



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**01.06.2022 Bulletin 2022/22**

(51) International Patent Classification (IPC):  
**G07G 1/00 (2006.01) G07F 19/00 (2006.01)**  
**E05G 5/00 (2006.01) G07D 11/125 (2019.01)**

(21) Application number: **22163498.3**

(22) Date of filing: **22.03.2022**

(84) Designated Contracting States:  
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR**  
 Designated Extension States:  
**BA ME**  
 Designated Validation States:  
**KH MA MD TN**

(71) Applicant: **M.I.B. S.r.L.**  
**20121 Milan (IT)**

(72) Inventor: **FUMANELLI, Mr. Giuseppe Ezio**  
**I-20066 MELZO (Milan) (IT)**

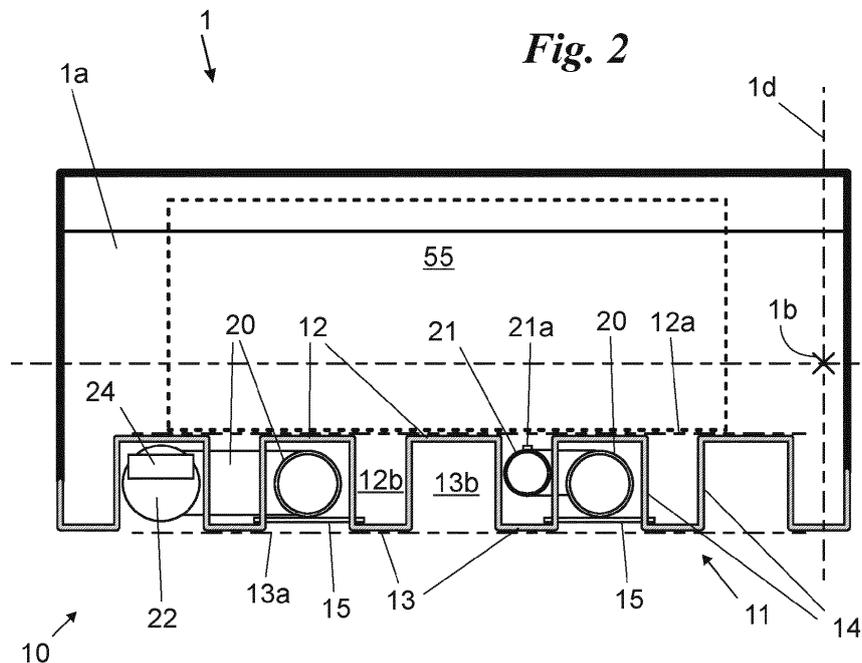
(74) Representative: **Lunati & Mazzoni S.r.L.**  
**Via Carlo Pisacane, 36**  
**20129 Milano (IT)**

(30) Priority: **18.01.2022 IT 202200000668**

(54) **BANKNOTE DRAWER FOR ATM, MULTIFUNCTIONAL OR BANCOMAT**

(57) It is provided a banknote drawer (1) for banknotes (55) for Bancomat, ATM and similar (50), the banknote drawer (1) comprising perimeter walls defining an internal volume (1a) and comprising at least one equipped wall (10), adjoining the external environment said internal volume (1a), the equipped wall (10) comprising: a contoured plate (11) defining: a plurality of ridges (12), proximate to the interior of the banknote drawer (1), a plurality of valleys (13), proximate to the exterior of the banknote drawer (1), transverse walls (14) suitable to connect the ridges (12) and the valleys (13), inner vol-

umes (12b) each confined by a valley (13) and at least one transverse wall (14), outer volumes (13b) each confined by a ridge (12) and at least one transverse wall (14), the banknote drawer (1) comprising: a container (20) for marking fluid arranged, for at least 80% of its volume, in at least one of said volumes (12b, 13b), an ejection system (21) comprising nozzles (21a) for projecting the marking fluid onto said banknotes (55) and arranged in at least one of said volumes (12b, 13b), for at least 80% of its volume.



## Description

**[0001]** The present invention relates to a banknote drawer, in particular a drawer for Bancomat, ATM, and similar of the type specified in the preamble to the first claim. Various types of banknote or cash drawers are currently known, such as drawers for, ATM, Bancomat, multifunction or similar containers for transporting banknotes and even more.

**[0002]** These drawers are particularly vulnerable to theft and break-ins, especially in the case of Bancomat, ATM drawers and similar containers.

**[0003]** To remedy these problems, active marking systems have been developed to invalidate the banknotes contained in the drawers, which include break-in sensors that, in the event of an alarm, activate means of marking the banknotes and values contained in the drawers with indelible ink, so as to render them unusable.

**[0004]** For example, similar marking means are described in the Italian patent IT MI2001A000946, and in the US patent application US 2003/0005882 A1 of the same applicant.

**[0005]** Such active marking systems are very effective. However, in the case of break-ins using explosives, these create significant shock waves, and in many cases the banknotes in the drawers can be ejected or separated from the marking system during the explosion, rendering the marking system ineffective. Indeed, the conveyance of the ink to the drawer and its projection onto the banknotes may be less rapid than the explosion itself. Patent application DE202018105701U1, filed in 2018, seeks to remedy the aforementioned inconvenience by making a drawer that includes a yielding reservoir with a marking ink inside, placed in the vicinity of the banknotes.

**[0006]** This reservoir breaks in the event of a burst, automatically marking the banknotes and values in the drawers and making them unusable.

**[0007]** A similar solution was already implemented in many drawers and containers, and was for example described in patent documents: EP1653037A1, published in 2006, GB1138104A, published in 1968, and US5156272A, published in 1992.

**[0008]** These devices, while improving the situation, do not completely solve the technical problem.

**[0009]** In fact, the described collapsible ink reservoir on top of the banknotes is not always broken by the explosion, particularly when a limited amount of explosive or low explosive potential is used.

**[0010]** At other times, the reservoir breaks in places where the banknotes are not present.

**[0011]** In this situation, the technical task underlying the present invention is to devise a banknote drawer capable of substantially obviating at least some of the aforementioned drawbacks.

**[0012]** In the context of said technical task, it is an important aim of the invention to realise a banknote drawer which is simple and inexpensive.

**[0013]** A further technical task is to realize a banknote

drawer, which is suitable for marking banknotes and values even when explosive substances of solid, gaseous, slow or fast type, or in combination or sequence, are used.

5 **[0014]** The technical task and the specified purposes are achieved by a banknote drawer as claimed in the appended claim 1.

**[0015]** Preferred technical solutions are highlighted in the dependent claims.

10 **[0016]** The features and advantages of the invention are hereinafter clarified by the detailed description of preferred embodiments of the invention, with reference to the appended drawings, wherein:

15 the **Fig. 1** schematises a view from the outside of a Bancomat, ATM and similar;

the **Fig. 2** schematises a front view of the interior of a banknote drawer according to the invention,

20 the **Fig. 3** schematises a bottom view of the interior of a banknote drawer according to the invention.

**[0017]** In the present document, the measurements, values, shapes and geometric references (such as perpendicularity and parallelism), when associated with words like "about" or other similar terms such as "approximately" or "substantially", are to be considered as except for measurement errors or inaccuracies due to production and/or manufacturing errors, and, above all, except for a slight divergence from the value, measurements, shape, or geometric reference with which it is associated. For instance, these terms, if associated with a value, preferably indicate a divergence of not more than 10% of the value.

25 **[0018]** Moreover, when used, terms such as "first", "second", "higher", "lower", "main" and "secondary" do not necessarily identify an order, a priority of relationship or a relative position, but can simply be used to clearly distinguish between their different components.

30 **[0019]** The measurements and data reported in this text are to be considered, unless otherwise indicated, as performed in the International Standard Atmosphere ICAO (ISO 2533:1975).

**[0020]** With reference to the Figures, the banknote drawer according to the invention is globally referred to as number **1**.

35 **[0021]** The banknote drawer **1** preferably comprises a drawer for Bancomat, ATMs and similar **50**.

40 **[0022]** The banknote drawer **1** defines an internal volume **1a** for said banknotes **55** and values. The latter are preferably arranged in the central portion of the same internal volume **1a** and occupy, in normal section, most of the internal volume **1a**. The banknotes **55** are preferably positioned aligned in a single row.

45 **[0023]** In particular, the banknote drawer **1** defines a longitudinal direction **1b**, in use perpendicular to the direction of the planes formed by the individual banknotes **55** (in Fig. 2 perpendicular to the page). The banknote drawer **1** further defines a lateral direction **1c**, perpen-

dicular to the longitudinal direction 1b and preferably coinciding with the direction of prevailing extension of the individual banknotes 55, and a transverse direction 1d, perpendicular to the longitudinal direction 1b and the lateral direction 1c. In use, within the Bancomat or ATM 50, the banknote drawer 1 is preferably arranged with any of the longitudinal direction 1b, lateral direction 1c, transverse direction 1d, parallel to the vertical direction. In particular, it may be arranged with the plane parallel to the longitudinal directions 1b and the lateral directions 1c horizontal or vertical, depending on the type of Bancomat or ATM 50.

**[0024]** The banknote drawer 1 comprises boundary walls, preferably substantially parallel to the longitudinal directions 1b, lateral directions 1c, transverse directions 1d. The term walls preferably means structured walls, and not simply panels or plates. For example walls rich in stiffening ribs.

**[0025]** They comprise at least one equipped wall 10, which preferably comprises a wall parallel to the longitudinal directions 1b, lateral directions 1c, thus one of the two walls with a larger surface area of the banknote drawer 1. Alternatively, it could comprise the two opposite walls parallel to the longitudinal directions 1b and lateral directions 1c or on still other walls. The equipped wall 10 borders, at least partially, the environment outside the banknote drawer 1 and preferably inside the safe.

**[0026]** Preferably, the equipped wall 10 is counterered, at least in part, and defines a structure which, in the plane parallel to the lateral directions 1c and transverse directions 1d, defines a crenelated profile which remains constant in the longitudinal direction 1b (Fig. 2). Said crenelated profile preferably comprises continuous folds, preferably at 90°, of the wall 10 itself. The wall 10 thus preferably defines a series of ridges 12, close to the inside of the drawer 1, and a series of valleys 13, close to the outside of the drawer 1 (Fig. 2). Said ridges 12 and said valleys 13 are in turn preferably joined by transverse walls 14, preferably substantially parallel to the longitudinal direction 1b and transverse direction 1d.

**[0027]** In any case, preferably, the virtual prolongation of the ridges 12 along the entire surface of the drawer 1 defines an inner surface 12a, preferably flat where the notes 55 rest. Furthermore, preferably, the virtual prolongation of the valleys 13 along the entire surface of the drawer 1, defines an external surface 13a, preferably flat.

**[0028]** Said inner surface 12a preferably faces the banknotes 55 and more preferably faces the banknotes 55, preferably supports and supports the banknotes 55 or borders them. The perimeter walls also preferably comprise a cover, preferably movable and hinged and opposite the equipped wall 10. The lid may also be an equipped wall.

**[0029]** Said wall 10, in the spaces formed between the ridges 12 and the valleys 13, and taking advantage of the transverse walls 14 forms inner volumes 12b, which are substantially confined by a valley 13 and one or two transverse walls 14.

**[0030]** Said wall 10, in the spaces formed between the ridges 12 and the valleys 13, and by exploiting the transverse walls 14 also forms outer volumes 13b, which are substantially confined by a ridge 12 and one or two transverse walls 14.

**[0031]** The banknote drawer 1 further preferably comprises at least one container 20 for marking fluid, fluid-tight and contained, at least in part and more preferably for at least 70% of its volume, in said volumes 12b, 13b, preferably in said outer volumes 13b.

**[0032]** It preferably comprises a tubular element, for example metallic or polymeric (elastomeric or other), having a circular or rectangular or other cross-section. It is also preferably extended in a plurality of volumes 12b, 13b, preferably in a plurality of outer volumes 13b. The container 20 preferably defines a single internal volume and thus also extends in a lateral direction 1c, through some transverse walls 14 which are suitably perforated or open to allow passage (Fig. 3). Finally, supports 15, such as rods or the like, are preferably provided to support the various elements along the missing wall of the volume 12b or 13b.

**[0033]** Said container 20 is connected, in fluid passage connection, to an expulsion system 21 which preferably comprises a pipeline provided with nozzles 21a facing the notes 55. The ejection system 21 is contained, at least in part and more preferably for at least 70% of its volume, more preferably still for the totality of its volume, in at least one volume 12b, 13b, preferably in an internal volume 12b. It is preferably connected to the container 20 by means of a suitably perforated transverse wall 14.

**[0034]** The banknote drawer 1 further preferably comprises a pressure container 22 of gas, in fluid passage communication with the container 20 and suitable for pressurizing the interior of the same container 20 so as to project the marking fluid onto the banknotes 55 through the ejection system 21. The pressure container 22 is preferably contained in a volume 12b or 13b, preferably in an external volume 13b.

**[0035]** Blocking valves 23, in particular diaphragm rupture valves, capable of retaining the ink in the container 20 when not under pressure, may also be present inside the container 20.

**[0036]** The banknote drawer further preferably comprises break-in sensors and control means 24, preferably arranged in close proximity to the pressurised container 22. The break-in sensors as known to them are preferably shock sensors, tilt sensors, gas sensors, tilt sensors, smoke sensors, GPS systems, accelerometers, temperature sensors or the like and are suitable for sensing break-in or attempted break-in.

**[0037]** The control means 24 preferably comprise electronic means and are preferably arranged in a volume 12b or 13b, preferably in an outer volume 13b.

**[0038]** In the event of an attempted break-in, the control means, by means of an activator assembly 22a arranged at the head of the pressure container 22, are capable of pressurising the container 20.

**[0039]** Finally, the drawer 1 may comprise locking means sensors, suitable for detecting whether or not the drawer 1 is positioned inside the safe in its rack, so that the systems can be activated or deactivated in the event of transport.

**[0040]** The operation of the banknote drawer 1 described above in structural terms is as follows.

**[0041]** The banknote dispenser 50 on which the banknote drawer 1 is installed is used in a known and traditional manner.

**[0042]** In the event of a break-in, the break-in sensors and control means 24 detect the attempt and the pressurised container 22 is opened or activated via the activation unit 22a. The container 20 is pressurised, possibly the valves 23 are opened due to said pressure. The marking fluid reaches the ejection system 21 and, via the nozzles 21a, the banknotes 55.

**[0043]** The banknote drawer 1, according to the invention achieves important advantages.

**[0044]** In fact, the particular position and size of the elements described allows its positioning close to the banknotes 55 and therefore a very rapid marking of the banknotes themselves.

**[0045]** The system described can also be implemented in existing drawers, without having to implement further structural modifications to the original drawer.

**[0046]** Furthermore, the implementation, use and maintenance of the same is simple and inexpensive.

**[0047]** The invention is susceptible to variations within the scope of the inventive concept as defined by the claims. Within this scope, all details are substitutable by equivalent elements and the materials, shapes and dimensions can be any.

## Claims

1. Banknote drawer (1) for banknotes (55) for Bancomat, ATM, multifunctional and similar (50),

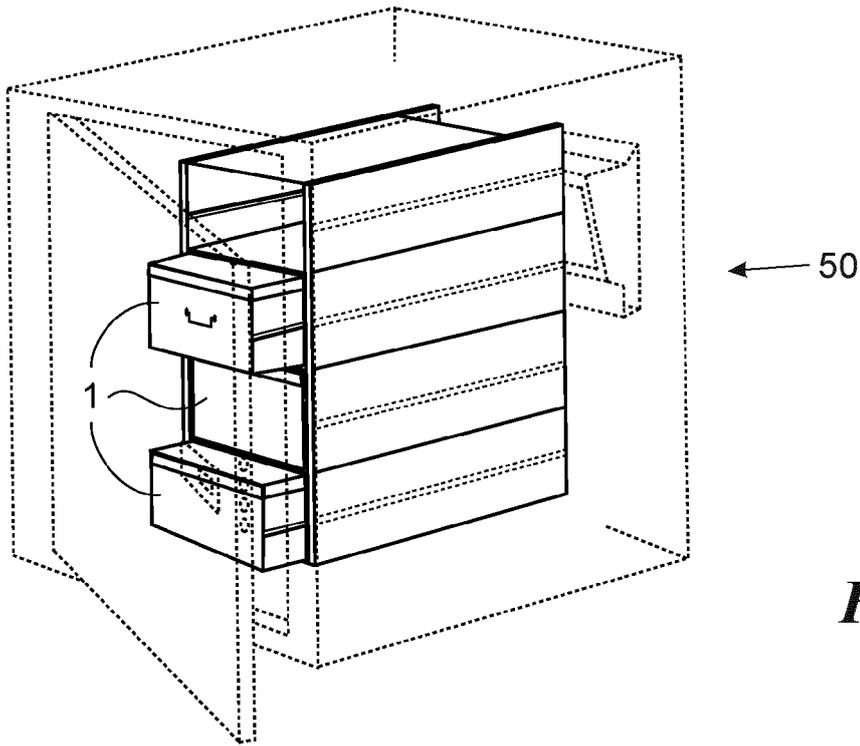
said banknote drawer (1) comprising perimeter walls defining an internal volume (1a) and including at least one equipped wall (10), bordering on the external environment with said internal volume (1a),

- said equipped wall (10) comprising:
- a plurality of ridges (12), proximate to the internal of said banknote drawer (1),
- a plurality of valleys (13), proximate to the external of said banknote drawer (1),
- transverse walls (14) connecting said ridges (12) and said valleys (13),
- inner volumes (12b) each confined by said valleys (13) and at least one said transverse wall (14),
- outer volumes (13b) each confined by said ridge (12) and at least one said transverse

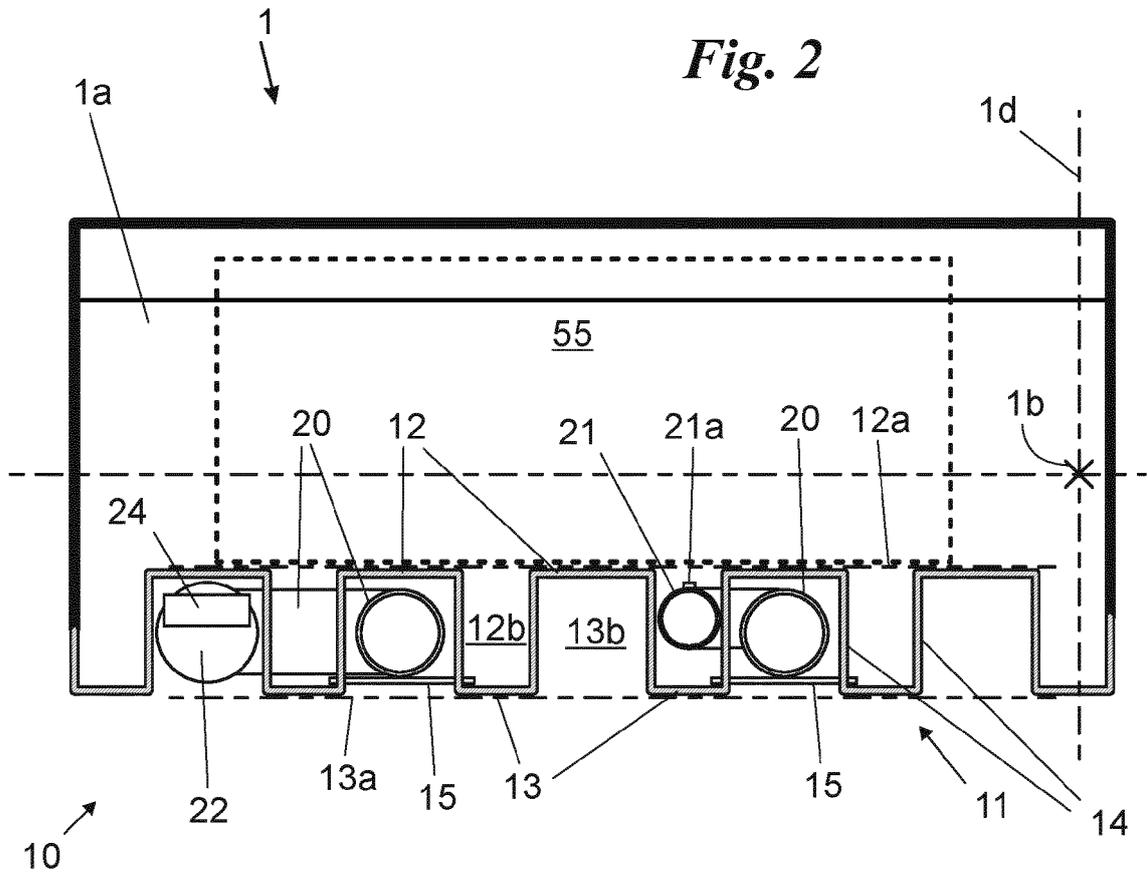
wall (14),

said banknote drawer (1) being **characterised by** comprising:

- 5
- a container (20) for marking fluid arranged, for at least 70% of its volume, in at least one of said volumes (12b, 13b),
- an ejection system (21) comprising nozzles (21a) capable of projecting said marking fluid onto said banknotes (55),
- said ejection system (21) being arranged in at least one of said volumes (12b, 13b) for at least 70 % of its volume.
- 10
2. Banknote drawer (1) according to any preceding claim, wherein said container (20) is arranged for at least 70% of its volume, in at least one of said outer volumes (13b).
- 15
3. Banknote drawer (1) according to any preceding claim, wherein said ejection system (21) is arranged for at least 70% of its volume, in at least one of said inner volumes (12b).
- 20
4. Banknote drawer (1) according to any preceding claim, comprising a gas pressure container (22), in fluid passage communication with said container (20) and disposed in at least one of said volumes (12b, 13b),
- 25
5. Banknote drawer (1) according to any preceding claim, wherein said pressure container (22) is disposed in one of said outer volumes (13b).
- 30
6. Banknote drawer (1) according to the preceding claim, comprising burglary sensors and control means (24) for sensing the burglary or attempted burglary and opening said pressure container (22).
- 35
7. Banknote drawer (1) according to the preceding claim, wherein said burglary sensors and control means (24) are arranged in one of said outer volumes (13b).
- 40
8. Banknote drawer (1) according to any preceding claim, wherein said container (20) comprises at least one blocking valve (23), in particular diaphragm rupture valves, suitable for retaining ink in the container (20) when not under pressure.
- 45
9. Banknote drawer (1) according to any preceding claim, comprising locking means suitable for detecting whether or not said banknote drawer (1) is positioned inside said safe within its rack.
- 50
10. Bancomat, ATM or similar, comprising at least one banknote drawer (1) according to any preceding claim.
- 55

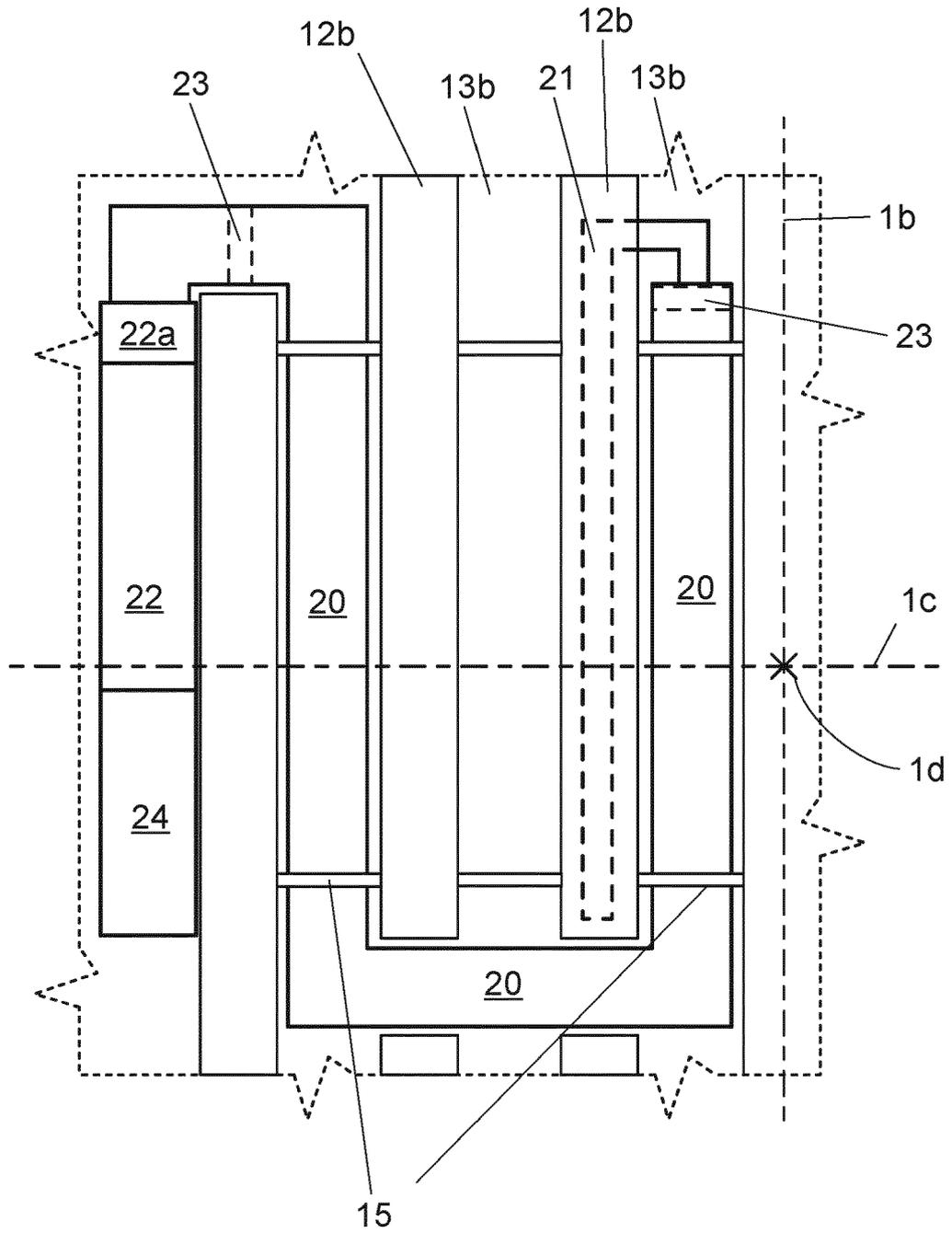


*Fig. 1*



*Fig. 2*

*Fig. 3*



**REFERENCES CITED IN THE DESCRIPTION**

*This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.*

**Patent documents cited in the description**

- IT MI20010946 A [0004]
- US 20030005882 A1 [0004]
- DE 202018105701 U1 [0005]
- EP 1653037 A1 [0007]
- GB 1138104 A [0007]
- US 5156272 A [0007]