that** two supporting faces (4) of the cup core made of plastics, with which the two wings (1a, 1b) act, reside in a common plane forming together with the surface plane of the furniture panel an acute angle (α) with

a tip thereof lying on the side of the cup member
averted from the hinge arm (R).

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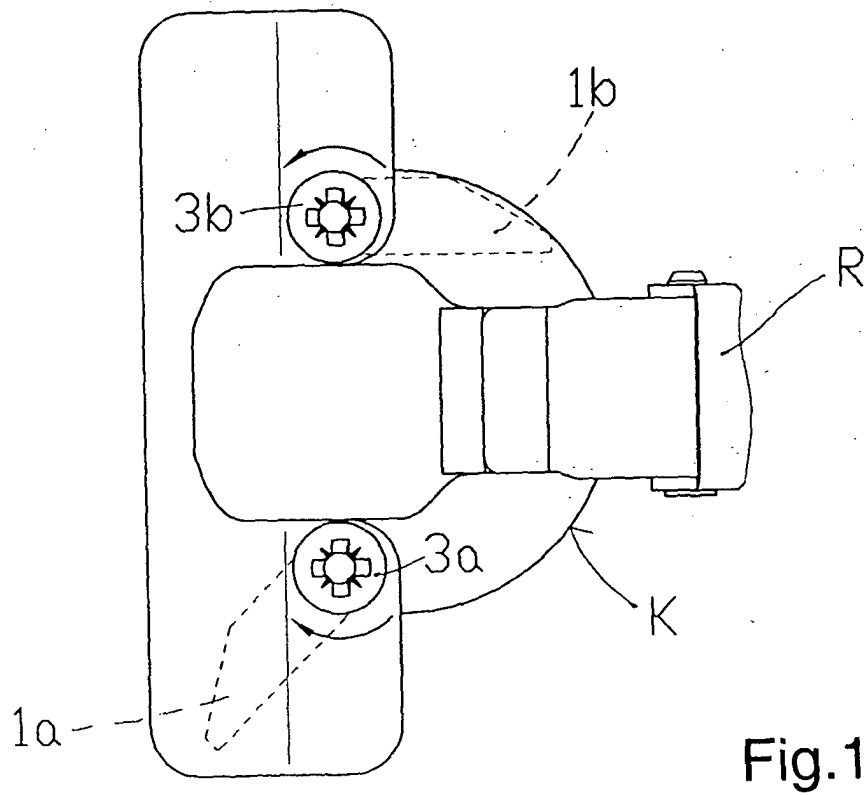
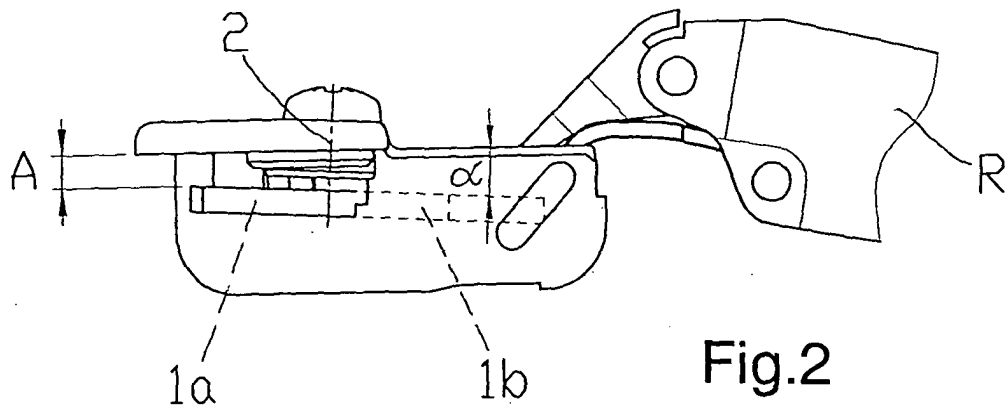
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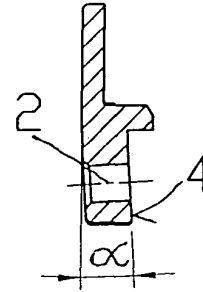
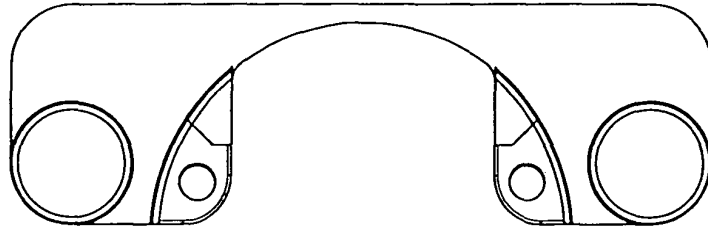
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IV →



IV → Fig. 3

Fig. 4

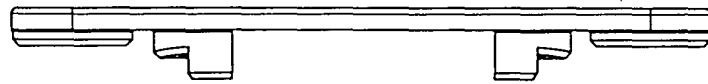


Fig. 5

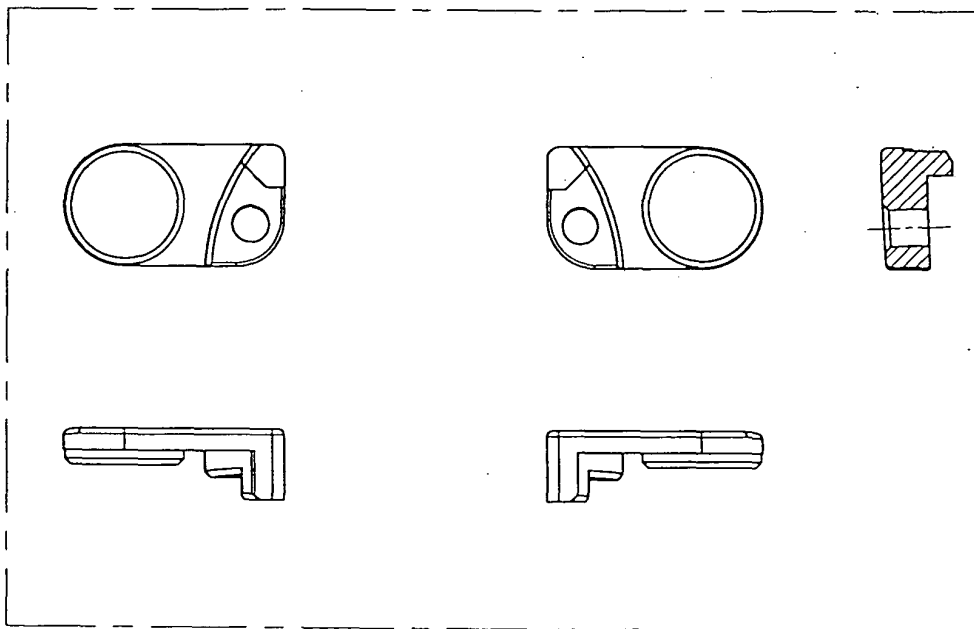


Fig. 6