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(54) FURNITURE DRAWER

(76) Inventor: Wolfgang Held, Hard (AT)

Correspondence Address:
EUGENE J. PAWLIKOWSKI
OFFICE OF GENERAL COUNSEL
U.S. DEPARTMENT OF COMMERCE
WASHINGTON, DC 20230

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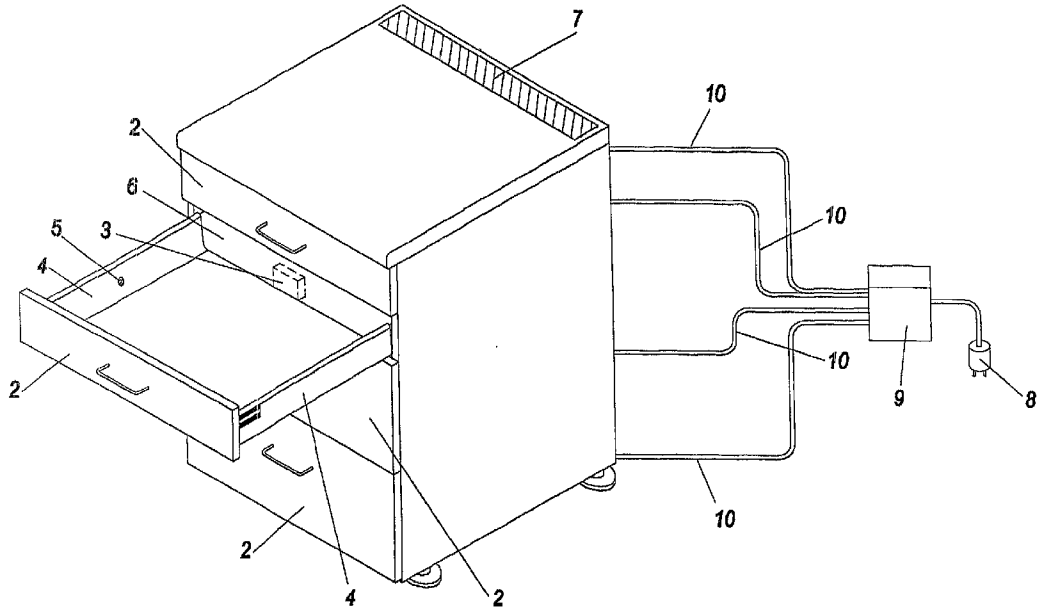
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(57) ABSTRACT

Furniture drawer that can be mounted in a furniture carcass such that it can be pulled out, characterised by a device (12*a*, 12*b*; 12*a*', 12*b*') for transmitting electrical energy to at least one chargeable current storage means arranged in or respectively on the drawer (2).



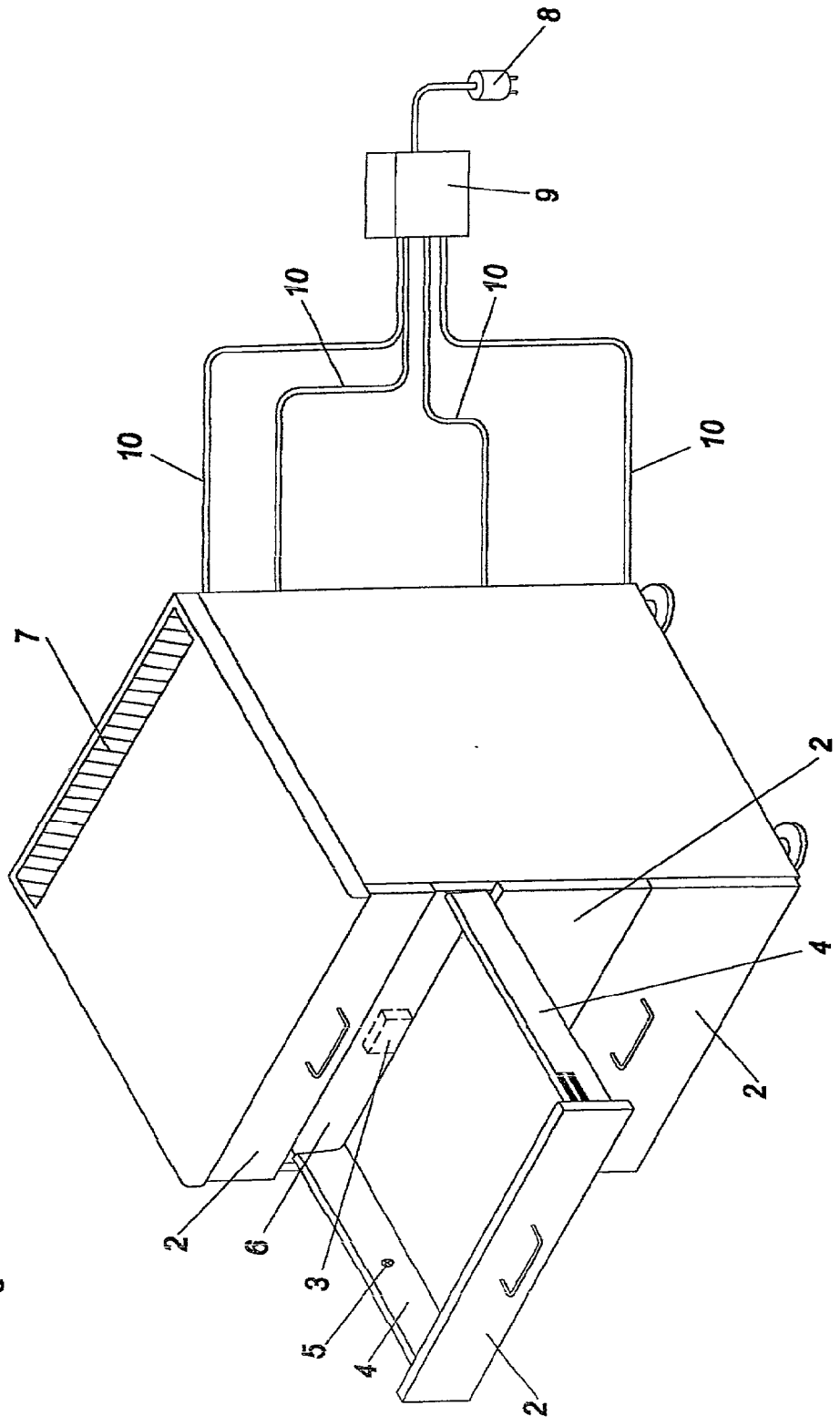


Fig. 1

Fig. 2a

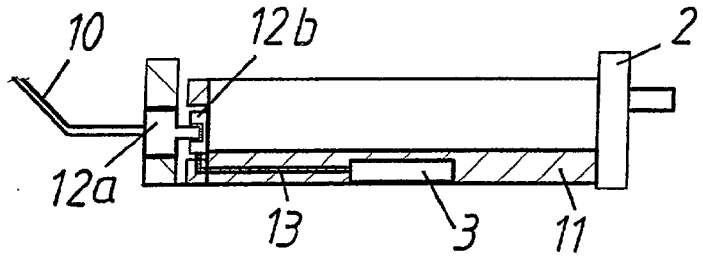


Fig. 2b

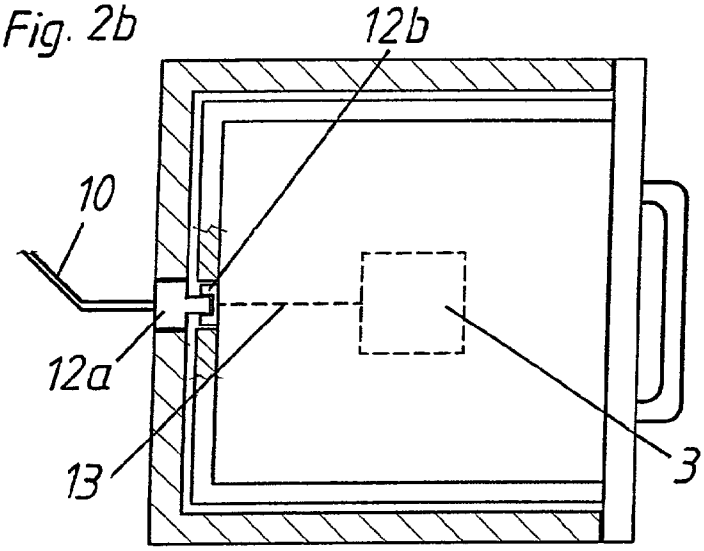


Fig. 2c

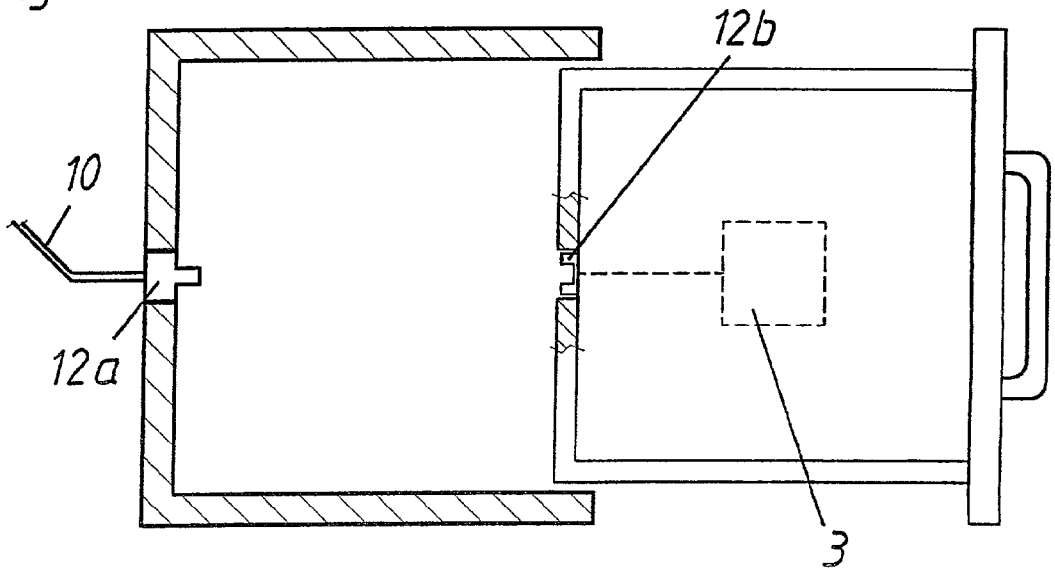


Fig. 3a

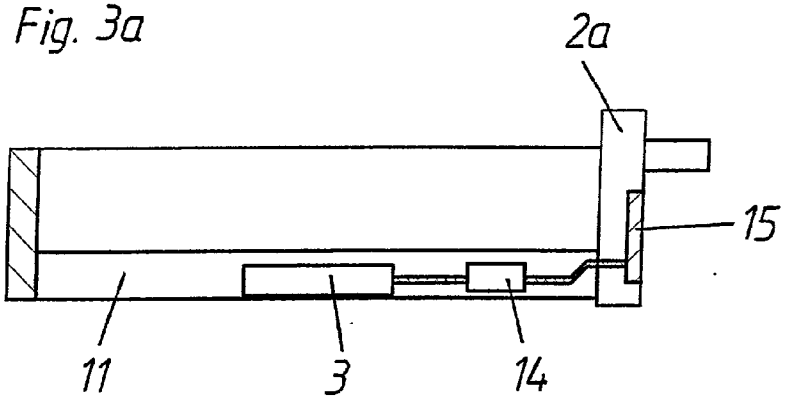


Fig. 3b

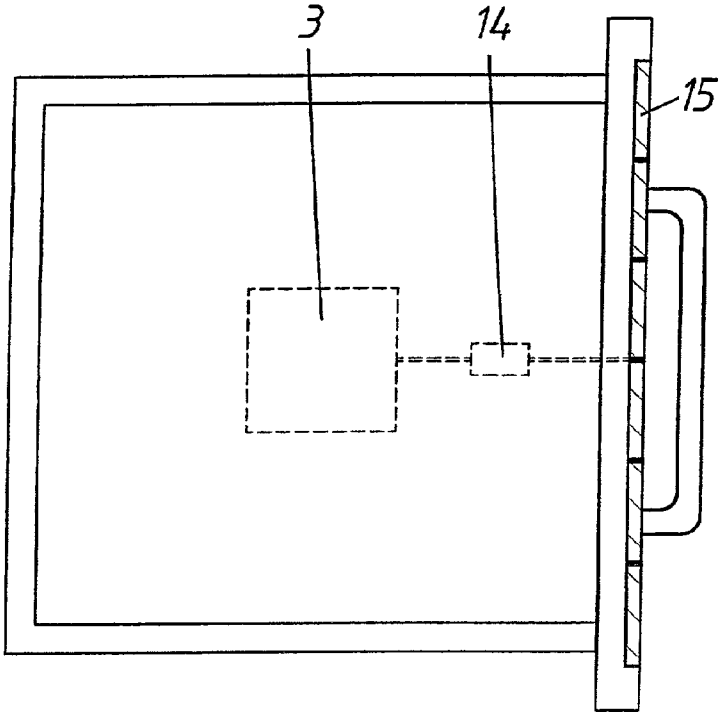
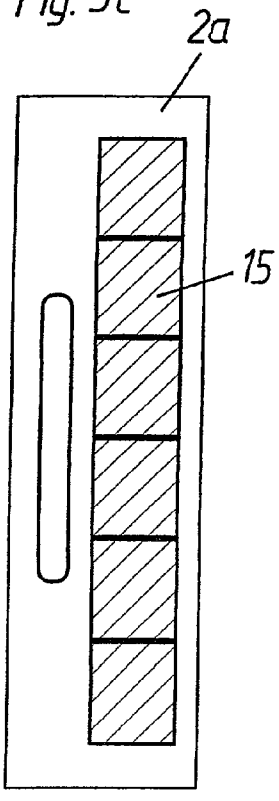


Fig. 3c



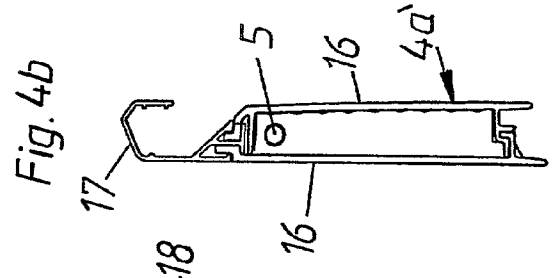


Fig. 4b

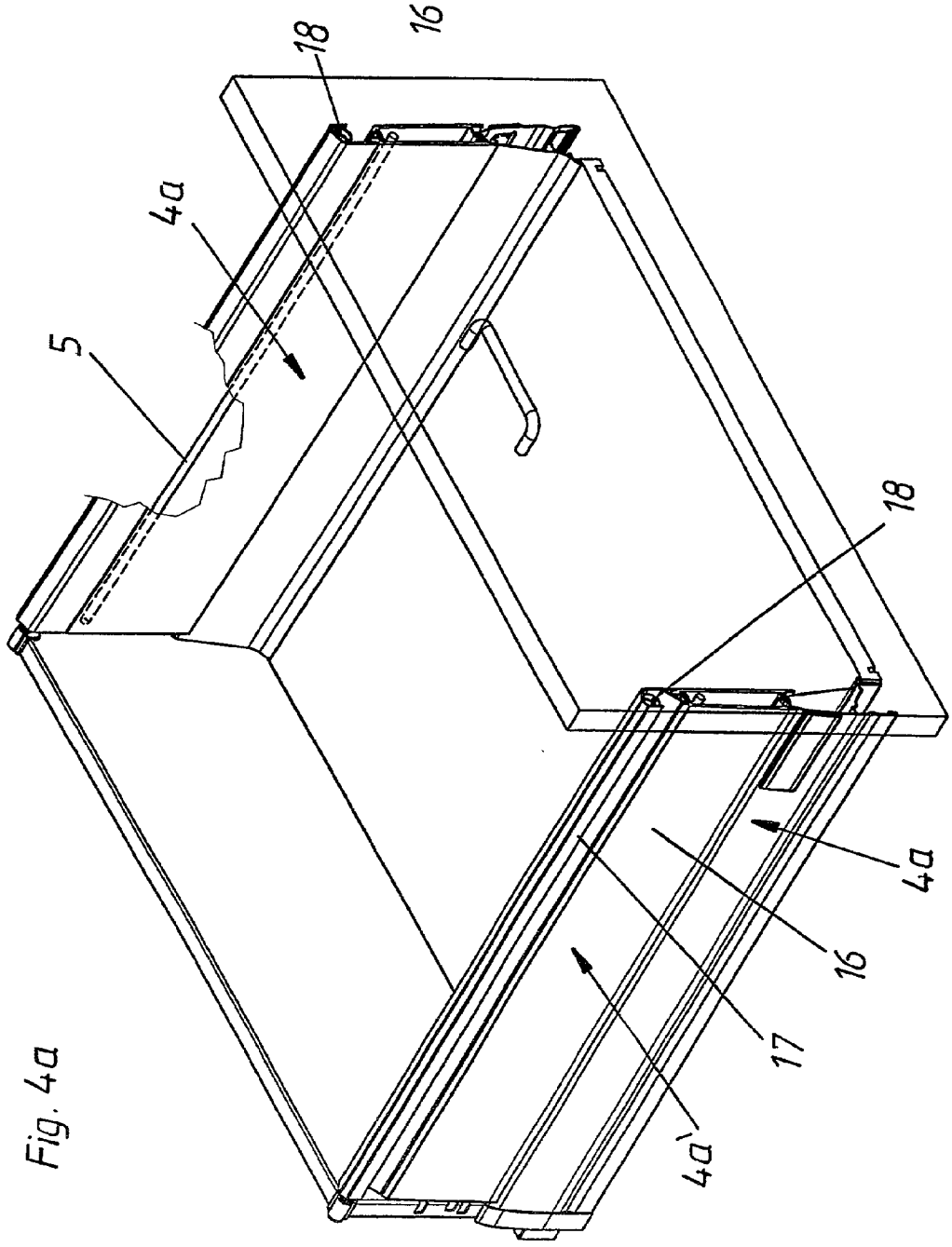


Fig. 4a

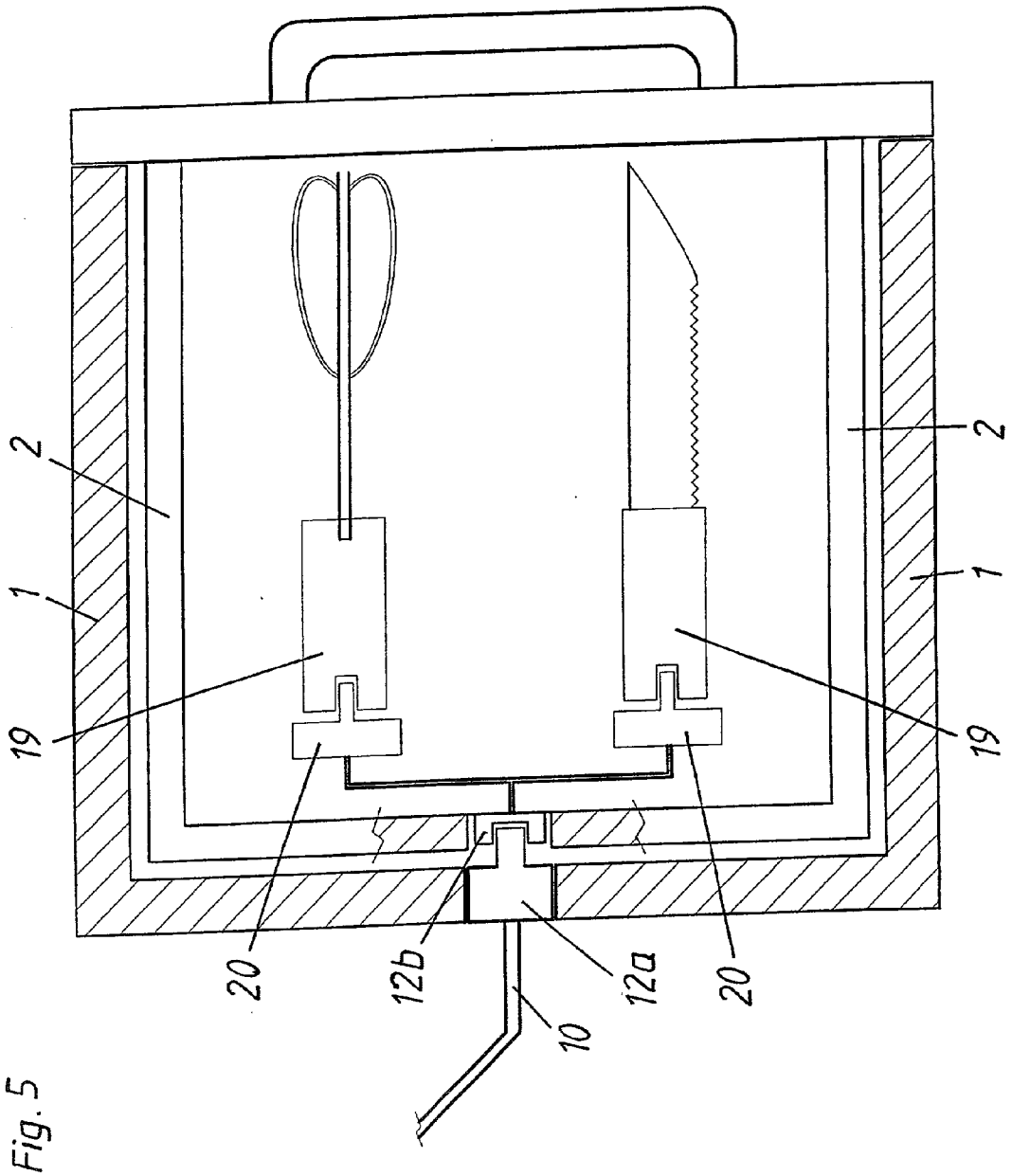


Fig. 5

Fig. 6a

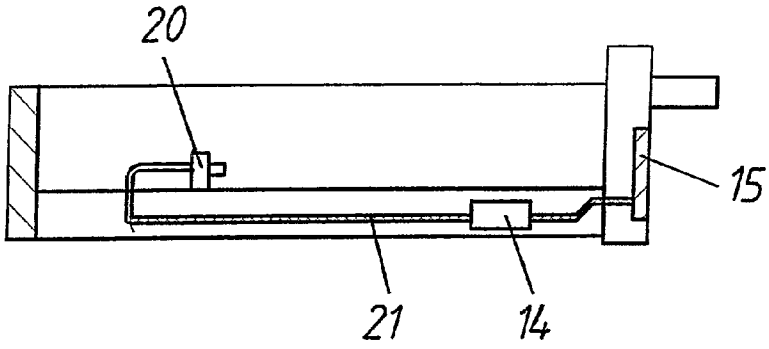


Fig. 6b

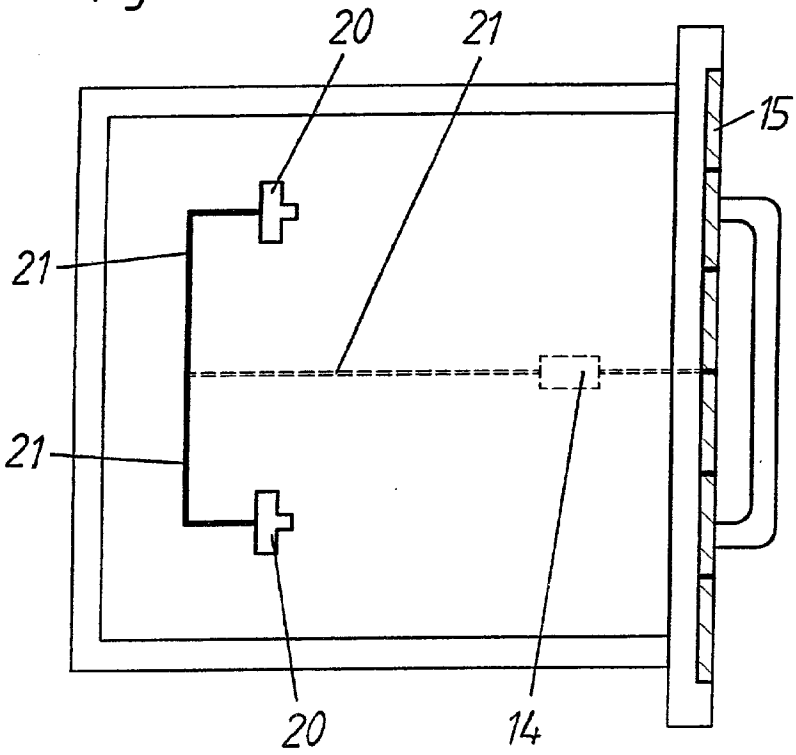


Fig. 6c

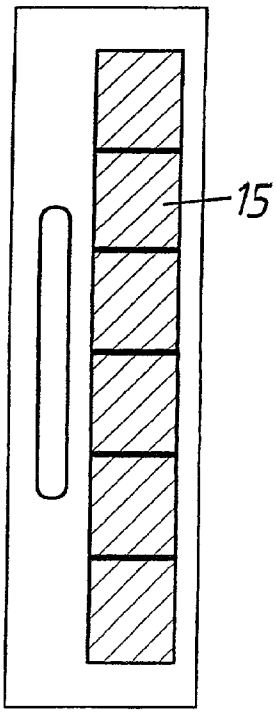


Fig. 7

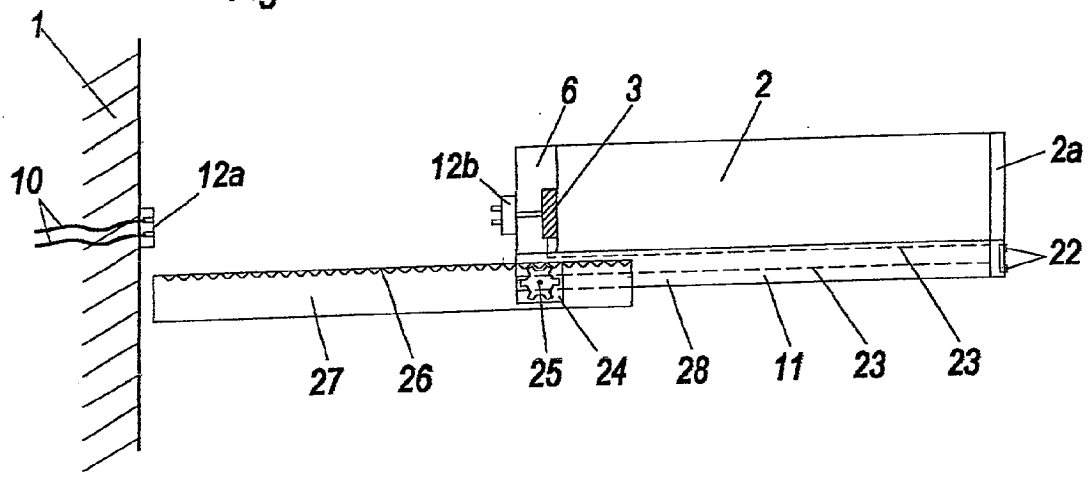

1
10
12a
12b
6
3
2
2a
22
27
26
25
24
28
11
23
23

Fig. 8

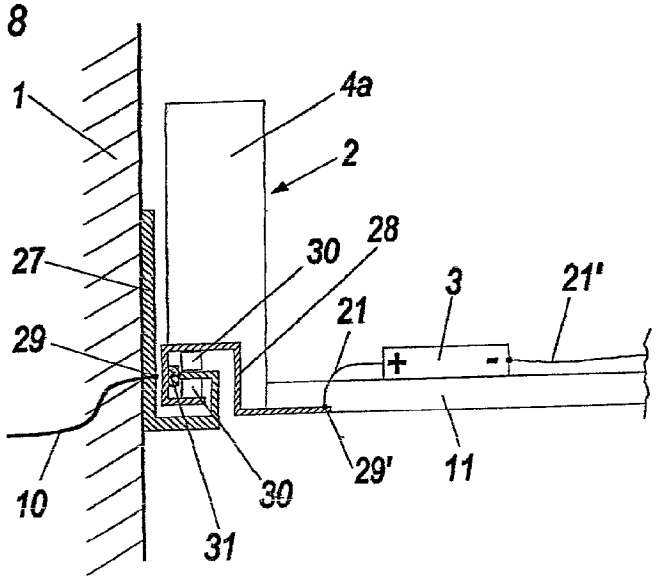

1
4a
2
27
30
28
3
21'
21
29
10
30
29'
11
31
+
-

Fig. 9a

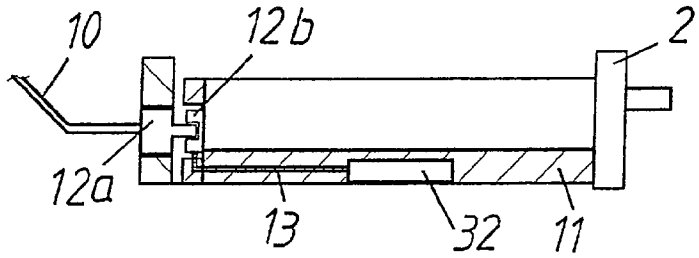


Fig. 9b

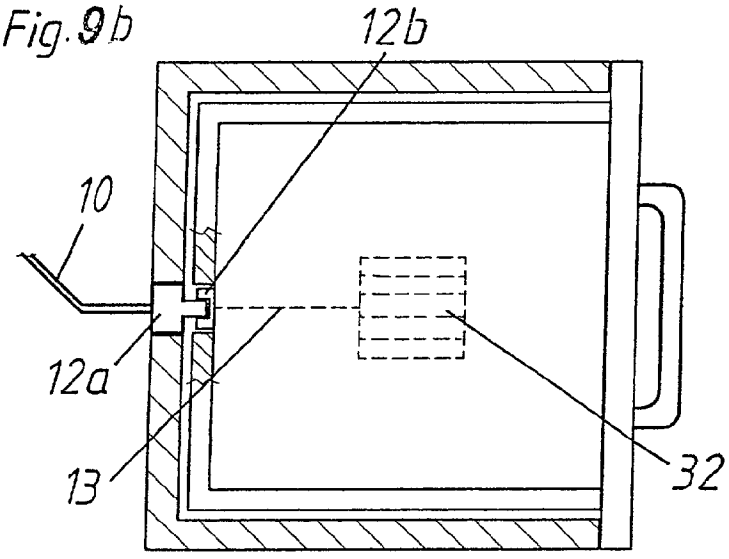
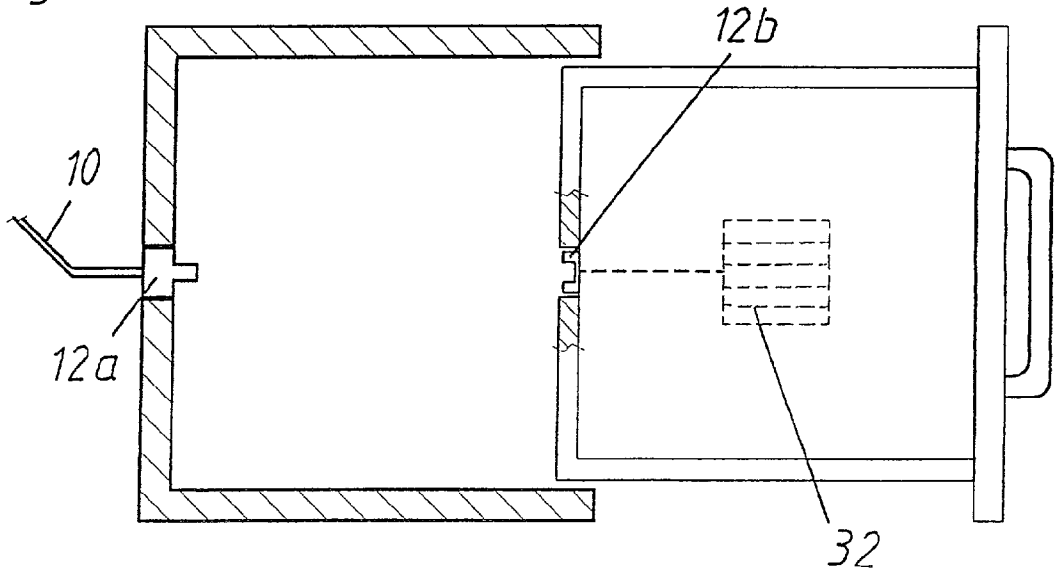


Fig. 9c



FURNITURE DRAWER

[0001] The invention relates to a furniture drawer that can be mounted, in a manner such that it can be pulled out, in a furniture carcass, and a piece of furniture with at least one furniture drawer that can be pulled out.

[0002] In order to avoid having permanent leads in the form of electric cables from the furniture carcass to the drawer, a furniture drawer is provided that is characterised by a device for transmitting electrical energy to at least one chargeable current storage means arranged in, or respectively on, the drawer.

[0003] By means of such chargeable current storage means it is possible to provide an autonomous energy supply for the drawer and respectively the electrical appliances located therein, preferably domestic appliances, wherein preferably transmission of electrical energy for charging the chargeable current storage means takes place only when the drawer is closed. When the drawer is pulled out, the charged current storage means can then supply electrical consumers such as lamps or drive motors, or respectively, domestic appliances located in the drawer, which are charged when the drawer is closed, can be removed.

[0004] In order to produce such a device for transmitting electrical energy, there is preferably provided on the rear wall of the drawer a contact-free transmitter, preferably an inductive coupler or a plug-in contact that, when the drawer is closed, automatically comes into contact with a carcass-side contact. The current supply is, for example, from the normal alternating current mains via a transformer that, in the area of the drawer, produces a low voltage range preferably below 25 volts, which is harmless to people.

[0005] The inductive electrical transmitters described are known per se, for example, in electric toothbrushes, and thus do not need to be described in more detail.

[0006] The chargeable current storage means can be built in or integrated into wall of the drawer or respectively in the base of the drawer, in a space-saving manner.

[0007] It is also possible, however, to use the normally metallic guide rails for transmitting current in the drawer, wherein advantageously sliding contacts are provided in order to connect the carcass-side guide rail, which is connected to a current source, to the drawer-side guide rail.

[0008] When using such electrical guide rails, cables can be avoided. As in this case a permanent current supply is possible in the drawer, in any position, with this variation of the invention a re-chargeable current storage means is basically unnecessary.

[0009] Electrical consumers, such as lamps or motors can instead continuously be supplied directly. Naturally, household appliances in the inside of the drawer that have a battery can also be charged via such electrified guide rails.

[0010] A particularly advantageous embodiment of the invention is provided in that at least one light source is configured as a light diode (LED). Light diodes combine a compact design with a good light yield, with a low energy requirement.

[0011] In addition to supply from the normal mains current, according to a further variation of the invention a solar cell is provided on the drawer or respectively on the furniture carcass. Using this, a current supply for electric consumers in or respectively on the drawer, that is inexpensive and above all without the necessity of connection to the mains, is possible, wherein a re-chargeable current storage means is provided that is charged by means of the solar cell and an appropriate charge regulator.

[0012] A particularly advantageous embodiment of the invention is provided in that at least one current storage means is a chargeable battery. Such chargeable batteries are obtainable in many different embodiments, so depending on the prospective need for current and the available space, a suitable chargeable battery can be selected.

[0013] A further advantageous embodiment of the invention is provided in that at least one chargeable current storage means is a capacitor. Even after prolonged use, with a capacitor there is virtually no detectable reduction in the storage capacity, as, for example, in contrast to accumulators, no memory effects that reduce the storage capacity occur.

[0014] Further advantages and details of the invention will be described in more detail with reference to the following description of the drawings.

[0015] **FIG. 1** shows a furniture carcass with drawers configured according to the invention in one embodiment,

[0016] **FIGS. 2***a*, **2***b* and **2***c* show an embodiment of a furniture drawer according to the invention in a schematic vertical section, a horizontal plan view with the furniture drawer pushed in, and a horizontal plan view with the furniture drawer pulled out,

[0017] **FIGS. 3***a*, **3***b* and **3***c* show a further embodiment with a solar cell supply in a schematic vertical section, a plan view and a front view of the front panel,

[0018] **FIGS. 4***a* and **4***b* show a further embodiment of a furniture drawer according to the invention with integrated lighting, wherein **FIG. 4***b* shows a cross-section through the panel frame according to **FIG. 4***a*,

[0019] **FIG. 5** shows an embodiment of a furniture drawer according to the invention with household appliances stored therein that have a re-chargeable battery,

[0020] **FIGS. 6***a*, **6***b* and **6***c* show a further embodiment of a furniture drawer according to the invention with solar cell and holders for receiving re-chargeable household appliances in vertical longitudinal section, a plan view and a view of the front panel,

[0021] **FIG. 7** shows an embodiment of a furniture drawer according to the invention with an electrical drive motor,

[0022] **FIG. 8** shows an embodiment of a furniture drawer according to the invention in a partial cross-sectional representation, in which the electrical supply is via the guide rail, and

[0023] **FIGS. 9***a*, **9***b* and **9***c* show an embodiment of a furniture drawer according to the invention in a schematic vertical section, a horizontal plan view with the furniture drawer pushed in, and a horizontal plan view with the furniture drawer pulled out.

[0024] The furniture carcass **1** shown in **FIG. 1** is provided with four drawers **2** that can be pulled out, which are respectively provided with a rechargeable accumulator

(rechargeable battery) in the rear wall. In the side wall of the drawer (drawer frame **4**) there is provided lighting **5** (in practice, for example, an elongate lighting tube), shown schematically, that lights the interior of the drawer via a transparent section. The current supply for this lamp **5** is from the re-chargeable battery **3** that, as already described, is integrated in the rear wall of the drawer **6**. In order to charge this rechargeable battery **3**, there is provided a device, described in more detail hereinafter, for transmitting electrical energy when the drawer is closed. This energy can, for example, be from solar cells **7** on the top of the furniture carcass or by means of a plug **8**, a transformer **9** and leads **10** from the normal mains supply.

[**0025**] The leads in the interior of the furniture carcass and between the re-chargeable battery and the lamp **5** are not shown in more detail. They can be laid in a space-saving and preferably invisible manner. Switches that switch on the lighting only when the drawer is pulled out are also not shown in more detail. They can be, for example, fitted onto the rear wall of the drawer, and switch on the lighting in a manner similar to opening a refrigerator. Supply via the solar cell **7** or respectively the public mains supply can be alternative or simultaneous, wherein an electronic system not shown in more detail, draws from the public mains supply where there is an absence of light for the solar cell. In this way, energy can be saved. With low energy use, however, the solar cell alone can be sufficient.

[**0026**] In the embodiment shown in **FIGS. 2***a*, **2***b* and **2***c*, the re-chargeable battery **3** is integrated into the base of the drawer **11**. The device for transmitting electrical energy is in this case composed of a two-part inductive coupler **12***a*, **12***b* that allows transmission of electrical energy when the drawer is closed, and thereby can charge the accumulator via the lead **13**. The external current supply is via the lead **10**, for example, from the public mains supply via a transformer or by a solar cell. The inductive coupler itself allows contact-free electrical transmission and is, as already described, already known, for example, in electric toothbrushes. It is also absolutely hardwearing where there is frequent opening and closing of the drawer. When the drawer is pulled out, as in **FIG. 2**, the drawer is separated from the lead **10**. Current supply to consumers, not shown here, for example, lamps, drive motors, or the like, is then via the charged accumulator **3**.

[**0027**] In the embodiment shown in **FIGS. 3***a*, **3***b* and **3***c*, again in the base **11** of the drawer there is provided an accumulator **3** that can be charged via a charge regulator **14** by a solar cell **15** on the front panel **2***a* of the drawer.

[**0028**] In the embodiment shown in **FIGS. 4***a* and **4***b*, an elongate lighting tube **5** is built into the panel frame **4***a*', the walls **16** of the panel frame can be configured transparent, at least in the interior of the drawer, in order to be able to light the interior of the drawer. The walls **16** are profiled and fit together by means of their profiled sections, wherein in the upper area a holding piece, for example of aluminium, is provided, that can be secured to a normal drawer rail **18**. The whole panel frame **4***a*' can be placed on the actual drawer frame **4***a*, and is held at the top by the rail **18**.

[**0029**] In the embodiment of **FIGS. 4***a* and **4***b*, for reasons of simplicity, electrical leads, the rechargeable current storage means, and any switches, are not shown. Alternatively, however, a continuous supply of current can be via the guide rails, as will be described later with reference to **FIG. 8**.

[**0030**] In the embodiment shown in **FIG. 5**, the re-chargeable current storage is arranged in the form of batteries in household appliances **19**, which can be accommodated in the drawer **2**. The charging of these re-chargeable batteries in the household appliances is done when the drawer is closed via the inductive coupler **12***a*, **12***b* and the holders **20**, which can either be plug-in contacts or again inductive couplers. When the drawer is pulled out, the household appliances **19** can then be easily removed.

[**0031**] **FIGS. 6***a*, **6***b* and **6***c* show an alternative current supply for the holder **20**, namely via a solar panel **15**, a charge regulator **14** and leads **21** to the holders **20**. In thee drawings, the household appliances have just been removed.

[**0032**] **FIG. 7** shows an embodiment wherein the device for transmitting the electrical energy from the furniture carcass **1** to the drawer **2** is via a mechanical plug-in contact **12***a*', **12***b*' that automatically forms an electrical contact when the drawer is closed. In the rear wall of the piece of furniture **6** a re-chargeable current storage means in the form of a chargeable battery **3** is again integrated, which supplies an electrical drive motor **24** via a switch **22** and leads **23** in the base **11** of the drawer. Said motor carries a pinion **25** that engages with a toothed rod **26** on the carcass-side rails, and therefore makes possible driving of the drawer. The normal running rollers, or respectively glides, between the carcass-side guide rail **27** and the storage-side guide rail **28** are not shown for reasons of simplicity. They correspond to the current industry standard. In the embodiment shown in **FIG. 7**, there is thus produced an autonomous, drivable, self-driven drawer, without annoying moving cables for supplying current to the drive motor **24**.

[**0033**] In the embodiment shown in **FIG. 8**, the guide rail **27** fixed carcass-side is electrically contacted to the point **29** with the supply lead **10** (plus pole). The base **11** and side wall **4***a* of one side of the drawer **2** is shown. Connected to the drawer is the drawer-side guide rail **28** that can be pulled out with respect to the cupboard rail **27** by means of very schematically shown rollers, rolling bearings or glide bearings **30**. In order to now continuously produce an electrical contact between the contacting, carcass-side guide rail **27**, and the drawer-side guide rail **28**, a sliding contact **31** is provided that, in any pulled-out position, in particular also when the drawer is closed, provides a contact with the interior of the drawer. By means of the contact point **29**' and the cable **21**, the re-chargeable battery **3** can be charged. This can naturally also be integrated into the base of the drawer **11** in a space-saving manner. The other pole is continuously contacted via the lead **21**' via the analogous right-hand system, not shown here, to guide rails. With such a system, naturally the re-chargeable current storage means can also be omitted, as in this way it is possible to guarantee an electrical supply for the drawer, or respectively the consumers fitted therein or thereon, in any pulled-out position.

[**0034**] The embodiment shown in **FIGS. 9***a*, **9***b* and **9***c* differs from that shown in **FIGS. 2***a*, **2***b* and **2***c* in that instead of a re-chargeable battery **3**, an arrangement of five capacitors **32**, preferably connected in parallel, is integrated into the base **11** of the drawer. Commercially obtainable capacitors, with typical sizes in the centimeter-range, and each with a capacity in the order of 50-500 μF can be used, for example. These are sufficient to operate, for example, light sources, over a typical duration of opening of drawers.

1. Furniture drawer that can be mounted, in a manner such that it can be pulled out, characterized by a device for transmitting electrical energy to at least one chargeable current storage means arranged in or on the drawer.

2. Furniture drawer according to claim 1, characterized in that at least one chargeable current storage means is a chargeable battery.

3. Furniture drawer according to claim 1, characterized in that at least one chargeable current storage means is a capacitor.

4. Furniture drawer according to claim 1, characterized in that the device for transmitting electrical energy avoiding an electrical cable between the furniture carcass and furniture drawer is configured such that an electrical transmission to the chargeable current storage means arranged in or on the drawer is done when the drawer is closed.

5. Furniture drawer according to claim 4, characterized in that the device for transmitting electrical energy is provided with at least one contact-free transmitter arranged on the rear wall of the drawer.

6. Furniture drawer according to claim 5, wherein the contact-free transmitter is an inductive coupler or a plug-in contact.

7. Furniture drawer according to claim 6, characterized in that the chargeable current storage means is built into a wall of the drawer or base of the drawer.

8. Furniture drawer that is mounted in a furniture carcass such that it can be pulled out, characterized by at least one holder arranged in or on the drawer, for an appliance provided with a chargeable battery, the chargeable battery of which is chargeable by means of the holder, wherein the device for transmitting electrical energy avoiding an electrical cable between the furniture carcass and furniture drawer is configured such that electrical transmission to the chargeable current storage means arranged in or on the drawer takes place only when the drawer is closed, in that the device for transmitting electrical energy is provided with at least one contact-free transmitter.

9. Furniture drawer according to claim 1, characterized in that at least one electrical consumer is fixed therein or respectively thereon.

10. Furniture drawer according to claim 9, wherein the electrical consumer is a light source or a drive motor for the furniture drawer.

11. Furniture drawer according to claim 10, characterized in that the light source is arranged in or on the wall of the drawer configured transparent in sections.

12. Furniture drawer according to claim 11, characterized in that at least one light source is a low voltage lightning tube.

13. Furniture drawer according to claim 11, characterized in that at least one light source is a light emitting diode (LED).

14. Furniture drawer according to claim 1, characterized in that there is provided, on the front a panel, at least one solar cell for supplying consumers, or the chargeable current storage means, arranged in or on the drawer.

15. Piece of furniture with at least one furniture drawer that can be pulled out, characterized in that on the furniture carcass there is arranged at least one solar cell for supplying consumers, or chargeable current storage means arranged in or on the drawer.

* * * * *