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Description

The invention relates to an equipment storage means, in particular a drawer cabinet, which has a body or a frame to accommodate drawers, guide means being provided, with which drawers can be pulled out and pushed in, at least one optical display means being provided, by means of which signals provided by a controller of the equipment storage means about state information of the drawers can be displayed in an optically perceivable manner.

Objects that represent a high value must often be stored temporarily, above all in the field of industrial manufacture. This can involve tools, measuring instruments, components and the like, whose value can quite easily represent a four-figure or even five-figure sum in euros. A tendency has, however, been noticed for such objects to be more and more often misappropriated from equipment storage means, even from factories and works facilities whose access is restricted to specific groups of persons. Companies are in this way subject to quite significant financial damage.

For this reason amongst others, tool cabinets have already been developed whose access is controlled through an entry or access authorization system. With this it should be possible for entire cabinets and individual drawers to be locked or opened from a central location. Since the drawers are usually partitioned with dividing means, and stored materials with different access authorizations can be present in the individual compartments of the drawers, frames for covering drawers, whose size corresponds exactly to the respective drawer surface, are also offered. The frame is to be placed onto the drawer from above and fastened to it. It has a matrix-like structure, and has an opening, accessible from above, that can be locked and enabled with a pivoting flap for each compartment of the respective drawer. An enable request button at the frame is assigned to each flap, from which an enable for opening the specific flap can be requested, or a

flap can be opened, by a superordinate access enable device. Depending on the rules stored in the access authorization device that relate to the authorization of individual users to be allowed access to individual compartments, either the locking device of the corresponding drawer and the corresponding flap of the drawer are then unlocked, or, however, the locking is retained.

The applicant already has drawer cabinets and other equipment storage means based on drawers in their range, wherein state or status information about individual drawers is displayed on the front side. Status information of this sort can in particular - although not exclusively - be enable information about the corresponding drawer and sections within this drawer. The former solution has however the disadvantage of high technical effort because of the necessary cabling expense, in which cable and/or sliding contacts must be laid into the drawers so that energy and signals are available at the drawers.

A drawer cabinet is also disclosed in US 2005/0113970 A1, at the body front of which LED lamps are attached. The LEDs are arranged in a vertical row with a forward radiation direction, essentially perpendicular to the front of the cabinet and the drawers, and should display status information relating to the drawers through illumination at the body.

The invention is therefore based on the object of creating a possibility for equipment storage means of the type referred to at the beginning, through which optically perceivable state and/or status information can be displayed at drawers with less technical effort than previously.

This object is achieved according to the invention with an operating means of the type referred to at the beginning through the features of Claim 1 which comprise at least one light-emitting means operatively connected to the controller of the equipment storage means, which is arranged at the frame

or body of the equipment storage means, wherein the at least one light-emitting means of the at least one drawer can be switched on and off by means of the signals supplied by the controller, and wherein drawer display means are provided with which light transmitted/emitted by the light-emitting means in the direction of the drawer in a contactless manner can be brought to the drawer to be displayed. With this it is possible, with low technical effort, to feed information signals and/or status signals for optical perception by persons to each drawer, independently of other drawers, without the light-emitting means having to be arranged at one of the drawers.

It is furthermore preferred if the at least one light-emitting means arranged on the frame or on the body is aimed toward at least one drawer display means arranged on one of the drawers, in order that light emitted by the light-emitting means can be displayed on the drawer at its drawer display means as an optically perceivable signal.

One preferred development of the invention can provide that the light-emitting means are arranged at least approximately vertically one behind another. Such a solution can, for example, be realized through an economical LED strip, in which the individual LEDs are grouped in one component and can be switched by the controller as independently from one another as possible. LEDs are suitable as light-emitting means in connection with the present invention, but also, independently of forms of embodiment in which a plurality of light-emitting means are grouped together as an LED strip. The invention thus also includes preferred forms of embodiment with multiple, but separately arranged, LEDs or also other light-emitting means.

A short distance between the at least one light-emitting means and a suitable location of the respective drawer that is particularly favourable for a contactless transmission of the light for the at least one display means at the drawer can, for example, be realized in that the at least one light-

emitting means is arranged in the region of a front opening of the frame or body from which the drawers can be pulled out of the frame or body and pushed in. The same advantage results from an advantageous development of the invention in which, when drawers are pushed in, light-emitting means are located immediately opposite front faces of handle strips of the drawers.

In one particularly preferred form of embodiment of the invention, it can be provided that the light from at least one light-emitting means is either guided directly to the drawer front or indirectly via light guide means to the drawer front. In this connection, a handle element, for example a handle strip, that is provided for operating the drawer by a user when pulling the drawer out of and pushing it into the cabinet body should be thought of as part of the drawer front, even if the handle element is a separate component or a separate assembly. The information about or relating to the corresponding drawer displayed by the respective light-emitting means through contactless transmission of the light or the light signals can be read at the respective drawer front as optically perceivable information. At least a doubling of the optical information and signals that can be transmitted to the drawers can be achieved according to the invention wherein light-emitting means are arranged at two different, in particular opposite, sides of the opening at the frame or body of the equipment storage means.

Preferably an increase in the number of items of different optical information that can be displayed at a respective drawer can be achieved in that light-emitting means that can output light in different colours are employed. In a further form of embodiment according to the invention, different items of optical information can - alternatively or in addition to the previously described possibilities - also be achieved, in particular with the same light-emitting means, through different flashing sequences generated by these light-emitting means.

In one particularly preferred form of embodiment of the invention, means can be provided at least one of the drawers by means of which optical signals transmitted in a contactless manner to the drawer can be transferred from a receiving location of the optical signal at the drawer to another location of the drawer, in particular through at least one light-guiding element arranged at the drawer or at its handle strip. Such a preferred form of embodiment of the invention can, in particular, comprise a transparent handle strip toward the at least one front face of which - when the drawer is in the pushed-in state and the light-emitting means in the switched-on state - the light of the light-emitting means is aligned, and the light is introduced, in particular in a contactless manner, into the handle strip. The light can hereby be passed on to an arbitrary location of the handle strip, and the corresponding information that is displayed. Semi-transparent or non-transparent handle strips can, of course, also be provided in the place of transparent strips.

Further preferred forms of embodiment of the invention emerge from the claims, the description and the drawing.

The invention will be explained in more detail with reference to the exemplary embodiments illustrated in a purely schematic manner in the figures. Here:

Fig. 1 shows a perspective illustration of a drawer cabinet according to the invention;

Fig. 2 shows a detailed illustration of the drawer cabinet of Fig. 1;

Fig. 3 shows a partly cutaway detailed illustration of a corner region of the drawer cabinet of Fig. 1.

Fig. 1 shows a drawer cabinet 1, as is largely typical for the storage of operating and production means, as well as for

tools in the field of production or craft. The drawer cabinet 1 comprises a body 2 made of metal plate. Each of the drawers 3 is provided with drawer pull-outs 4, for example what are known as full pull-outs having a telescope-like construction. By means of the drawer pull-outs, known per se, individual drawers 3 can be pulled out of the body 2 and moved back into the body 2.

The drawer cabinet 1 can be provided with an access authorization device and with a pull-out stop. The simultaneous withdrawal of more than one drawer - and thereby also a risk of tilting resulting from too many drawers 3 being pulled out - can be prevented by the pull-out stop. By means of the access authorization device it is possible, preferably in a changeable manner, to determine which drawers 3 are enabled for being pulled out of the body 2, and which drawers 3 are blocked from being pulled out. Different access authorizations can be present for different users and/or groups of users, and can be set in a preferably changeable manner. The respective data regarding access authorizations are stored in a changeable manner in a controller of the drawer cabinet 1 and/or a common controller of a plurality of drawer cabinets 1. Both the access authorization device as well as the pull-out stop can make use of the same locking mechanism with which a drawer 3 and/or a group of drawers 3 of the drawer cabinet 1 can be locked against being pulled out separately from other drawers 3. For this purpose, for example, a plate arranged in the region of the rear face of the respective drawer can interact with a locking profile arranged in the region of the rear wall of the body (not illustrated in the figures). A drawer 3 pushed into the body 2 hereby engages with the locking profile and, depending on the setting of the locking profile, can capture the plate with positive lock, or engage behind or enable it, so that the plate, and thereby the drawer belonging to the respective plate, is locked against being pulled out. The present invention is not restricted to this type of a mechanical locking or enabling by a pull-out stop as described here. The

invention can in principle be used with any arbitrary pull-out stop and any arbitrary access authorization device. It is, moreover, also possible to use the invention without a pull-out stop.

As is illustrated in Figs. 1 - 3, a vertically aligned row 8 of light-emitting diodes 9 is arranged at the body 2 in the region of the respective front ends of the two side walls 6, 7. The light-emitting diodes 9 arranged on one side each of the drawers 3 are designed in the exemplary embodiment as respective one-piece LED strips 10 or LED tape, preferably located in a protective tube or protective sleeve to protect from damage. Any other type of light-emitting means can also be provided in the place of light-emitting diodes 9 as the light-emitting means, for example incandescent bulbs and/or luminous foils. The light-emitting diodes 9 are located at inner sides of the edges 14 of the opening of the body 2, with which the body 2 surrounds the front sides 3a of the drawers 3 when pushed in. In each of the two rows 8 of light-emitting diodes, which are aligned essentially parallel to one another and vertical, each light-emitting diode 9 can be switched on and off independently of the other light-emitting diodes 9 of this row 8 by a controller of the drawer cabinet 1 by means of appropriate signals. Each light-emitting diode 9 of each of the two LED rows 8 is thus assigned to only one drawer 3, and is therefore located in each case immediately opposite a front face of the drawer 3 respectively assigned to it. The consequent total of at least two light-emitting diodes 9 for each drawer 3 (one light-emitting diode in each case at each front face 20 of the handle strip 21) can also be actuated independently of each other. It is in particular thus possible to signalize two different items of information on or about the drawer simultaneously by means of the two LEDs for each drawer 3; “no access possible” or “outside operating hours”, for example. In other exemplary embodiments, only altogether one row 8 of light-emitting means, or also a plurality of rows 8 of light-emitting means on one or both sides respectively, can be provided.

Equally, in other forms of embodiment of the invention a different number of light-emitting means can also be provided for each drawer, in particular at least two light-emitting means at at least one or both of the front faces of the drawers. It can equally also be provided in forms of embodiment of the invention, that at least one light-emitting means is provided in each case at only one front face of the drawers. In each of the conceivable forms of embodiment of the invention, light-emitting means other than LEDs can also be provided; equally, different types of light-emitting means can also be employed in one form of embodiment, for example incandescent bulbs and/or luminous foils.

According to the preferred form of embodiment of Fig. 3, the LED strip 10 is arranged in an undercut 22 of the front-side frame of the body 2, so that the LED strip 10 is largely covered from the outside, and is barely visible if at all. As is illustrated in Figs. 2 and 3, the LEDs 9 of the LED strip are each located directly opposite the front faces 20 of the handle strips 21 of the drawers. A handle strip cover 23 is attached at each front face 20 of the handle strip 21. The handle strip cover 23 can comprise a surface 24 facing toward the respective LED and at a small distance from the LED, so that the LED assigned to handle strip cover 23 outputs and radiates its light emission at least in the direction amongst others onto the surface 24 of the handle strip cover 23. The surface 24 of the handle strip cover 22 that is irradiated by the respective LED is thus illuminated, and can be recognized as such by a user of the drawer cabinet. In this exemplary embodiment, handle strip covers 23 of the drawers have the function of drawer indicator means that bringing the emitted light to be displayed at the respective drawer. Since the respective LED signals a specific item of information, such as, for example, the existence of access authorization for this drawer, or “malfunction”, or “access time elapsed”, a user can read or learn this optically perceivable information at the corresponding front face 20 of the handle strip 21. To

improve the recognizability of the optical signal at the front face 20 of the respective handle strip 21, the front face 20 can be provided with (particularly strongly) reflecting material. An inclined orientation or a convexity of the surface 24 front face 20 can equally be provided, so that the light transmitted from the respective LED to the front face does not impinge upon it along an optical axis aligned orthogonally to the surface of the front face, and the impinging light - with reference to the front side 3a of the drawer 3 - is reflected forwards in front of the drawer 3.

In a further form of embodiment of the invention, not illustrated, LEDs or other light-emitting means are again arranged in the region of the opening of the body. Here again the LEDs radiate light in the direction of the front face of the handle strips of the drawers respectively assigned to them, wherein the light-emitting means are actuated, i.e. switched on and off, by the respective controller. In contrast to the previously described form of embodiment of the invention, however, the light impinging on the front face of the respective handle strip is not reflected from there, but is guided from the front face of the handle strip into the handle strip. The handle strip can be designed to be transparent, at least in a partial region of itself, so that the light introduced into the handle strip can be recognized or is optically perceivable from outside. It can in addition be provided that light guide means are present in or at the handle strip, with which light can be guided into a region in the direction towards the middle or the opposite other front face of the respective drawer, in order to be displayed at an arbitrary, but predetermined, location of the handle strip or of the drawer front. The light generated by the light-emitting means can hereby be transmitted in a contactless manner and also displayed at locations at the drawer or its handle strip that are remote from the respective light-emitting element. In appropriate cases it is equally possible with this for the handle strip also to be illuminated over its entire length.

In other forms of embodiment according to the invention, instead of a front face of a handle strip, another element of the drawer, in particular the drawer front, can be illuminated by at least one light-emitting means arranged at the side at the body frame. Equally, instead of introducing light into a handle strip, light can be introduced into another element arranged at the drawer through which the respective light can be recognized from outside as belonging to the respective drawer. Moreover, a light guide element can also be arranged at the front side instead of in or at the handle strip, by means of which light can be received in a contactless manner from the light-emitting means that is not arranged at the drawer, and this light transferred to an arbitrary location of the drawer front in order to be displayed there. Finally, the light originating from one or a plurality of light-emitting elements can also be output to the front side of the respective drawer itself, in order to make optically perceivable signals for the transmission of information about the respective drawer available there.

In each of the forms of embodiment according to the invention, in particular in the case of the previously described forms of embodiment, more than one light-emitting element can also be provided if required. In particular, at least two or more light guide elements can each be arranged in a drawer at at least one, or a plurality, or all drawers. The display of different items of information can here be assigned to each light guide element such as, for example, “outside operating hours”. To better distinguish the different items of information, different light guide elements of a drawer can output light in different colours. In addition or alternatively it can be provided that a light guide element displays different light signals for the display of different items of information, for example flashing sequences with different on and/or off times and/or different brightnesses, changeable brightnesses, colour change, in particular stepless and/or hard colour change.

In further exemplary embodiments according to the invention, merely a frame can be provided in the place of the body, for example a frame belonging to a storage rack.

List of reference signs

1	Drawer cabinet	21	Handle strip
2	Body	22	Undercut
3	Drawer	23	Handle strip cover
3a	Front side	24	Surface
4	Drawer pull-out		
6	Side wall		
7	Side wall		
8	Row		
9	Light-emitting diodes (LED)		
10	LED strip		
14	Edge		
20	Front face		

Patentkrav

1. Driftslagermiddel, især et skuffeskab (1), der har et korpus (2) eller et stativ til optagelse af i det mindste en skuffe (3) til driftslagermidlet, hvor der er indrettet føringsmidler, med hvilke den i det mindste ene skuffe kan trækkes ud og skubbes ind, hvor der er indrettet i det mindste et optisk visningsmiddel, ved hjælp af hvilket signaler, der er tilvejebragt af en styring for driftslagermidlet, om tilstandsinformationer for den i det mindste ene skuffe kan vises optisk observerbart, hvor der er indrettet i det mindste et lysemitteringsmiddel, der med henblik på signalforsyning er aktivt forbundet med driftslagermidlets styring, og som er anbragt på driftslagermidlets stativ eller korpus (2), hvor det i det mindste ene lysemitteringsmiddel for den i det mindste ene skuffe (3) kan ind- og udkobles ved hjælp af de af styringen tilvejebragte signaler, hvor der som optisk visningsmiddel er indrettet skuffe-visningsmidler, med hvilke lys, der af lysemitteringsmidlet er overført/sendt kontaktløst i retning mod skuffen (3), kan bringes til visning på skuffen, og kendetegnet ved, at der er anbragt lysemitteringsmidler på to over for hinanden liggende sider af korpusåbningen på driftslagermidlets stativ eller korpus (2).

2. Driftslagermiddel ifølge krav 1, kendetegnet ved flere lysemitteringsmidler, der er anbragt på driftslagermidlets stativ eller korpus (2), og som hver især er tilordnet til kun én af flere skuffer (3).

3. Driftslagermiddel ifølge i det mindste et af de foregående krav, kendetegnet ved, at det i det mindste ene lysemitteringsmiddel, der er anbragt på stativet eller på korpusset (3), er rettet mod i det mindste et på en af skufferne (3) anbragt skuffe-visningsmiddel, for at lys, der er emitteret af lysemitteringsmidlet, kan vises på skuffen (3) som optisk observerbart signal.

4. Driftslagermiddel ifølge i det mindste et af de

foregående krav, kendetegnet ved, at lysemitteringsmidler er anbragt i det mindste cirka vertikalt efter hinanden.

5. Driftslagermiddel ifølge i det mindste et af de foregående krav, kendetegnet ved, at lysemitteringsmidler er anbragt i området ved en forreste åbning i stativet eller korpusset (2), ad hvilken åbning skufferne (3) kan trækkes ud af stativet eller korpusset (2) og skubbes ind.

6. Driftslagermiddel ifølge i det mindste et af de foregående krav, kendetegnet ved, at lysemitteringsmidler ved indskubbede skuffer (3) befinder sig umiddelbart over for frontsider af gribelister (21) på skufferne.

7. Driftslagermiddel ifølge i det mindste et af de foregående krav, kendetegnet ved, at lys fra i det mindste et lysemitteringsmiddel enten som emitteret lys er rettet mod fronten af den til lysemitteringsmidlet tilordnede skuffe eller via lysledermidler kan ledes til skuffens (3) frontside.

8. Driftslagermiddel ifølge i det mindste et af de foregående krav, kendetegnet ved, at lysemitteringsmidler er udformet som LED's (9).

9. Driftslagermiddel ifølge i det mindste et af de foregående krav, kendetegnet ved flere lysemitteringsmidler, der er udformet som LED-striber (10), hvor LED-striberne (10) er anbragt på stativet eller korpusset (3) og strækker sig i vertikal retning langs flere over hinanden anbragte skuffer (3), fortrinsvis samtlige skuffer.

10. Driftslagermiddel ifølge i det mindste et af de foregående krav, kendetegnet ved i det mindste et lyslederelement, der er tilordnet til en skuffe (3), fortrinsvis kun én skuffe, og som er indrettet til indledning af lys, der er emitteret af et af lysemitteringsmidlerne, ind i en skuffefront og/eller i en gribeliste (21).

11. Driftslagermiddel ifølge krav 10, kendetegnet ved, at et yderligere lyslederelement er anbragt på skuffefronten og/eller på gribelisten.

12. Driftslagermiddel ifølge i det mindste et af de foregående krav, kendetegnet ved en transparent gribeliste (21), mod hvis i det mindste ene frontside i skuffens (3) indskubbede tilstand og i lysemitteringsmidlets indkoblede tilstand dettes lys er rettet.

13. Driftslagermiddel ifølge i det mindste et af de foregående krav, kendetegnet ved, at der til skuffer (3) hver især er tilordnet lysemitteringsmidler, med hvilke der kan emitteres lys i forskellige farver, for ved hjælp af forskellige farver at vise forskellige informationer.

14. Driftslagermiddel ifølge i det mindste et af de foregående krav, kendetegnet ved lysemitteringsmidler, som med henblik på informationsformidling kan sættes i i det mindste en blinkmodus, fortrinsvis i forskellige blinkmodi.

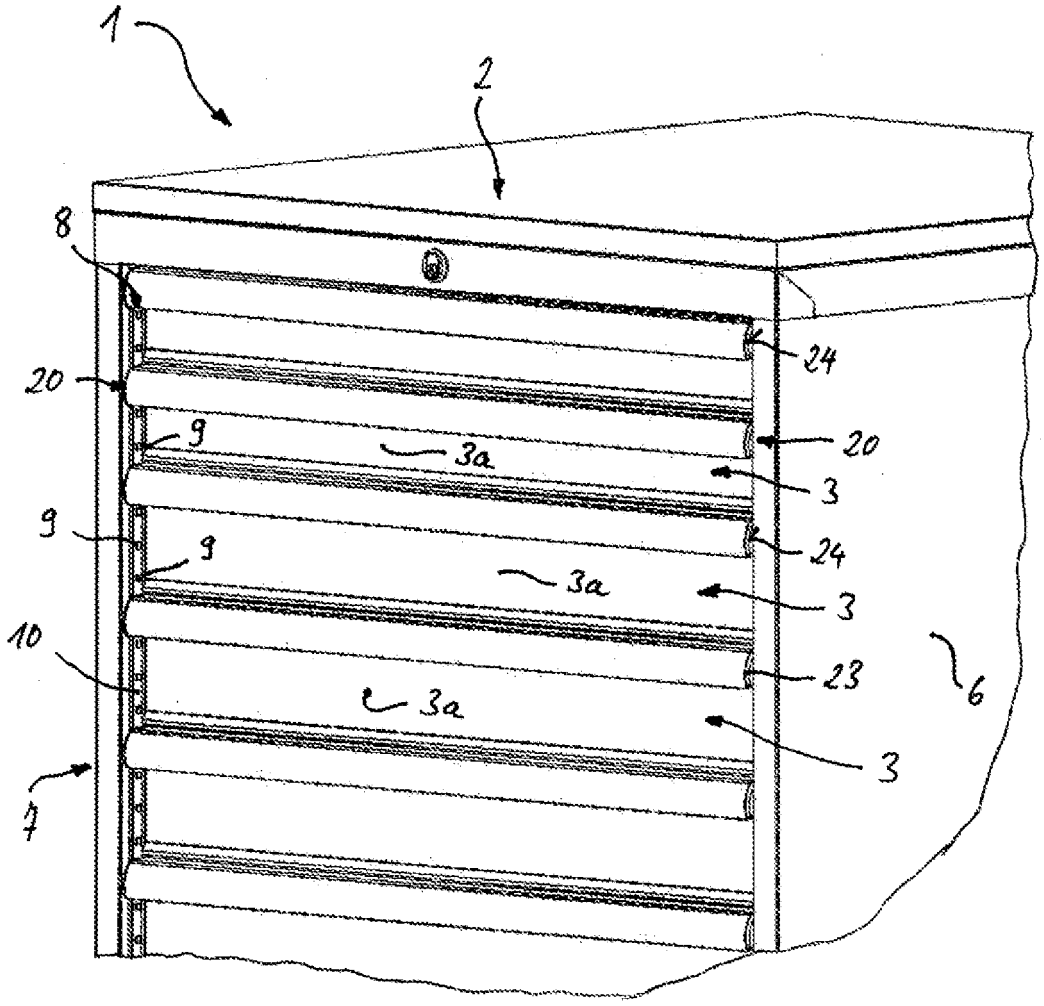

Fig. 1

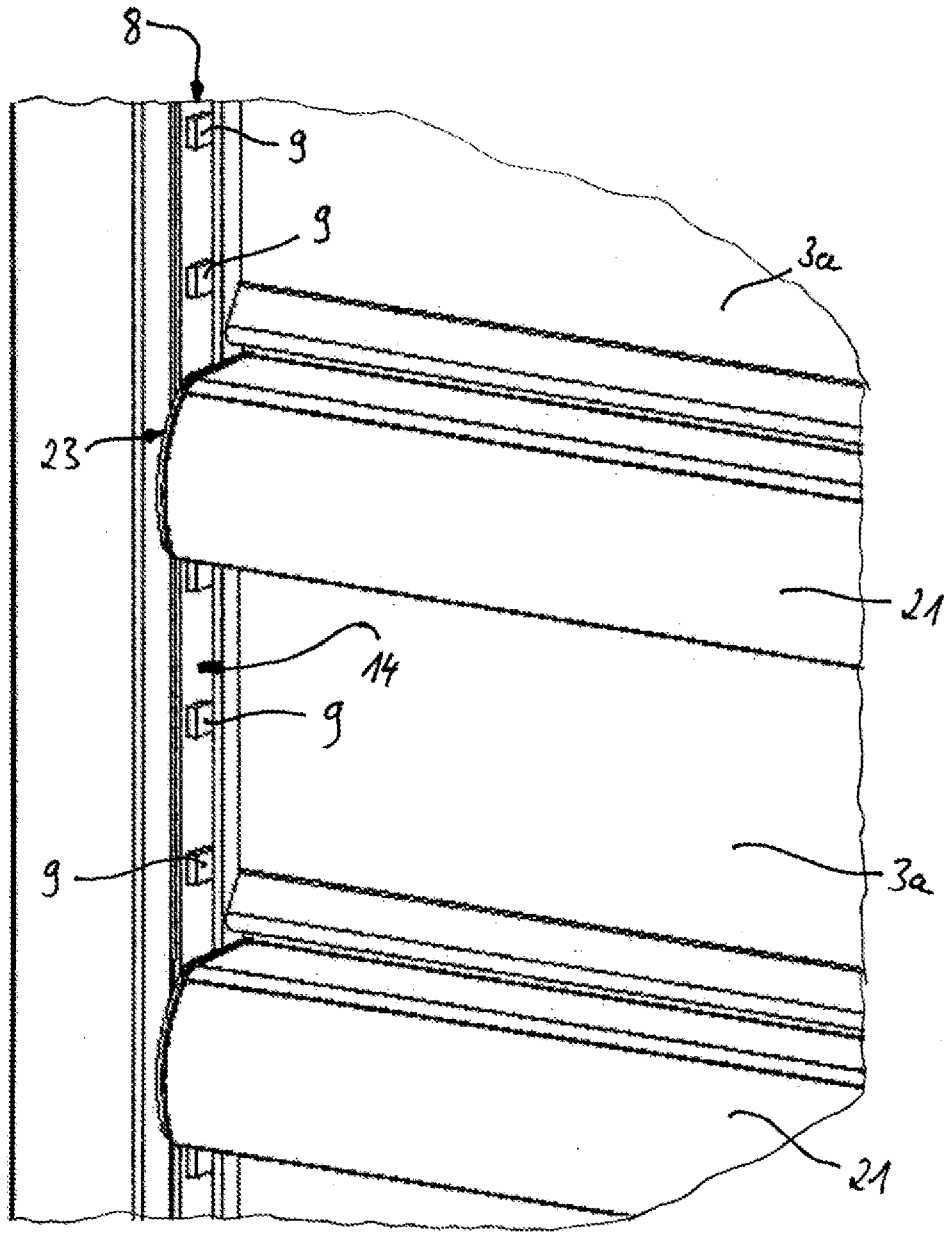

Fig. 2

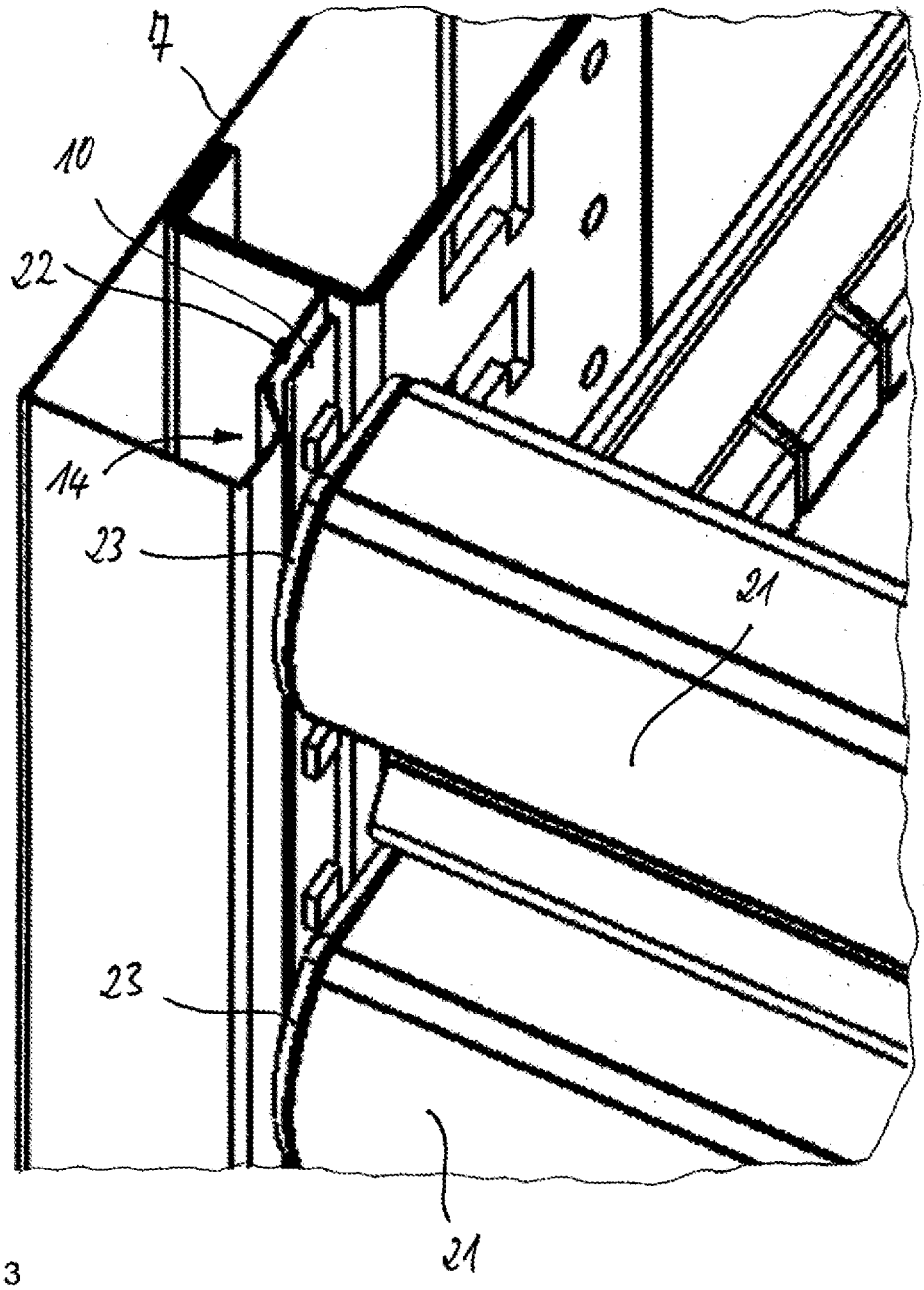

Fig. 3