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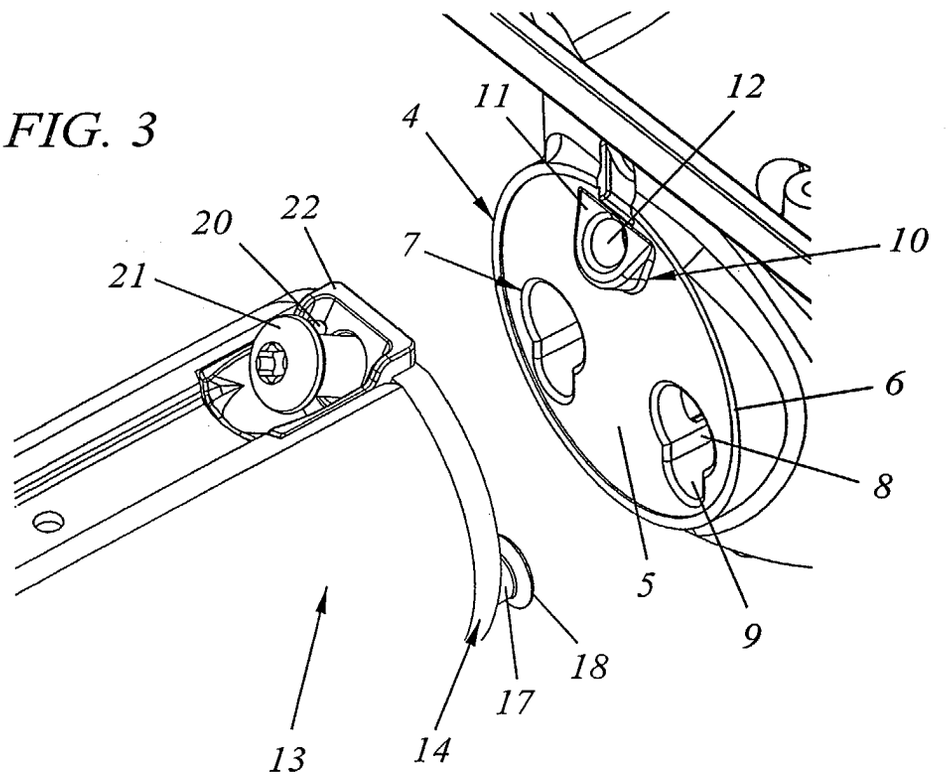
(54) Coupling member for interconnecting parts of a frame

(57) The invention relates to a coupling member for mutually coupling parts of a frame in which said member comprises at least two elements mounted on the respective parts to be coupled, said elements comprise complementary engaging surfaces and positioning elements for being able to position said complementary engaging surfaces in relation to one another are provided as well as clamping means for being able to clamp said engaging surfaces against one another.

FIG. 3



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Description

[0001] The present invention relates to a coupling member for interconnecting parts of a frame in which the parts to be connected will be at an angle to one another.

[0002] Such coupling members are known per se. The object of the invention is to provide for a coupling member by which on one hand, it is possible to establish a coupling very quickly and with the smallest possible amount of parts, while on the other hand, an exact positioning of the parts in relation to one another and the load-bearing capacity should be guaranteed at all times. The coupling is intended particularly for usage in movable and semi-movable structures which are not too heavy, in which the appearance of the structure also plays an important role. One can think of furniture for office and shop furnishing, and related structures.

[0003] Accordingly, the invention provides for that the member comprises at least two elements that have been mounted on the parts to be coupled, in which said elements comprise complementary engaging surfaces and in which clamping means for clamping the engaging surfaces together are provided. Said complementary engaging surfaces are formed in such a way, e.g. an assembly of profiled and plane parts, that they can only abut fittingly in one way.

[0004] According to a further elaboration, positioning elements for positioning the complementary engaging surfaces in relation to one another are provided. Thereby, the engaging surfaces can be moved into the appropriate position in relation to one another before clampingly contacting them.

[0005] Preferably, it is provided for, that the positioning elements comprise at least one set of complementary elements mounted on the respectieve engaging surfaces. According to another elaboration, a set of complementary positioning elements substantially comprises at least one cam and an aperture for receiving the cam.

[0006] According to a preferred embodiment it is provided for that the cam and the aperture for the cam have such a shape that the cam can be stuck into the opening from a first position and that from there, by movement in a second direction, a second, final position is reached.

[0007] By providing for that the cam has its largest diameter at the free outer end and the aperture for receiving the cam is of an elongate shape having a diameter tapering in longitudinal direction, it is achieved that on moving the cam from the first to the second position, it can not be taken from the aperture in a direction opposite to the first direction anymore. Therefore, immediately after inserting the cam or cams into the aperture or apertures, a coupling between the parts concerned is established, from which the exact appropriate position can be reached with ease. In this way, the positioning means form a guide to the appropriate position without the risk that the parts may easily disengage from one another.

[0008] Further, it can be provided for, that the cam and the aperture for the cam have such a shape, that on reaching the second, final position, the engaging surfaces have been moved towards one another or abut one another at least partly. This can be achieved e.g. by having the thickness of the material in which the aperture for the cam is provided increase in the direction of the second, final position, the larger diameter of the cam at the outer end having been realized with a plate-shaped element, for example.

[0009] The clamping means by which the engaging surfaces can be clamped to each other are preferably mounted in profiled portions of the respective engaging surfaces, in which the profiled portions are at an angle to the general plane or the plane parts of the engaging surfaces, in such a way that on clamping the engaging surfaces together, the complementary positioning elements are forced into the second, final position. Therefore, the clamping means are mounted in such a way, that the clamping force has a component perpendicular to the engaging surfaces as well as a component in the direction of the first to the second position of the cam in the aperture for the cam. Apart from clamping together the respective engaging surfaces of the parts in the appropriate position, said clamping means also serve as additional positioning member providing for that the second position of a cam in an aperture for the cam is actually reached.

[0010] Preferably, the clamping means and the positioning means have been mounted on the engaging surfaces in spaced-apart relationship, so that there is sufficient freedom of movement for being able to insert the cam or cams into the respective apertures first, before having the clamping means engage one another. Then, preferably, the positioning and clamping means have been mounted in such a way, that the clamping means can be reached easily from a normal working position.

[0011] Hereinafter, the coupling member according to the invention is further explained by way of the example given in the drawing, in which

- fig. 1 shows a perspective view of a leg for a desk top with a first engaging surface of a coupling member mounted on it;
- fig. 2 shows a perspective view of a portion of a horizontal top member with a second engaging surface to be coupled to said leg; and
- fig. 3 shows a perspective view of said horizontal top member and said leg before these are coupled to one another.

[0012] Fig. 1 illustrates a leg 1 for a desk top, having a vertical post 2 and a horizontal carrier 3 on which the desk top can be secured. At the bottom side, the vertical post 1 is provided with a base not further illustrated in the drawing. Such a leg 1 is connected to at least one further leg with the help of a horizontal top member 13

(see fig. 2) in order to obtain a supporting entity.

[0013] At the crossing between post 2 and carrier 3, a first engaging surface 4 being part of said coupling member is provided. Here, the engaging surface 4 is a substantially cylindrical surface 5 having a raised edge 6. The plane mounts apertures 7 being part of positioining means 7, 8, 9, 16, 17, 18. The apertures 7 have a portion 8 of a first diameter and a further portion 9 of a second diameter, which is smaller than the first diameter.

[0014] At the top in engaging surface 4, a profiled part 10 protruding from the plane 5 is provided. The profiled part 10 has a first sloping clamping plane 11 in which a threaded hole 12 has been made, which is part of the clamping means.

[0015] Fig. 2 illustrates a top member 13 having its end provided with a second engaging surface 14 complementary to first engaging surface 4 on leg 1. The engaging surface substantially comprises a circular plane 15 intended to fall inwardly of the raised edge 6 of the first engaging surface 4.

[0016] The plane 15 mounts two cams 16 comprising a cylindrical part 16 being perpendicular to the plane 15 and a circular plate part 18, mounted at its outer end, and having a larger diameter than the cylindrical part 17. At the top of plane 15, a cavity 19 is provided, which is bounded by a sloping second clamping surface 20 intended for cooperation with first clamping surface 11 on first engaging surface 4.

[0017] A threaded bolt 21 is mounted perpendicular to the second clamping surface 20. The threaded bolt 21 is accomo-dated in an insert 22 which can be slid across and/or into the clamping surface and can engage it with a snap connection. This facility provides for that the threaded bolt 21 should be mounted at the time when the coupling between the respective parts is established. Therefore, during storage and transport, no measures need be taken for protecting the otherwise projecting portion.

[0018] In fig. 3, the parts to be coupled, leg 1 and top member 13, respectively, are illustrated in a position in which the cams 16 can be brought into the apertures 7. The circular plate parts 18 are inserted in the parts 8 having the largest diameter, whereupon the top member 13 can be moved downwards and the cylindrical parts 17 can be lowered into portions 9 of the apertures 7 of smaller diameter. Subsequently, the threaded bolt 21 is brought into the threaded hole 12 and tightened as a result of which, at the same time, the respective engaging surfaces 5, 15 can come to lie against one another and the cams 16 are forced to the lowermost position.

[0019] A series of tests has clearly shown, that, although the structure is relatively simple, the coupling which can be established by it does not show any play and can therefore be loaded to a high degree.

Claims

1. Coupling member for interconnecting parts of a frame in which the parts to be coupled will be at an angle to one another, **characterized in that** the member comprises at least two elements that have been mounted on the respective parts to be coupled, in which said elements comprise complementary engaging surfaces and in which clamping means for clamping the engaging surfaces together are provided.

2. Coupling member according to claim 1, **characterized in that** the respective engaging surfaces are provided with a plane portion and a profiled portion.

3. Coupling member according to claims 1-2, **characterized in that** positioning elements for positioning the complementary engaging surfaces in relation to one another.

4. Coupling member according to claim 3, **characterized in that** the positioning elements comprise at least one set of complementary elements which have been mounted on the respective engaging surfaces.

5. Coupling member according to claim 4, **characterized in that** a set of complementary elements comprise substantially a cam and an aperture for receiving said cam.

6. Coupling member according to claim 5, **characterized in that** the cam and the aperture for the cam are of such a shape that the cam can be stuck into the opening from a first position and that from there, by movement in a second direction, a second, final position is reached.

7. Coupling member according to claim 6, **characterized in that** the cam and the aperture for the cam have such a shape, that on reaching the second, final position, the engaging surfaces will abut one another at least partly.

8. Coupling member according to claim 7, **characterized in that** the cam has its largest diameter at the free outer end and the aperture for receiving the cam is of an elongate shape having a diameter tapering in longitudinal direction

9. Coupling member according to claims 1-8, **characterized in that** the clamping means comprise a threaded hole mounted in the first engaging surface and a threaded bolt engaging the second engaging surface.

10. Coupling member according to claim 9, **character-**

ized in that the threaded hole and the threaded bolt have been mounted in profiled portions of the respective engaging surfaces.

11. Coupling member according to claim 10, characterized in that the profiled portions are at an angle to the general plane and/or the plane parts of the engaging surfaces, in such a way that on clamping the engaging surfaces together, the complementary positioning elements are forced into the second, final position.

12. Coupling member according to claims 9-11, characterized in that the profiled portions are substantially formed by a set of clamping surfaces situated offset from the plane of the engaging surfaces.

13. Coupling member according to claim 12, **characterized in that** the clamping surfaces and complementary positioning means on each of the engaging surfaces take up approximately opposite positions.

14. Coupling member according to claims 9-13, characterized in that an insert having means for receiving the threaded bolt has been provided, in which said insert can be slid onto the clamping surface or can engage it by a snap connection.

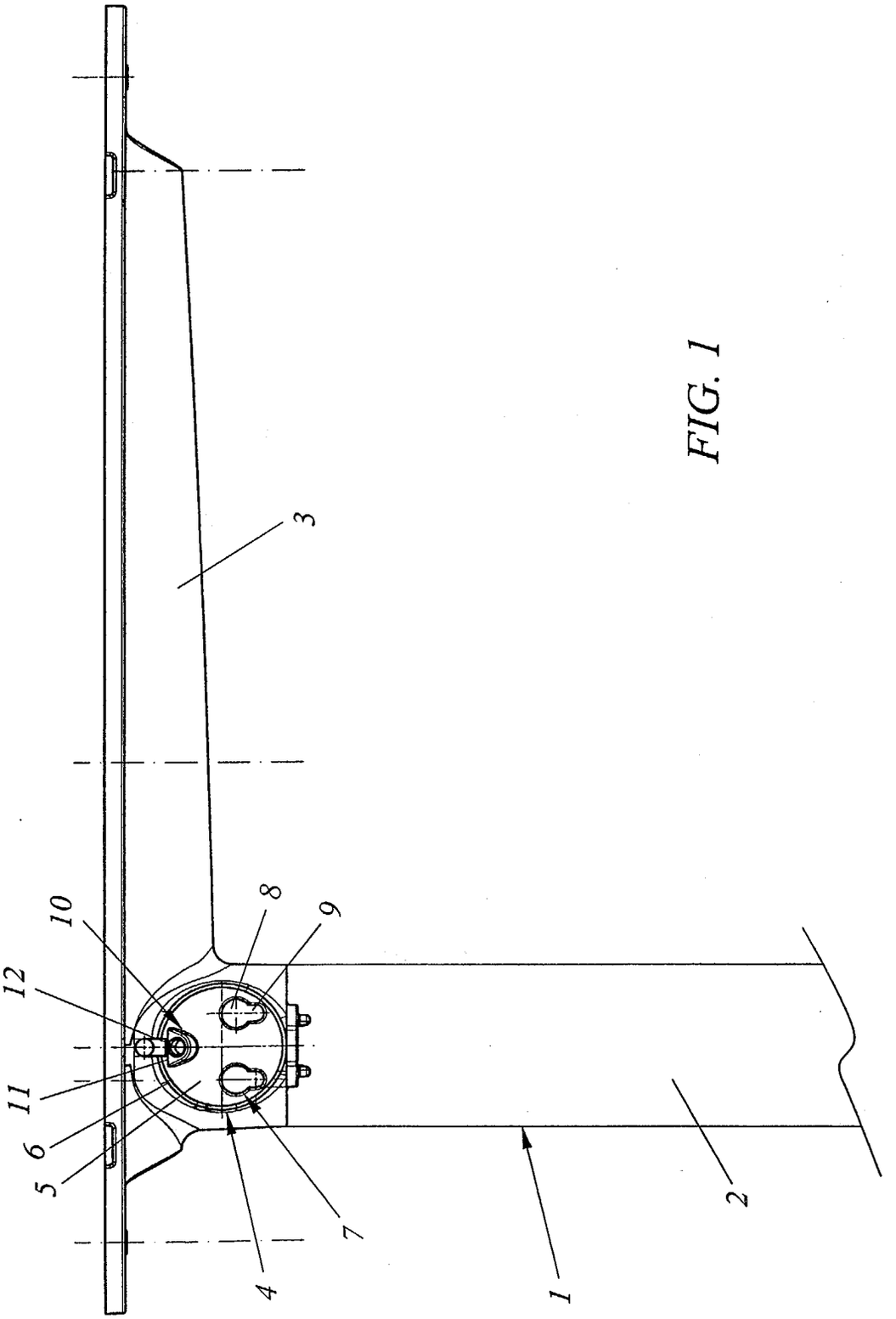


FIG. 1

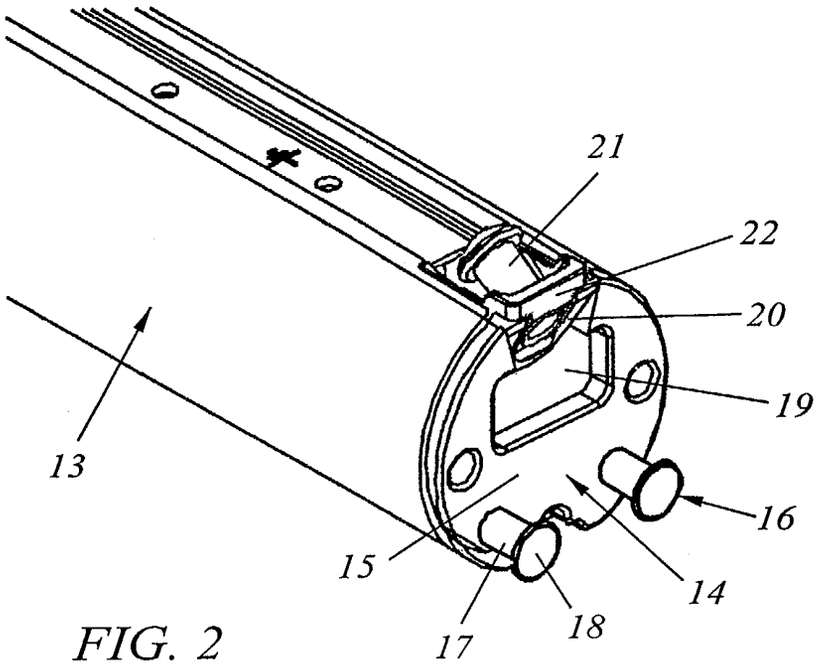
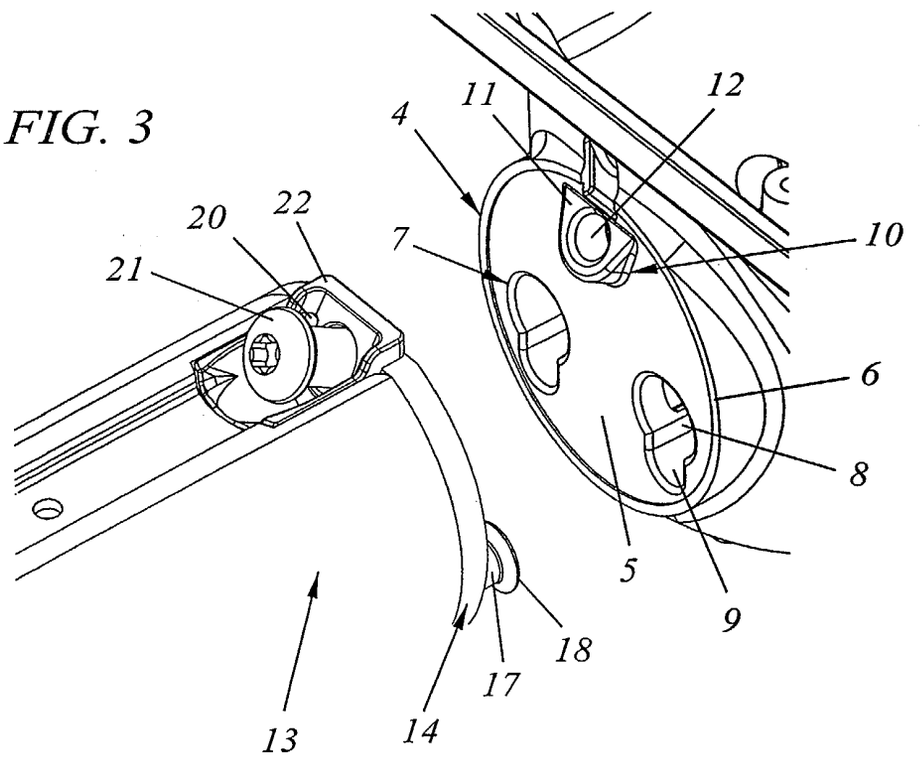


FIG. 2

FIG. 3



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EUROPEAN SEARCH REPORT

Application Number
EP 03 07 6975

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TECHNICAL FIELDS SEARCHED (Int.Cl.7)
A47B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	3 October 2003	Ottesen, R

CATEGORY OF CITED DOCUMENTS

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