The invention concerns a furniture unit according to the preamble of the independent claim 1.

When fitting out kitchens, offices, laboratories or such like, walls which together make up an angle of e.g. 90° should also be used as far as possible for the installation of furniture. However, the corner space often remains unused because the adjoining pieces of furniture placed against the two walls would make at least partially inaccessible furniture which would fill out this corner space.

A furniture unit avoiding this inaccessibility, for installation in a right-angled corner of a room, is described in the patent CH-593 657. This prior art furniture unit has two horizontally sliding built-in units, the outer built-in unit being withdrawable from the basic unit and pivotable around a vertical axis from the corner of the room. The two sliding built-in units are interconnected with levers such that when the outer built-in unit is pivoted around the vertical axis, the built-in unit in the corner is displaced inside the basic unit horizontally in the direction of the latter to the place originally occupied by the built-in unit pivoted outwards. The built-in units used in the prior art design each contain one sliding element. The inside of the element is fitted with storage components, for example, shelves or wire mesh baskets to store the objects to be kept in the furniture unit. The element may be made, for example, from a wooden cabinet which is open at the front or from a welded steel frame.

The prior art design of a furniture unit for installation in the corner of a room has disadvantages due in particular to the size and spatial dimensions of the element. These disadvantages affect above all the assembly of the arrangement, but also its flexibility with regard to use in furniture of varying dimensions and

design. The element is designed as a spatially relatively bulky component to be inserted into the pre-assembled furniture unit, fixed there and connected with the lever system. Due to inaccuracies in production or distortion in the element occurring during assembly, the guides may be warped. The horizontally sliding built-in units can in turn become awkward to move and thus restrict the functioning of the furniture unit. Moreover, because of its dimensions in particular, but also because of its lack of flexibility and adaptability, the prior art furniture unit is scarcely suitable for such applications as envisaged, e.g. through sales via do-it-yourself outlets.

The object of the invention is therefore to provide a furniture unit for installation in a corner of a room, production and assembly of which should be significantly simplified and accelerated and wherein the likelihood of warps in the horizontally sliding built-in units should be excluded as far as possible. In doing so, it is intended that even simpler components than those of the prior art solution should be used.

The object is solved according to the invention by means of the features listed in the characterizing part of claim 1.

It is also an object of the invention to design the mountings used for the sliding device in such a way that it is possible to use them in a variety of differently constructed furniture. Thus the device should for example be adaptable to the dimensions and designs of built-in cupboards which vary according to the standard of a particular country, or be able to be used together with different cover panels such as e.g. granite panels. This is achieved in particular by means of the special design of the guide frame in the first embodiment of the invention.

The invention is described by way of example below in more detail with reference to the drawings in which:

Fig. 1 is a diagrammatic perspective view of a furniture unit according to the invention in the closed state,

Fig. 2 is a diagrammatic perspective view of a furniture unit according to the invention, whereby the outer built-in unit is withdrawn and pivoted outwards,

Fig. 3 is a view of the sliding frame of the outer built-in unit,

Fig. 4 is a perspective view of a first embodiment of the inner built-in unit with accompanying guide frame,

Fig. 5 is an enlarged side view of the first embodiment shown in Fig. 4,

Fig. 6 is a perspective view of a second embodiment of the inner built-in unit with accompanying guide frame and storage component,

Fig. 7 is the top plan view of a furniture unit according to the invention (without cover panel) as per the second embodiment, the outer built-in unit in withdrawn position; the broken line shows the pivoted out position in addition.

According to this invention, the built-in units are essentially designed so that the storage components can be suspended on one side into a flat frame after all the other components have been assembled. This sliding flat frame, referred to hereafter as the sliding frame, is mounted on a similarly flat horizontally sliding guide frame. In contrast to the prior art solution which is fitted with an equivalent lever system, the element is thus no longer designed as one component with one spatial dimension.

Fig. 1 shows a furniture unit according to the invention. A basic unit 1, for example a wooden element, is built into a corner of a room. Within the basic unit there are built-in units 3, 4, each with a number of storage components 14, although for reasons of clarity, the inner built-in unit 3 is fitted with only one storage component 14. The other storage components 14 which can be used on the inner built-in unit 3 and the outer built-in unit 4, are not shown. Any other pieces of furniture 2a, 2b adjoin the basic unit 1. Due to the proximity of the element 2a which adjoins crosswise, the inner built-in unit 3 in a standard furniture unit would not be accessible from outside.

For this reason, CH-593657 proposes a lever mechanism allowing an obligatory displacement of the inner built-in unit 3, when the outer built-in unit 4, after having been withdrawn from the basic unit 1, is then pivoted around a vertical axis. The present invention also makes use of this prior art lever arrangement. Fig. 1 shown the inclined lever 50 which is mounted in such a way that when it cooperates with the connecting lever 60, a kinematic chain is formed via which is achieved a displacement of the inner built-in unit 3 to the possition accessible from outside, when the outer built-in unit 4 is pivoted around the vertical axis 100.

For this purpose the invention intends that the flat sliding frame 80 of the outer built-in unit 4 is mounted on a pivotable guide unit 90 such that it can slide longitudinally. The pivotable guide unit 90 on which is mounted the sliding frame 80 of the outer built-in unit 4, is mounted on the side furthest away from the inner built-in unit 3, and is connected in turn with the basic unit 1 via the hinges 101 forming the vertical pivot axis 100.

A flat guide frame 70 is mounted vertically for the inner built-in element 3 at the back of the furniture

unit. This guide frame 70 has sliding tracks whose purpose is to guide the horizontal displacement of the sliding frame 120 of the inner built-in unit 3. The movements are coupled via the two levers 50, 60.

Fig. 2 shows the furniture unit according to the invention in the state in which it is when the outer built-in unit 4 is withdrawn from the basic unit 1 and pivoted around the vertical axis 100.

Fig. 2 shows in the lower half of the drawing the track component 91 of the pivotable guide unit 90 of the outer built-in element 4, said pivotable guide unit 90 shown here in the position of being pivoted around the vertical axis 100 by almost 90°. It is obvious that the sliding frame 80 and all elements affixed thereto must be withdrawn from the basic unit 1 before carrying out the pivot movement of the guide unit 90.

During this longitudinal displacement of the sliding frame 80, the latter is carried both by the track component 91 of the pivotable guide unit 90 and by the track component 103 of the stationary support unit 102. This stationary track component 103 can be clearly identified in Fig. 2. It should also be recognized that the pivot movement of the inclined lever 50 is engendered in the way already described in CH-593 657 by means of the track component 91 of the pivotable guide unit 90. Due to displacement to the place originally occupied by the outer built-in unit 4, the storage components 14 of the inner built-in unit 3 are now accessible from the front of the piece of furniture. Finally, it can be seen in Fig. 2 that the sliding frame 80 of the outer built-in unit 4 is provided with preferably adjustable fixation means 81, in order to attach a cover face 82 thereto.

Fig. 3 is a side view of the sliding frame of the outer built-in unit 4 in the closed state of the furniture unit, i.e. the sliding frame 80 is in a position of being

pivoted and pushed inwards. The drawing shows another possible form of embodiment of the design of the pivotable guide unit 90 and the guides for the sliding movement of the sliding frame 80 with respect to the guide unit. In contrast to the embodiment shown in Fig. 2, in which the stationary support unit 102 is fitted with a track component 103, in the example shown in Fig. 3, the upper track 83 of the sliding frame 80 is guided solely via guide rollers 92 mounted on the pivotable guide unit 90. The vertical part 93 of the pivotable guide unit 90 is mounted opposite the stationary support unit 102 by means of the two hinges 101.

There is a sliding roller 85 in the region of the end of the lower track 84 of the sliding frame 80 facing the inside of the furniture unit, which sliding roller rolls along the track component 91 of the pivotable guide unit 90. At the opposite end, i.e. at the end facing the front side of the furniture unit, the pivotable guide unit 90 is provided with another sliding roller 94, on which rolls the lower track 84 of the sliding frame 80 when the latter is withdrawn from the basic unit.

The track component 91 of the pivotable guide unit 90 is provided on its bottom edge with a sliding element 95, which serves, in a manner known per se to drive the pivot movement of the inclined lever 50. Fig. 3 shows clearly that when the sliding frame 80 is withdrawn from the basic unit, the sliding roller 85 disposed at the corner of the sliding frame 80 is displaced towards the sliding roller 94 which is connected with the guide element 90, said sliding roller 94 remaining at first stationary in relation to the basic unit.

As already mentioned, various embodiments are possible, particularly with regard to the construction of the guides and mountings of the sliding frame 80. Moreover, additional means may be provided to bring about

an obligatory coordination of the pulling out and pivoting movements of the built-in unit.

Fig. 4 is a perspective view of the most important components of the inner built-in unit. The sliding frame 120 is formed essentially by the vertical struts 121 and the horizontal struts 123, 124. The vertical struts 121 are each provided on their front side at the same height with a number of hooks 122 which are preferably disposed at the same distance to each other. The storage components (not shown) are suspended on these hooks after assembly has been completed. The storage elements are designed, for example, in the form of flat wire baskets, dish-shaped or plate shaped elements. These are suspended on one side of each sliding arm of the inner or outer built-in unit in such a way that they form a right angle with regard to the flat frame. In the case of the wire baskets suspended on the hook-shaped fixation elements 122 shown in Fig. 4, the right-angled protrusion of the storage components from the sliding frame is ensured by the lower portion of the storage components resting against the frame. For this support it is of course necessary that the storage components are of a certain height, i.e. that there is a sufficient gap between the parts cooperating with the hooks 122 and its lower portion.

Another embodiment for the fixation of the storage components 14 against the respective sliding frame is shown in Fig. 6. The respective sliding frame is provided with bores instead of hook-shaped elements, into which the respective fixation elements of the storage component 14 are inserted. The principle of such insertion is known per se and can be seen from the diagram in Fig. 6. Naturally, the embodiment shown in Fig. 6 of the fixation of the storage components 14 against the respective sliding frame can also be used in the case of the

embodiment of the sliding frame shown in Fig. 4. In Fig. 3, in the embodiment of the sliding frame 80 of the outer built-in unit, the latter is provided with bores to engage for example storage components according to the embodiment shown in Fig. 6. Naturally, the embodiment for mounting the storage components against the sliding frame, based on the use of hook-shaped fixation elements according to Fig. 6, can also be used in this embodiment example.

A basic prerequisite for the configuration according to the invention of the respective sliding frame as a flat component is that the storage elements 14 be suspended on one side on the respective sliding frame. In addition to the range of mentioned advantages of the solution according to the invention, the different ways of fixing the storage components ensures excellent handling and flexibility thereof. Thus the storage components can simply be changed or, in order to permit cleaning work, for example, they can simply be removed. This results in simple and good access to the built-in components.

The horizontal struts 123, 124 of the sliding frame 120 which can be seen in Fig. 4, are fitted on the back side with a number of guide rollers 125, 126, 127, whose purpose is to guide the longitudinal movement of the sliding frame 120 against the rigid guide frame 70.

The rigid guide frame 70 comprises two struts 71 running at an appropriate distance from each other in the horizontal direction, which serve as tracks for rollers on the sliding frame 120. These tracks 71 are interconnected at the rear by means of two vertically running connecting struts 72. These connecting struts 72 are fitted on the underside with supporting feet 73 which can be affixed to the floor. They are preferably provided with holes to allow the fixation of these supporting feet 73 to the floor.

To fix the stationary guide frame 70 at the side, the tracks 71 are provided at each end with support arms 75. The support arms 75 end with flange plates 76, which in turn are preferably provided with bores and are suitable for affixation to a wall. The support arms 75 are each inserted in a housing 74, so that the former can be displaced in the direction of the tracks 71. The housings 74 are each fitted with a threaded hole, in which there is an adjusting screw 77. The inner cross-section of the housing 74 has a preferably square cross-sectional shape which corresponds with the outer cross-section of the support arm 75, and the housings 74 are mounted preferably with a welded joint, at the back and at each end of the track 71. Using the described construction of the support arm it is possible to adjust the latter, i.e. to adjust the distance of the flange plates 76 with regard to each end of the track 71. In this way, the guide frame 70 can be efficiently adapted to a wide variety of arrangements.

The cross-section of the housings 74 preferably corresponds to that of the connecting struts 72, or at least their inner cross-section corresponds to the outer cross-section of the support arm 75. Firstly, this has the advantage that both parts can be manufactured from the same semifinished product and also provides the particular alternative of one pair of support arms 75 also being able to be used in the vertical direction inside the connecting strut 72. In the same way as already described with reference to the housings 74, there is a threaded hole in the upper region of the connecting strut in order, in cooperation with an adjusting screw, to ensure that the support arm used in the upwards direction can be adjusted. This allows a sufficient fixation of the stationary guide frame 70 to be undertaken even if the conditions of installation do not permit the horizontally disposed support arms to be attached at both sides. In such a

case, the guide frame 70 could for example be fixed to the ground, to a side wall (right or left) and to the cover plate closing off the furniture unit at the top.

Fig. 5 clearly shows the way in which the sliding frame 120 is guided along the tracks 71 of the guide frame 70 with the aid of the rollers 125, 126, 127 which are each present as a pair. This figure gives a side view of the components shwon in the previous Fig. 4, although in Fig. 5, said components are shown in their assembled, ready-to-operate state. Recognizable again is the stationary guide frame 70, which is formed essentially of the horizontal struts 71 acting as tracks and the vertical connecting struts 72, ending at the bottom in the form of the supporting feet 73. The sliding frame 120 of the inner built-in unit is formed by the struts 121, 123, and 124, the horizontally running struts 123, 124 carrying the corresponding sliding rollers 125, 126, 127. These are pivotably connected with the corresponding strut in a known way, for example by means of stationary axes. The pairs of rollers 125, 126 are horizontally oriented, i.e. they rotate around vertical standing axes. In the context of their arrangement in the corresponding track 71 it is clear that these pairs of rollers 125, 126 rotating around vertical axes, assume the guiding of the sliding frame 120 in the horizontal direction. It is obvious that the diameter of the rollers 125, 126 has to be slightly smaller than the inner width of the profile 71. This ensures that the horizontal guiding of the sliding frame 120 takes place with as little play as possible and also that no frictional rubbing occurs between the track and the roller.

The sliding frame 120 is guided vertically with regard to the stationary guide frame 70 by means of the pair of rollers 127. It can be seen that the roller 127 shown in Fig. 5 is vertically disposed, i.e. it rotates

around a horizontal axis which is connected with the lower horizontal strut 124. The roller 127 rolls along the upper surface of the lower track 71.

The assembly of the sliding frame 120 on the guide frame 70 should preferably take place before mounting the latter inside the basic unit in such a way that the sliding frame 120 is pushed up by one end of the tracks 71 onto the latter. However, if this is not possible, it is certainly also possible to assemble the sliding frame 120 by pushing the rollers of one side of the sliding frame 120, those of the left side, for example, onto the corresponding, i.e. also the left end for example of the tracks 71 and by subsequently moving the sliding frame mounted on one side to the other end, i.e. the right end of the guide frame 70 and then there pushing the rollers of the other side of the sliding frame from the appropriate side onto the tracks 71 of the guide frame 70.

Fig. 6 shows another form of embodiment regarding the design of the inner built-in unit comprised of, for the most part, flat components. In contrast to the previously described embodiment whereby the sliding frame of the inner built-in element is guided by means of a stationary guide frame disposed vertically in the rear region of the furniture element, in the embodiment now to be described, the guide frame is disposed horizontally in the upper region of the furniture element. The guide frame 7 consists of a pair of tracks 7b, which are interconnected by means of connecting struts 7a. The sliding frame 12 is designed as a two-part unit, consisting of a carriage 12a and a carrier frame 13, on which the storage components 14 are suspended.

The carriage 12a which can be displaced along the tracks 7 via sliding rollers 15, consists of a frame formed from a pair of longitudinal struts 16 and transverse struts 17 and a diagonal strut 17a, with vertical

struts 18 extending downwards from the back edge of said frame. The bottom end of the vertical struts 18 is connected by means of support struts 19 with the front portion of the frame, i.e. with the front portion of the transverse struts 17, in order to take up the bending moments acting on the vertical struts 18. The vertical struts 18 of the carriage 12a are formed preferably from L-profiles and welded with the frame formed from the longitudinal and transverse struts 16, 17. The vertical struts 18 are each provided in their upper portion with a bore 20 running in the longitudinal direction of the track 7b. Support pins 21 are each connected, for example soldered, rigidly with the upper end of the carrier frame 13 of the inner built-in element. The distance between the two vertical struts 18 is such that the carrier frame 13 just has room between the L-profiles. The support pins 21 engage with the bores 20 in the vertical struts 18 after the carrier frame has been assembled.

To assemble the carrier frame 13 it is pressed together in the open, upper portion to such an extend that the outer ends of the support pins 21 can be inserted from the inside into the bores 20. When the pressure on the carrier frame 13 is released, it springs back and now rests on the support pins 21 mounted in the bores 20 and its position is simultaneously fixed by the L-profiles of the vertical struts. The back sides 18a of the L-profiles in particular prevent the hanging carrier frame from tilting backwards.

Fig. 7 shows a top plan view of a furniture unit according to the second embodiment of the invention, the cover plate of the furniture having been removed. The drawing shows with the broken line the condition where the inner built-in unit 3 is in place and the outer built-in unit 4 is withdrawn from the basic unit. In the upper portion the horizontally disposed stationary guide frame

7, the carriage 12a and the way in which the levers 50, 60 operate can be seen. The inclined lever 50 is pivotable around a centre of rotation 51 fixed on the floor of the basic unit and designed as a guide 52 on the side which is connected wiht the track portion 91 of the pivotable guide unit 90. A slide component 95 connected with the track component 91 slides in this guide 52. At the end lying on the other side of the centre of rotation 51, the inclined lever 50 is connected with a connecting lever 60, which in turn is attached to the sliding frame of the inner built-in unit.

The dot-dash lines show the position which the components assume, in particular the lever system, when the outer built-in unit 3 is pivoted around the vertical axis 100 thus displacing the inner built-in element to the then free space.

Use of the invention shown permits realization of a furniture unit for installation in a corner of a room with simpler means and fewer components than before. The individual parts provided for by the invention are suitable for a variety of embodiments and dimensions of the furniture; the assembly of the built-in units consisting essentially of flat parts is considerably simplified and the operating reliability, i.e. reliability with regard to jamming and blocking of the movable elements, is significantly increased.

Patent Claims

1. A furniture element for installation in a corner of a room, there being two horizontally sliding built-in units (3, 4) housed next to each other and within a basic unit (1), said built-in units being linked with levers (50, 60) such that when the outer built-in unit, which is displaceably mounted on a pivotable guide unit (90), is tilted by almost 90° around a vertical axis (100) and pushed out of the basic unit at the front side, the inner built-in element is displaced towards the free space or away from the free space, characterized in that the built-in units are each formed by a vertically disposed flat sliding frame (80, 120; 12) and a number of storage components (14) which are suspended on one side of each sliding frame and which protrude horizontally therefrom, and in that the sliding frame (120) of the inner built-in unit (3) is mounted displaceably on a stationary, flat guide frame (70; 7).

2. A furniture unit according to claim 1, characterized in that the guide frame (70) is vertically disposed in the rear portion of the basic unit.

3. A furniture unit according to claim 2, characterized in that the stationary guide frame (70) has an upper and a lower guide track (71) to engage the sliding frame (120), in that the sliding frame (120) has several sliding and guide rollers (125, 126, 127) which cooperate with the guide tracks (71) of the guide frame (70).

4. A furniture unit according to one of the claims 2 or 3, characterized in that the stationary guide frame (70) can be fixed to the floor of the room or to the basic unit by means of supporting feet (73) present on its

underside, and can be fixed to one or two opposite side walls by means of support arms (75) on the right and/or the left end of the frame, and/or can be fixed to a cover plate by means of support arms at the upper end of the frame.

5. A furniture unit according to claim 4, characterized in that the distance between each of the support arms and the frame end is adjustable.

6. A furniture unit according to claim 1, characterized in that the guide frame (7) is disposed horizontally in the basic unit above the built-in unit and in that the sliding frame (12) of the inner built-in unit is displaceably connected with the guide frame (7) by means of a carriage (12a) running on the guide frame (7), the sliding frame (12) also comprising a carrier frame (13) which is open at the top and has support pins (21) on both sides of its upper portion which project from the frame, to cooperate with bores (70) in vertical struts (18) of the carriage (12a) and the carrier frame (13) being able to be assembled by elastically pressing together the two sides of the upper portion of the carrige (12a), in that the vertically running struts (18) of the carriage (12a) provided with bores (20) to engage the support pins (21), are extended downwards to support the moment of tilt emanating from the storage components (14).