



- (51) International Patent Classification:
E05D 5/02 (2006.01) *F25D 23/02* (2006.01)
- (21) International Application Number:
PCT/TR2019/050275
- (22) International Filing Date:
24 April 2019 (24.04.2019)
- (25) Filing Language: Turkish
- (26) Publication Language: English
- (30) Priority Data:
2018/18382 03 December 2018 (03.12.2018) TR
- (71) Applicant: **İPEK ENDÜSTRİYEL SOĞUTMA SİSTEMLERİ ALÜMİNYUM NAKLİYAT TARIM HAYVANCILIK İTHALAT İHRACAT SANAYİ TİCARET LİMİTED ŞİRKETİ** [TR/TR]; Anabağlar Mahallesi 1402 Sokak No:2, Seydişehir/Konya (TR).
- (72) Inventor: **KOYUN, Harun**; Anabağlar Mh. 1404 Sk. No:2, 42360 Konya (TR).
- (74) Agent: **DESTEK PATENT, INC.**; Lefkoşe Cad. NM Ofis Park B Blok No: 36/5, Beşevler, 16110 Bursa (TR).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN,

HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

- with international search report (Art. 21(3))
- in black and white; the international application as filed contained color or greyscale and is available for download from PATENTSCOPE

(54) Title: CONCEALED HINGE

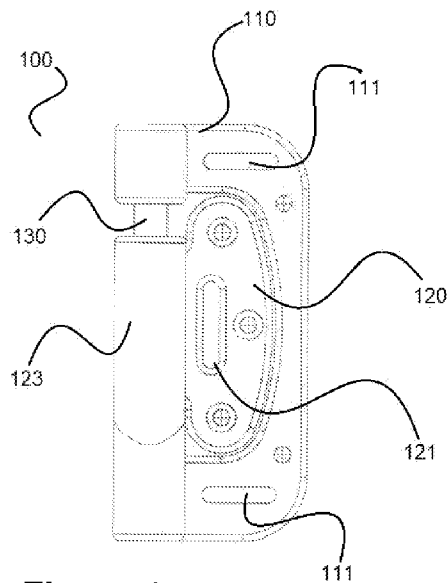


Figure-1

(57) Abstract: The invention relates to a concealed hinge (100) which is designed to be used in industrial type cold storage depots and is protected from external interference by being positioned between the door and its casing. The most fundamental feature of the said 5 concealed hinge (100) is its positioning in the space between the door and the door frame of the cold storage depot. In this way, the door can be completely embedded in the frame. The embodiment of the concealed hinge (100) into the door and door frame prevents any unauthorized intervention from the outside and ensures the safety of the products inside the storage depot.

CONCEALED HINGE

Technical Field

The invention relates to a concealed hinge which is designed to be used in industrial type cold storage depots and is protected from external interference by being positioned between the door and its casing.

- 5 The invention particularly relates to a concealed hinge placed in the cavity between the door and its casing, which allows the door to attach into the frame independent of the thickness of the door of the cold storage depot, due to the channels formed in rigid and mobile elements of the door frame.

Prior Art

- 10 Storing food in cold environments is the most efficient method for centuries. In the ancient ages, the snow was used to prevent or delay food spoilage, then following the 1800s, the cold air instruments were developed, and a great era has been opened on the preservation of food. The cold storage is a warehouse that is preferred to extend the life of the foods to be preserved and to minimize process temperatures in food
15 manufacturing, which consists of the panels with polyurethane foam filling between the walls around it and in its roof. This type of cooling systems can be ammonia or Freon refrigeration. These cooling devices consist of evaporators within the room and condenser units outside the room. Fruits and vegetables that are still raw, or rapidly deteriorating agricultural products, or dairy products such as milk, should be kept in a
20 cold environment during the period from production to consumption.

- One of the most significant factors affecting the internal temperature of cold storage is the insulation of the door. Since the door is a movable structure, it is of great importance that the heat insulation is fully and adequately assembled in the part where it sits within its frame. The hinges used in the opening and closing mechanisms of the doors with
25 heavy structures need to be designed in larger dimensions to carry the load it is exposed to. The hinges that are being used today are subject to high friction due to the load they carry, and a sag may occur depending on the weight of the door over time. The fact that the hinges are mounted outside the cold storage depots allows direct access to the storages from outside dodging the locks. Mounting hinges in such a way
30 that they are easily accessible from the outside causes a significant security

vulnerability in the protection of the products stored in cold storage against theft. Without unlocking, the door can be opened with only dismantling the hinges, and the products in the storage can be taken without permission. On the other hand, mounting hinges outside the door causes the door to close on top without being embedded in the case. Due to the mounting shape of the hinge on the outer surface of the storage, the door has an elevation or a protrusion which causes the usage area to narrow. The structure and working principles of the existing hinges and upgrade mechanisms shorten the material life and cause the depot cover to fail in a short time.

Various studies have been carried out to improve door hinges used in industrial areas such as cold storage depots and to solve existing problems. One of these studies based on the utility model titled "Development in Double-acting Door" with application no. TR201404780. This invention relates to the development of the double-acting door. The invention is used in factories, warehouses, manufacturing facilities, cold storages, food production and processing facilities, dining halls and other places where forklifts, pallet trucks, hand trolleys, and service vehicles are heavily used. The double-acting door of the invention provides the hygienic isolation of the space in which it is used against the external environmental conditions and prevents the heat loss due to the fact that it is closed by itself during the non-use times and provides hygienic use by opening and closing without contacting with hand. In addition, due to the specially designed hinges, the blades can be fixed with a 90-degree opening. With the development made in the double-acting door of the invention, it is possible to use the plexiglass material as well as the polycarbonate, polyethylene, soft PVC and similar materials which are suitable for the purpose and area of the use, thus it can be used in various areas and it is possible to have a long-term use.

As a result, the need for a concealed hinge that resolves the disadvantages in the present technique and the absence of an existing solution necessitated an improvement in the relevant technical field.

Brief Description of the Invention

The invention relates to a concealed hinge that resolves the disadvantages in the present technique and offers additional advantages, and that is designed to be used in industrial type cold storage depots and is protected from external interference by being positioned between the door and its casing.

Based on the prior art, the purpose of the invention is to ensure that the fixed and movable parts of the casing are interlinked by the channel design of the concealed hinge developed.

5 The purpose of the invention is to ensure that the door is located outside the outer frame of the door for insulation purposes only via the channels contained in the concealed hinge, regardless of the thickness of the door of the cold storage, and in this way, both the insulation and the area in front of the door are used to the maximum level.

10 Another purpose of the invention is to reduce the counter-forces, frictions, and stresses on the movable frame pieces during rotational motion by means of the shaft slot with the optimum radius, which provides the elevation mechanics of the concealed hinge, and to reduce the stresses on both the shaft and the moving frame piece.

Another purpose of the invention is to prevent the concealed hinge from opening in any way from outside as it is located in the space between the door and the door frame.

15 Another purpose of the invention is to ensure that the concealed hinges can rotate 180 degrees through the channels and that the height of the hinges can be kept constant during this movement.

20 The structural and characteristic features and all advantages of the invention outlined in the drawings below and in the detailed description made by referring these figures will be understood clearly, therefore the evaluation should be made by taking these figures and detailed explanation into consideration.

Brief Description of Figures

In order to be able to understand the advantages of the present invention together with the additional elements, it is necessary to evaluate it with the figures explained below.

Figure-1 is a schematic view of the closed version of the concealed hinge,

25 Figure-2 is a schematic view of the demounted version of the concealed hinge.

Reference Numbers

- 100. Concealed Hinge
- 110. Fixed piece
- 111. Channel
- 30 112. Radius slot
- 120. Movable piece

- 121. Screw channel
- 122. Shaft channel
- 123. Radius surface
- 130. Shaft
- 5 131. Shaft slot

Detailed Description of the Invention

In this detailed description, concealed hinge (100) of the invention, which is designed to be used in industrial type cold storage depots and is protected from external interference by being positioned between the door and its casing, is described only as an example for better understanding of the subject without creating any limiting effect.

The concealed hinge (100) shown in Figure 1 consists of fixed piece (110) mounted on the door frame of the cold storage depot, movable piece (120) mounted on the door of the cold storage depot, and shaft (130) connected to the fixed piece (110) through this movable piece (120). The said movable piece (120) rotates on the shaft (130) to open and close the door. The said fixed piece (110) and the movable piece (120) are interconnected. The channel (111), which allows the door to be embedded in and shifted to a certain extent on the horizontal axis, is positioned on the fixed piece (110), and the screw channel (121), which allows it to move on the vertical axis, is positioned on the movable piece (120). By means of the movement on said horizontal and vertical axes, it is ensured that the movable door wing is fully engaged in the fixed frame. Through the said channel (111) and screw channel (121), it is ensured that the door is located outside the outer frame of the door for insulation purposes only, regardless of the thickness of the door of the cold storage depot.

The shaft (130) passing through the shaft channel (122) of the movable piece (120) shown in Figure 2 is connected to the fixed piece (110) corresponding to each other is designed in a way that one of the sides is a radius slot (112) with an intrusion and protrusion while other of the two shaft slots (131) having a flat section. The shaft (130) passing through the middle part of the said movable piece (120) sits in the shaft slots (131) located on the fixed piece (110). The correspondence of the said shaft slot (131) at the bottom of the fixed piece (110) is created in the form of the radius slot (112). There is also a radius surface (123) with intrusions and projections on the contact surface of the said movable piece (120). Due to the said radius slot (112) and the radius

surface (123), the stresses that occur during the movement of the door have been reduced to a minimum.

The most fundamental feature of the said concealed hinge (100) is its positioning in the space between the door and the door frame of the cold storage depot. In this way, the door can be completely embedded in the frame. The embodiment of the concealed hinge (100) into the door and door frame prevents any unauthorized intervention from the outside and ensures the safety of the products inside the storage depot. Through the channel (111) and the screw channel (121) comprised by the said concealed hinge (100), it is ensured that the door can rotate 180 degrees. During the said rotational motion, the height of the door which reaches the maximum height due to the radius slot (112) and the radius surface (123) is maintained and is prevented from falling down during that rotational motion. In case of using profiles designed in line with the channel (111) and screw channel (121) in the mentioned concealed hinge (100), the concealed hinge (100) can be prevented from being seen inside the door as well as outside the door.

CLAIMS

1. A concealed hinge (100) designed to be used in industrial type cold storage depots and is protected from external interference by being positioned between the door and its frame, characterized by comprising the channel (111), which
5 allows the door to be embedded in and shifted to a certain extent on the horizontal axis, is positioned on the fixed piece (110), and the screw channel (121), which allows the door to move on the vertical axis, is positioned on the movable piece (120).
2. A concealed hinge (100) according to Claim 1, characterized by comprising a
10 fixed piece (110) embedded in the door frame.
3. A concealed hinge (100) according to Claim 1, characterized in that the concealed hinge (100) comprises a movable piece (120) which is completely engaged in the fixed piece (110) at the closed position.
4. A concealed hinge (100) according to Claim 1, characterized in that the shaft
15 (130) passing through the shaft channel (122) placed at the bottom of the fixed piece (110) comprises a radius slot (112) having an intrusion and projection to which the shaft is connected to the fixed piece (110).
5. A concealed hinge (100) according to Claim 1, characterized in that the
20 movable piece (120) comprises a radius surface (123) with an intrusion and a protrusion positioned on the contact surface with the radius slot (112).
6. A concealed hinge (100) according to Claim 1, characterized in that the said concealed hinge is positioned in the space between the door and the door frame of the cold storage depot.
7. A concealed hinge (100) designed to be used in industrial type cold storage
25 depots, characterized in that the moving door wing precisely fits into the door frame through the channel (111) which provides a sliding motion at a certain rate in the horizontal axis and the screw channel (121) which allows to move in the vertical axis.
8. A concealed hinge (100) according to Claim 7, characterized in that through the
30 channel (111) and the screw channel (121) comprised by the said concealed hinge (100), ensured that the door can rotate 180 degrees.

9. A concealed hinge (100) according to Claim 7, characterized in that during the rotational movement, the door reaches the maximum height and the height is maintained until the 180° turn is completed due to the radius slot (112) and the radius surface (123).
- 5 10. A concealed hinge (100) according to Claim 7, characterized in that the said fixed piece (110) and the movable piece (120) are interconnected.
11. A concealed hinge (100) according to Claim 7, characterized in that through the said channel (111) and screw channel (121), ensured that the door is located outside the outer frame of the door for insulation purposes only, regardless of
10 the thickness of the door of the cold storage depot.

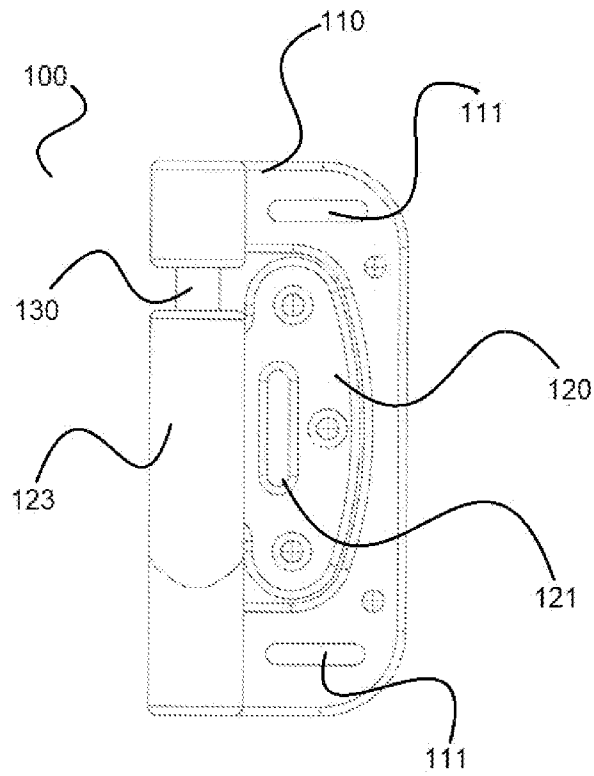


Figure-1

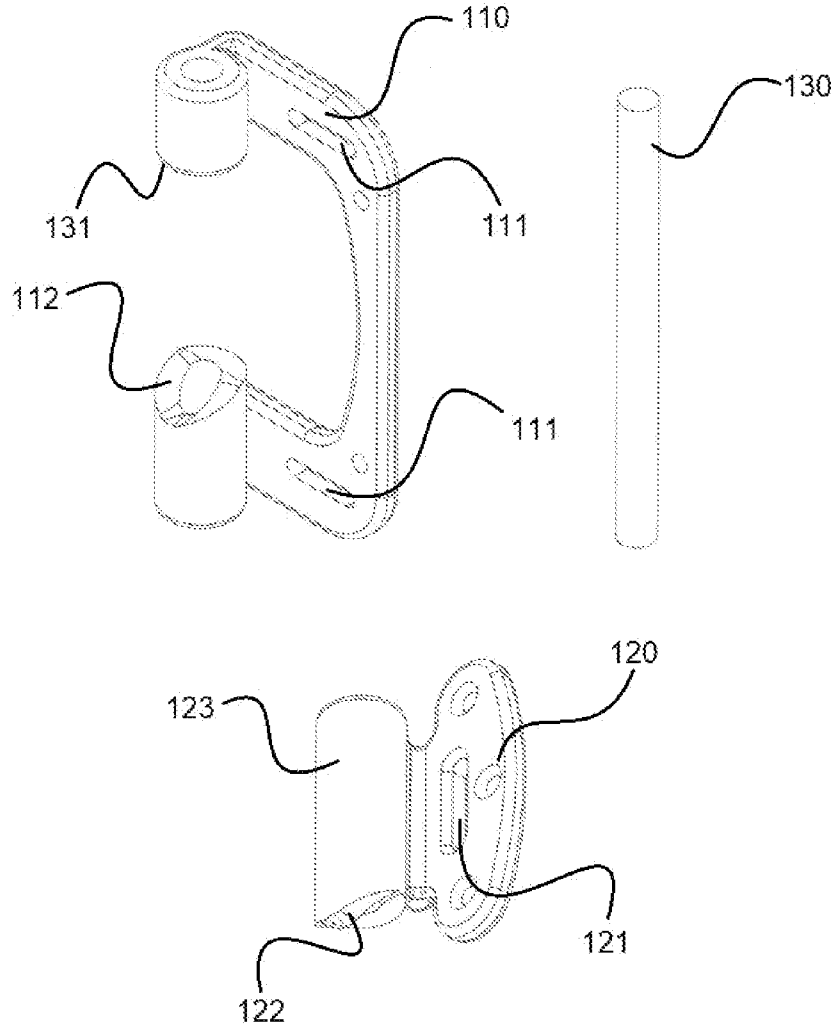


Figure-2

INTERNATIONAL SEARCH REPORT

International application No.

PCT/TR2019/050275

A. CLASSIFICATION OF SUBJECT MATTER E05D 5/02 (2006.01)i; F25D 23/02 (2006.01)i According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) E05D; F25D Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	CN 106930634 A (TIANJIN BAODI DISTR LIYI HARDWARE FACTORY) 07 July 2017 (2017-07-07) Abstract, Description paragraphs 11-17, Drawings	1-3,6-8,10-11 4,5,9
A	CN 2818714 Y (AOLIN HARDWARE CO LTD WENZHOU [CN]) 20 September 2006 (2006-09-20) Abstract, Description page 4	1-11
A	CN 204804541 U (LANXI MAYA HARDWARE CO LTD) 25 November 2015 (2015-11-25) Abstract, Description paragraphs 18-23	1-11
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
<p>* Special categories of cited documents:</p> <p>“A” document defining the general state of the art which is not considered to be of particular relevance</p> <p>“E” earlier application or patent but published on or after the international filing date</p> <p>“L” document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>“O” document referring to an oral disclosure, use, exhibition or other means</p> <p>“P” document published prior to the international filing date but later than the priority date claimed</p> <p>“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>“X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>“Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>“&” document member of the same patent family</p>		
Date of the actual completion of the international search 11 February 2020		Date of mailing of the international search report 11 February 2020
Name and mailing address of the ISA/TR Turkish Patent and Trademark Office (Turkpatent) Hipodrom Caddesi No. 13 06560 Yenimahalle Ankara Turkey Telephone No. (90-312) 303 11 82 Facsimile No. +903123031220		Authorized officer OZLEN PEKOL Telephone No.

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/TR2019/050275

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
CN	2818714	Y	20 September 2006	CN	2818714Y	Y	20 September 2006
CN	204804541	U	25 November 2015	CN	204804541U	U	25 November 2015
CN	106930634	A	07 July 2017	CN	106930634	A	07 July 2017