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(54) **SELF-SUPPORTING CONSTRUCTION OF FORWARD OPENING DOOR FOR COVERING OF OPENINGS IN A WALL**

SELBSTTRAGENDE KONSTRUKTION EINER NACH VORNE ÖFFNENDEN TÜR ZUR ABDECKUNG VON ÖFFNUNGEN IN EINER WAND

CONSTRUCTION AUTOPORTANTE DE PORTE D'OUVERTURE AVANT DESTINÉE À RECOUVRIR DES OUVERTURES DANS UNE PAROI

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EP 3 258 051 B1

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Description

Technical field

[0001] The invention relates to a forward opening door for covering of openings in a wall, especially for openings covered with tiled surfaces, which are provided for the revision and for access to piping, water meters, and to other technical networks, where the door is also provided with tiles and in a closed state it coincides with tiles of surrounding wall.

Background art

[0002] In each building or in each residential unit there is at least one access point for revision and checking of technical networks. Checking opening is almost always in toilets or in bathrooms, where it is possible to close the faucet for water distribution to the flat, so that it is not necessary to close the water supply completely in the house during repairs etc. The neighbour surfaces are often covered with tiles and therefore it is necessary to ensure, that the doors of checking openings are also covered with tiles, which coincide with surrounding aesthetic relief and which does not spoil the aesthetic impression of the overall wall tiling.

[0003] The document CZ 8335 U1 discloses a door for covering of the wall opening, where on a support wall, which is generally of plasterboard, a strip with hinges is placed from inside, and on these hinges the door provided with tiles is hinged.

[0004] The problem of the accurate fitting of the tiles on the walls and on doors is solved by so called forward opening door, for instance according to the document CZ 10050 U1. The solution is that the door hinge is not fastened to the frame on the wall but on the edge of the swinging arm, whose second edge is hinged in a hinge arranged at the rear face of the wall at a certain distance from the opening.

[0005] From the document CZ 305131 B1 a door is known which has a control arm provided with a recess, whereas in the space of the recess an angle bracket with one of its arm is mounted on the wall, on the opposite side of the door, and on its second arm, which is perpendicular to inner face of the wall, a push lock is mounted with a push protrusion which is oriented to the door, when it is closed. This solves hidden opening, however the control arm has to be massive with large gripping surfaces on the door baseplate with tiles. First, the board has to be mounted and then the tiles are placed on it, which is difficult, because steel arms are already mounted on the board.

[0006] In DE 198 37 379 A1 a self-supporting construction of forward opening door for covering of openings in a cabinet, where a pivotal swinging upper and lower arm (7, 8) are arranged between the wall and the door made as a frame which has a shape of a frame window

[0007] In FR2625526A1,

[0008] US3,186,027, DE 20 2005 014 379 U1 or DE 8909731 U1 there are various variants of hinges for doors in cabinets, the hinges enable forward opening of the doors wherein this doors can be totally opened in the range of 180 °. But such hinges are not hidden which is important to keep the doors hidden before unauthorized people.

[0009] The aim of this invention is to introduce a forward opening door for covering of openings in the wall of the above mentioned type, but which would have a lightweight construction, which would enable simplified, versatile and effective filling of the door space from the front and which would allow the door to be easily seated in the wall.

Summary of the invention

[0010] The above mentioned deficiencies are eliminated by the forward opening self-supporting construction of forward opening door for covering of openings in the wall according to the invention, with feature defined in the characterizing part of the claim 1.

Brief description of drawings

[0011] The invention will be further described using drawings, where Fig.1 is a perspective view of the door according to the invention without covering plate with tiles, Fig. 2 is a perspective view of the door from a different view, Fig. 3 is a schematic cross-section of the door, Fig. 4 is a detail of the support base, Fig. 5 shows a support strip, provided as a support element for a covering strip, Fig. 6 shows the upper arm in perspective view, Fig. 7 shows a side view of the upper arm, Fig. 8 shows the lower arm in perspective view, Fig. 9 shows the connecting rod in axial view.

Preferred embodiments of the invention

[0012] In Fig.1 and 2 it can be seen in a perspective view, that the self-supported construction 1 of a forward opening door for covering of openings in the wall contains a frame 2 consisting of a support base 3 and of a frame window 4 connected to it. The frame window 4 has frame strips 5 and with them connected and perpendicular to them arranged covering strips 6. The whole frame 2 is fixed firmly to the wall, which is usually plasterboard, using suitable screws. There are holes for fastening means on the periphery of the frame 2. The cover strips 6 eliminate the need for the filler strips in gaps between the tiles which are otherwise used.

[0013] This rigid structure of the frame 2 is accompanied by movable elements which bear a not shown plate, on which the tiles are affixed so as to visually match with the surrounding tiles and the consumer does not even notices that the door is there.

[0014] In Fig. 3, these movable elements are visible, namely the swinging upper arm 7 and the swinging lower

arm 8, and these are connected by a connecting element, in this case with a hollow rod 9.

[0015] In Fig. 4 there is a detail of the support base 3. This support base 3 has a L-shaped cross-section, whereas a front face 10 can be seen from the outside and a lock surface 11, which is perpendicular to the front face 10, is directed into the wall and is not visible in the closed state of the structure 1 or the door. In the front face 10, at the edges of the support base 3, support flanges are provided, oriented towards the structure of the wall, namely an upper support flange 12 and a lower support flange 13. Both flanges 12, 13 are provided with holes 31.

[0016] In the lock surface 11 a recesses are provided, namely an upper recess 14 and the a recess 15. Swinging arms 7, 8 are rotatably mounted on the support flanges 12, 13.

[0017] How, it will be seen in Fig. 6, which shows a perspective view of the upper arm 7, and Fig. 7, which shows the front view of this upper arm 7 and in Fig. 8, in which the lower arm 8 is shown in detail in perspective view.

[0018] The arrangement of the arms 7, 8 on the flanges 12, 13 can be best seen in Fig. 2. On each of the arms 7, 8, which have a box-like structure with one open side, that is, essentially in the U-shaped cross-section, there are at both of the two free ends 16 rear wings 17 and front wings 17' always arranged on one side, both provided with openings 18. After assembly, the wings 17, 17' of the arms 7, 8 are the most distant from each other. This is because that at the upper arm 7 the wings 17, 17' are provided on the upper edge 20, seen after assembly, whereas at the lower arm 8, the wings 17, 17' are provided on the lower edge 19, again seen after assembly of the door.

[0019] In Fig. 7, it is best to see that one wall 30 of the arms 7, 8 is tilted at an angle inwardly in the arm 7, 8 and it is a wall 30 which is in the closed state of the door oriented into the frame 2 and the connecting rod 9 is then fastened to these walls 30. This is advantageous due to the optimal swinging of the arm 7, 8 when the door is opened.

[0020] Fig. 5 shows a support strip 22 as a support element 21 for the door plate having at its both ends bent support surfaces 23 in one direction and provided with flat shaped protrusions 24 on one side. On the support strip 22 a not shown support plate for tiles, known from the state of the art, is fixed

[0021] The door is assembled of the above mentioned components as follows: The arms 7, 8 are applied from inside to the support flanges 12, 13 by their rear wings 17. Both the rear wings 17 of the arms 7, 8 and the flanges 12, 13 are provided with openings 18 and 31 respectively. Through these holes, a pin is put through to ensure a mutually movable connection so that the arms 7, 8 can rotate relative to the stationary support flanges 12, 13 and thus to the frame 2.

[0022] On the front wings 17' of the arms 7, 8 the sup-

port strip 22 with its bent support surfaces 23 is then laid. Both the front wings 17' of the arms 7, 8 and the support surfaces 23 of the strip 22 are provided with openings 25. Through these openings a pin is put through which ensures the mutually movable connection of the arms 7,8 and the strip 22. The strip 22 with glued or otherwise fixed plate with a decor, e.g. tiles, can be swung away after forward opening in front of the wall due to the arms 7,8. In order to allow the swinging of the arms 7,8 in the maximum range, the upper recess 14 and the lower recesses 15 are provided in the lock surface 11.

[0023] On the outer surface 26 of the support strip 22 shown in Fig. 1, the plate for tiles is fixed, whereas the upper lock element 28, which is schematically shown in Fig. 5, is placed on the inner surface 27 and especially on the protrusions 24 and the lower lock element 29, which is on the perpendicular lock surface 11, is again shown schematically in Fig.4. The upper locking element 28 is preferably made as a hook and the lower locking element 29 is made as a spring loaded roller at the end of the longitudinal beam fixed to the locking surface 11. The hook pushes the roller and the roller then returns. The lock ensures that the tiles on the door are fitted with the surrounding tiles after closing the door. Fig. 9 shows a connecting rod 9 which is preferably made as a hollow square profiled rod 9. This rod 9 is fixing the arms 7, 8 in the desired position.

[0024] The present structure of the forward opening door for covering the openings in the wall is revolutionary in a comparison with the known systems as the self-supporting swinging arm is not pivotably arranged with one end on the inner side of the wall behind the opening and with the other end on the rear surface of the door or plate which carries the decorative element, generally tiles. The present invention has two pivot arms 7, 8 connected by the rod 9 and self-supporting construction is enabled by the frame 2 with a lateral support base 3 on which one end of the upper and lower arms 7, 8 and of the support element 21 for the door or the plate with decoration, which is a support strip 22 which is pivotally arranged at the other end of the upper and lower arms 7, 8. This enables an easy assembly of the whole structure together including the door outside of the wall and then the entire frame 2 with the door is inserted into the wall opening and it is fixed there. Arrangement of the arms 7, 8 and of the support element 21 and ensuring of their rotation is due to the pins placed in the respective openings very simple and operationally safe.

[0025] A solid metal frame construction enables easy opening and closing, rigidity of the entire construction and high service life. It enables easier mounting into the plasterboard or brick walls. It is also resistant for transport, suitable for various tile sizes and for their multiples. It can be used even for only one tile.

Claims

1. Self-supporting construction of forward opening door for covering of openings in a wall, where a pivotal swinging upper and lower arm (7, 8) are arranged between the wall and the door made as a frame (2) which has a shape of a frame window (4) and it is placeable with its horizontal frame strips (5) into the opening in the wall, whereas perpendicularly to frame strips (5) covering strips (6) on the front side of the frame window (4) are arranged, whereas a lateral support base (3), which is a part of the frame (2) has a L-shaped cross-section and it is formed by a front face (10) and by a lock surface (11), which is perpendicular on it and inwardly oriented into the wall, the lock surface (11) is provided with an upper recess (14) and with a lower recess (15) and from the front surface (10) protrude inwardly into the opening in the wall an upper bearing flange (12) and a lower bearing flange (13), on each of the arms (7, 8), which have a box-like structure with one open side, that is, essentially in the U-shaped cross-section, there are at both of the two free ends (16) rear wings (17) and front wings (17') always arranged on one side, both provided with openings (18), upper bearing flange (12) and lower bearing flange (13) are provided with openings for corresponding pins for a pivoting connection with the rear wings (17) of the upper arm (7) and of the lower arm (8), which are also provided with openings (18), whereby a support element (21) of the door, respectively the plate with the decoration which forms it, is rotatably arranged at the free end of the mentioned upper and lower arm (7, 8) and the upper arm (7) and the lower arm (8) are connected by connecting rod (9).
2. Self-supporting construction of forward opening door according to claim 1, **characterised in that** the support element (21) is created as a strip (22), which has on its peripheries perpendicular support surfaces (23) with openings (25) and protrusions (24) for increasing of the contact surface and simultaneously placing of an upper lock element (28) whereas a lower lock element (29) is on the perpendicular lock surface (11).

Patentansprüche

1. Selbsttragende Konstruktion einer nach vorne öffnenden Tür zur Abdeckung von Öffnungen in einer Wand, die mit schwenkbaren oberen und unteren Schenkel (7,8) versehen ist und die Konstruktion zwischen der Wand und dem Tür angeordnet ist und sie ist als ein Rahmen (2) in der Form eines Fensterrahmens (4) ausgebildet, welcher mit seinen horizontalen Leisten (5) in die Öffnung in der Wand

eingelagert werden kann, wobei senkrecht zu den Rahmenleisten (5) Abdeckleisten (6) auf der Frontseite des Fensterrahmens (4) angeordnet sind, wobei die seitliche Tragbasis (3), die Teil des Rahmens (2) ist, im Schnitt eine Form von der Buchstabe L hat und von einer Stirnfläche (10) und Schliessfläche (11) gebildet ist, wobei die Stirnfläche (10) zur Schliessfläche (11) senkrecht angeordnet ist und nach Innen des Rahmens (2) und auch nach Innen der Öffnung in der Wand orientiert ist, wobei die Schliessfläche (11) mit einer oberen Aussparung (14) und einer unteren Aussparung (15) versehen ist und dass aus der Stirnfläche (10) in Richtung nach Innen der Öffnung in der Wand ein oberer Tragflansch (12) und ein unterer Tragflansch (13) für jede von den Schenkel (7,8) ausragen, die Schenkel haben eine Schachtelkonstruktion mit einer offenen Seite, und sie haben grundsätzlich im Schnitt eine Form von der Buchstabe U, wobei auf beiden offenen Enden (16) immer auf einer Seite ein hinteres Flügel (17) und ein vorderes Flügel (17') angeordnet sind, beide mit Öffnungen (18) versehen, wobei der obere Tragflansch (12) und der untere Tragflansch (13) mit Öffnungen (31) für entsprechende Zapfen zur Drehverbindung mit dem hinteren Flügel (17) des oberen Schenkels (7) und des unteren Schenkels (8), die auch mit Öffnungen (18) versehen sind, wobei ein Tragelement (21) des Türes respective der Platte mit einer Dekoration drehend auf freien Enden von oberem und unterem Schenkel (7,8) angeordnet ist und der obere Schenkel (7) und der untere Schenkel (8) sind mit einer Verbindungsstange (9) verbindet.

2. Selbsttragende Konstruktion einer nach vorne öffnenden Tür nach dem Anspruch 1, **dadurch gekennzeichnet, dass** der Tragelement (21) als eine Leiste (22) durchgeführt ist, welche auf ihren Ränder senkrechte Tragflächen (23) mit Öffnungen (25) hat und ist mit Vorsprüngen (24) für Vergrößerung der Kontaktfläche und zugleich zur Anordnung eines oberen Schliesselementes (28), wobei ein unterer Schliesselement (29) auf der senkrechten Schliessfläche (11) angeordnet ist.

Revendications

1. Construction autoportante de porte coulissante pour couvrir des ouvertures dans un mur, qui est munie d'un bras supérieur et inférieur pivotant (7, 8) et la structure est située entre le mur et la porte et formée comme un cadre (2) sous la forme d'une fenêtre de cadre (4) pouvant être placée avec ses bandes de cadre horizontales (5) dans une ouverture dans le mur, les bandes de couverture (6) étant disposées perpendiculairement aux bandes de cadre (5) sur la face avant du cadre fenêtre (4), la base d'appui latérale (3) faisant partie du cadre (2) a une

section transversale en forme de L et est formée d'une surface avant (10) et d'une surface de verrouillage 11 qui lui est perpendiculaire et orientée vers l'intérieur le cadre (2) et dans l'ouverture dans le mur, la surface de verrouillage (11) étant pourvue d'un évidement supérieur (14) et l'évidement inférieur (15) et la bride de support supérieure (12) et la bride de support inférieure (13) pour chacun des bras (7, 8), qui ont une construction en caisson avec un côté ouvert, et sont essentiellement en forme de U en section transversale, avec les deux sur celui-ci à chaque extrémité libre (16) sont disposées d'un côté les ailes arrière (17) et les ailes avant (17'), toutes deux pourvues d'ouvertures (18), la bride supérieure d'appui (12) et la bride inférieure d'appui (13) étant pourvues d'ouvertures (31) pour des axes correspondants pour liaison pivotante aux ailes arrière (17) le bras supérieur (7) et le bras inférieur (8), qui sont également pourvus d'ouvertures (18), l'élément de support (21) de la porte et le panneau de décoration, respectivement, étant agencés de manière rotative aux extrémités libres desdits bras supérieur et inférieur (7) ; 8) et les bras supérieur et inférieur (7, 8) sont reliés par une bielle (9).

2. Construction autoportante d'une porte coulissante selon la revendication 1, **caractérisée en ce que** l'élément de support (21) est conçu comme une bande (22) qui présente à ses bords des surfaces d'appui perpendiculaires (23) avec des ouvertures (25) et il a des saillies (24) pour augmenter la surface de contact et loger en même temps l'élément de verrouillage supérieur (28), l'élément de verrouillage inférieur (29) étant sur une surface de verrouillage perpendiculaire (11).

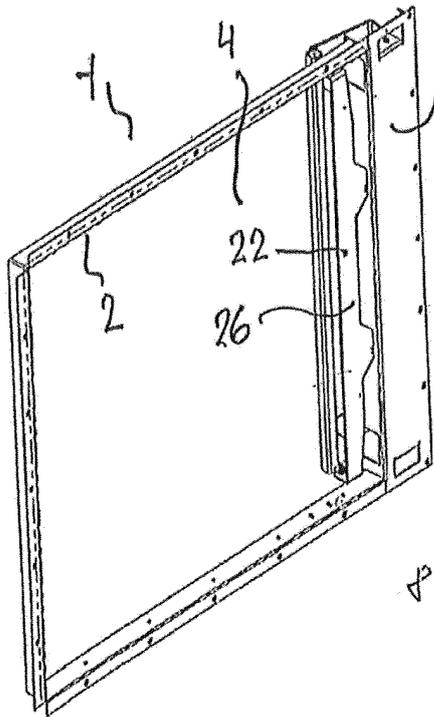


Fig. 1

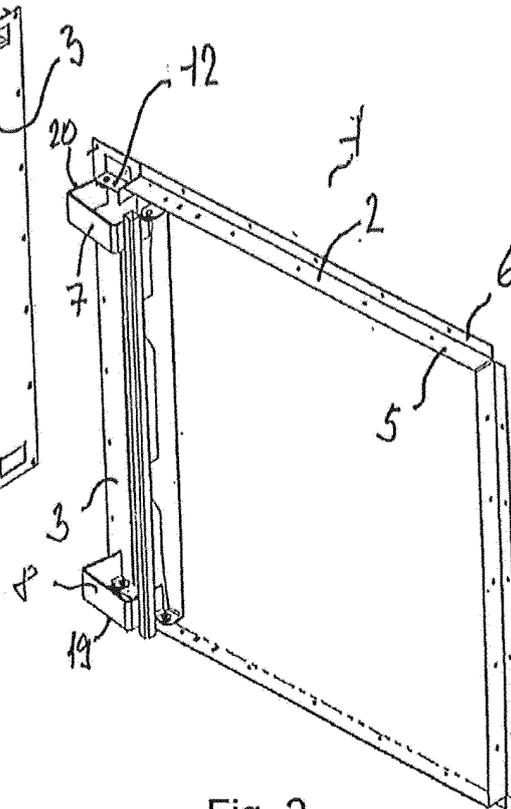


Fig. 2

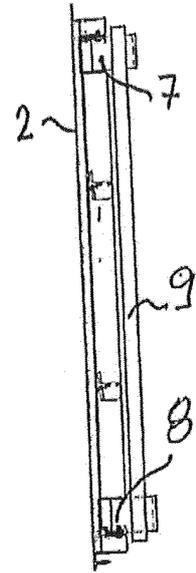


Fig. 3

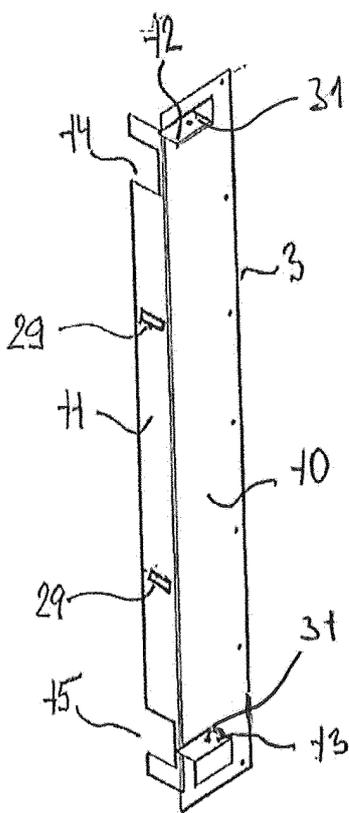


Fig. 4

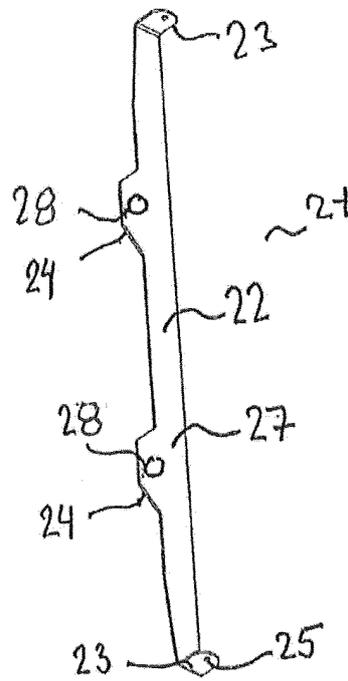


Fig. 5

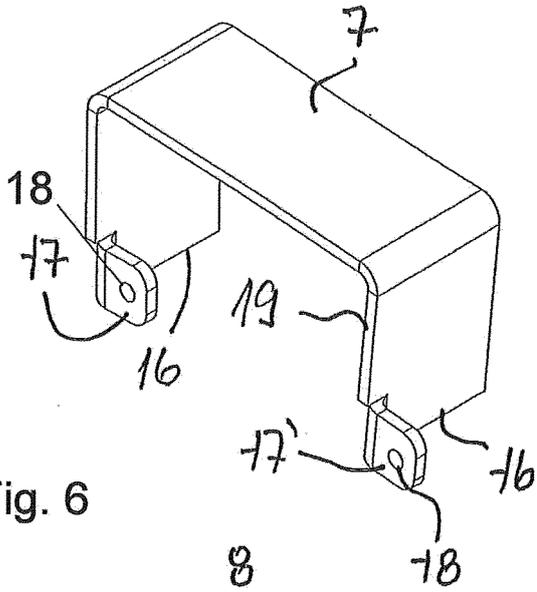


Fig. 6

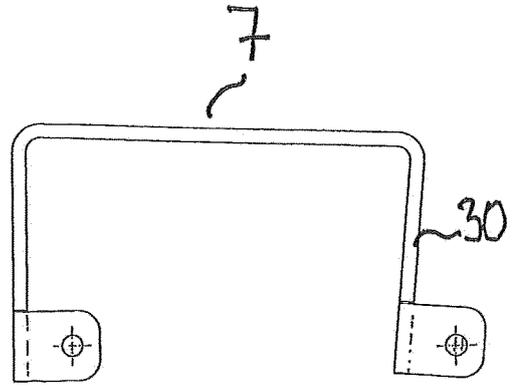


Fig. 7

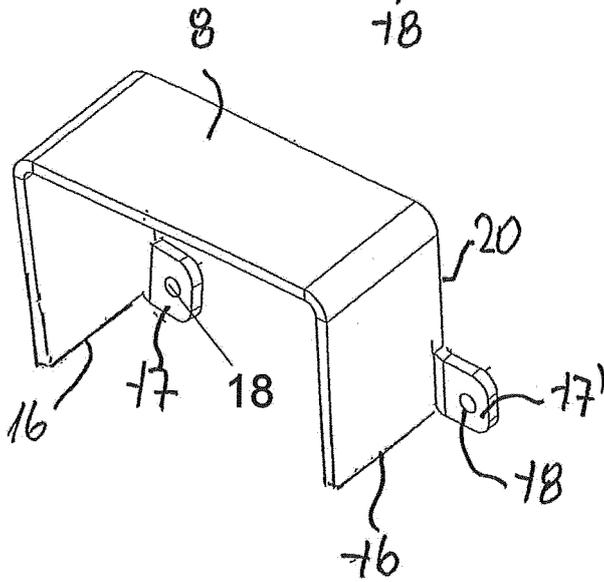


Fig. 8

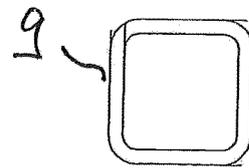


Fig. 9

REFERENCES CITED IN THE DESCRIPTION

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