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(54) **OVEN**

(57) An oven includes an oven body (10), a heating element (22), a frame (24), and an oven door (32). The oven body (10) has an inner space (10a) inside and includes a front plate (12), wherein the front plate (12) has an entrance (122) that communicates with the inner space (10a). The heating element (22) is adapted to heat the inner space (10a). The frame (24) is engaged with the oven body (10) and has an abutted portion (28a). The oven door (32) is pivotally connected to the oven body (10) and is located at the entrance (122). The oven door (32) could pivot to a close position (P1) to close the entrance (122) and could pivot downward to an open position (P2) from the close position (P1) to open the entrance (122). When the oven door (32) is located at the open position (P2), the second surface (32b) abuts against the abutted portion (28a) of the frame (24), thereby forming a platform outside the entrance (122) for placing objects.

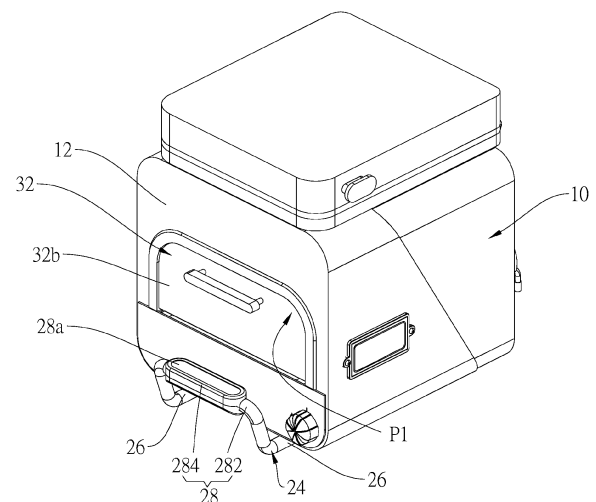


FIG.1

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Description

BACKGROUND OF THE INVENTION

Technical Field

[0001] The present invention relates generally to a heating apparatus, and more particularly to an oven.

Description of Related Art

[0002] The conventional oven includes an oven body, a heating element, and an oven door. The oven body has an inner space for place objects ready for being baked. The oven body has an entrance that communicates with the inner space. The objects could be put into or taken out through the entrance. The heating element is adapted to heat the inner space. The oven door is pivotally connected to the oven body and is adapted to close or open the entrance.

[0003] During a baking process, a user often has to add additional ingredients to the baked objects, such as spread jam. Since the conventional oven door is unable to carry the food, the user needs to pull out the food to the entrance and to reach hands into the inner space to add the additional ingredients. It should be noted that the hands of the user are easy to be burned during the aforementioned process when the user is not careful to touch an inner wall of the inner space.

[0004] Therefore, the conventional oven has room for improvement.

BRIEF SUMMARY OF THE INVENTION

[0005] In view of the above, the primary objective of the present invention is to provide an oven, wherein an oven door of the oven could form a platform for putting stuff when the oven door is opened.

[0006] The present invention provides an oven, including an oven body, a heating element, a frame, and an oven door, wherein the oven body has an inner space inside. The oven body includes a front plate, wherein the front plate has an entrance that communicates with the inner space. The heating element is disposed in the oven body and is adapted to heat the inner space. The frame is engaged with the oven body and has an abutted portion, wherein the abutted portion is located outside the entrance. The oven door is pivotally connected to the oven body and is located at the entrance. The oven door has a first surface and a second surface that face opposite directions. When the oven door pivots to a close position, the entrance is closed. When the oven door pivots down to an open position from the close position, the entrance is opened. When the oven door is located at the close position, the first surface of the oven door faces the inner space. When the oven door is located at the open position, the second surface of the oven door is abutted against the abutted portion of the frame.

[0007] With such design, when the oven door is located at the open position, a platform could be formed at the outside of the entrance. Since the abutted portion of the frame abuts the second surface of the oven door, the bearing ability of the oven door could be increased, thereby allowing the user to put the baked object on the first surface of the oven door.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0008] The present invention will be best understood by referring to the following detailed description of some illustrative embodiments in conjunction with the accompanying drawings, in which

FIG. 1 is a perspective view of the oven of an embodiment according to the present invention;

FIG. 2 is a perspective view of the oven of the embodiment according to the present invention seen from another perspective;

FIG. 3 is a side view of the oven of the embodiment according to the present invention;

FIG. 4 is a partially exploded view of the oven of an embodiment according to the present invention;

FIG. 5 is a perspective view of the oven door of the embodiment according to the present invention;

FIG. 6 is a perspective view of the oven door of the embodiment according to the present invention seen from another perspective;

FIG. 7 is a perspective view of the oven of the embodiment according to the present invention, showing a partial section;

FIG. 8 is an enlarged partial view of a marked region A in FIG. 7;

FIG. 9 is an enlarged partial view of a marked region A in FIG. 7, wherein the oven door is omitted;

FIG. 10 is a side view of the oven shown in FIG. 7;

FIG. 11 is similar to FIG. 7, showing the oven door is opened; and

FIG. 12 is a side view of the oven shown in FIG. 11.

DETAILED DESCRIPTION OF THE INVENTION

[0009] As illustrated in FIG. 1 to FIG. 12, an oven of an embodiment of the present invention includes an oven body 10, a heating element 22, a frame 24, and an oven door 32.

[0010] The oven body 10 includes a front plate 12 and a rear plate 14, which are opposite to each other, wherein the oven body 10 has an inner space 10a that could be heated. The front plate 12 has an entrance 122 which communicates with the inner space 10a. As illustrated in FIG. 7 to FIG. 9, a carrier plate 16 is disposed in the oven body 10 and is located at a bottom portion of the inner space 10a, wherein the carrier plate 16 is adapted to carry objects for being baked, such as food. The oven body 10 further includes a bridge plate 18 which is located

at a bottom portion of the entrance 122 and has an inner side 182. The inner side 182 of the bridge plate 18 is adjacent to the carrier plate 16. Preferably, the inner side 182 is abutted against the carrier plate 16. The bridge plate 18 has two pivotally connecting portions 184 which are located at two opposite sides of the bridge plate 18. A groove 186 is located between each of the pivotally connecting portion 184 and the carrier plate 16. A portion between the two grooves 186 of the bridge plate 18 forms a bridging portion 188, wherein the bridging portion 188 extends away from the carrier plate 16. Each of the grooves 186 has a wall 186a that is curved and faces toward the inner space 10a. The oven body 10 further includes a shield 20 which is located at an outer side of the bridge plate 18, wherein the outer side of the bridge plate 18 and a side of the bridge plate 18 facing the oven body 10, wherein the outer side and the side of the bridge plate 18 face opposite directions.

[0011] As illustrated in FIG. 7, the heating element 22 is disposed in the oven body 10 and heats the inner space 10a. In the current embodiment, the heating element 22 could be, but not limited to, a gas burner.

[0012] The frame 24 is engaged with the oven body 10. In the current embodiment, the frame 24 includes two supporting sections 26, a first holding section 28, and a second holding section 30, wherein the two supporting sections 26 are two straight tubes which are connected to the bottom portion of the oven body 10 and are parallel to each other. Each of the supporting sections 26 extends in a direction from the front plate 12 to the rear plate 14. The first holding section 28 is located outside the entrance 122 and is below the entrance 122. The first holding section 28 is connected to an end of each of the two supporting sections 26 and has an abutted portion 28a, wherein the abutted portion 28a is located lower than a bottom edge of the entrance 122. The second holding section 30 is located outside the rear plate 14 and is connected to another end of each of the two supporting sections 26. The first holding section 28 and the second holding section 30 are respectively located at a front side and a rear side of the oven body 10 and are symmetrical.

[0013] More particular, the first holding section 28 includes a first extending tube 282 and a grip (which is defined as a first grip 284). Two ends of the first extending tube 282 are respectively connected to front ends of the two supporting sections 26, and the first extending tube 282 extends upward. The first grip 284 fits around a top portion of the first extending tube 282. A surface of the first grip 284 constitutes the abutted portion 28a. The second holding section 30 includes a second extending tube 302 and a grip (which is defined as a second grip 304). Two ends of the second extending tube 302 are respectively connected to rear ends of the two supporting sections 26, and the second extending tube 302 extends upward. The second grip 304 fits around a top portion of the second extending tube 302. A user could hold the first holding section 28 and the second holding section 30 with two hands to lift up the oven. Since the two sup-

porting sections 26 evenly support the bottom portion of the oven body 10, the oven body 10 could be stably lifted up.

[0014] The oven door 32 is pivotally connected to the oven body 10 and is located at the entrance 122. As illustrated in FIG. 5 and FIG. 6, the oven door 32 has a first surface 32a and a second surface 32b which face opposite directions. The oven door 32 could pivot between a close position P1 (as shown in FIG. 1) and an open position P2 (as shown in FIG. 11). When the oven door 32 pivots to the close position P1, the entrance 122 is closed, wherein the first surface 32a of the oven door 32 faces the inner space 10a. When the oven door 32 pivots downward at a predetermined angle to move from the close position P1 to the open position P2, the entrance 122 is opened to allow the second surface 32b of the oven door 32 is abutted against the abutted portion 28a of the frame 24. In the current embodiment, the predetermined angle is approximately 90 degrees.

[0015] In particular, as illustrated in FIG. 5 to FIG. 10, the oven door 32 includes a door plate 34, wherein the door plate 34 has the first surface 32a. A bottom portion of the door plate 34 has two extending portions 342, and a recess 344 is formed between the two extending portions 342. Each of two sides of the bottom portion of the door plate 34 has a pivot ear 346, wherein the two pivot ears 346 face to each other. The two pivot ears 346 are respectively connected to the two extending portions 342. The two pivot ears 346 are pivotally connected to the two pivotally connecting portions 184 of the bridge plate 18 of the oven body 10. When the oven door 32 pivots to the close position P1, the two extending portions 342 are respectively inserted into the two grooves 186 along the curved walls 186a of the two grooves 186, and the recess 344 fits around the bridging portion 188 of the bridge plate 18. While the oven door 32 is pivoting to the open position P2, the two extending portions 342 are moved out of the two grooves 186 along the curved wall 186a of the two grooves 186. When the oven door 32 is located at the open position P2, the recess 344 is located right above the bridging portion 188.

[0016] In the current embodiment, the oven door 32 further includes a thermal insulation plate 36 to increase a thermal insulation ability of the oven door 32, wherein the thermal insulation plate 36 has insulation material inside. The thermal insulation plate 36 is engaged with a side of the door plate 34 which is opposite to the first surface 32a. An outer surface of the thermal insulation plate 36 forms the second surface 32b. A slot is formed between each of the pivot ears 346 and a bottom edge of the thermal insulation plate 36. As illustrated in FIG. 11 and FIG. 12, when the oven door 32 pivots to the open position P2, a top edge of the shield 20 is inserted into the two slots 362. The recess 344 of the door plate 34 is located right above the top edge of the shield 20.

[0017] With such design, when the oven door 32 is located at the open position P2, the oven door 32 could form a platform located outside the entrance 122, where-

in the platform could be used for placing objects (for example a baked object) temporarily. Since the second surface 32b of the oven door 32 is abutted by the abutted portion 28a of the frame 24 to increase a bearing capacity of the oven door 32, the user could rest assured that the baked object could be firmly placed on the first surface 32a of the oven door 32, thereby avoiding the user to be scalded by inner walls of the oven body 10. The bridge plate 18 under the recess 344 could be a connecting bridge between the bottom portion of the entrance 122 and the carrier plate 16, so that a gap is not formed between the bottom portion of the entrance 122 and the carrier plate 16. When the baked object is moved into the inner space 10a, the baked object could be moved from the first surface 32a of the oven door 32 could be moved to the carrier plate 16 from the first surface 32a of the oven door 32 through the bridge plate 18. On contrary, when the baked object is moved out, the baked object could be moved from the carrier plate 16 to the first surface 32a of the oven door 32 through the bridge plate 18. Therefore, it is beneficial to move the baked object between the first surface 32a of the oven door 32 and the carrier plate 16.

[0018] Additionally, since the thermal insulation plate 36 abuts against the abutted portion 28a, a thermal energy of the oven door 32 is hard to transfer to the first grip 284 of the first holding section 28. Therefore, even if the user holds the first grip 284 right after the oven door 32 is turned back to the close position P1, the hands of the user do not be scalded.

[0019] It must be pointed out that the embodiment described above is only a preferred embodiment of the present invention. All equivalent structures which employ the concepts disclosed in this specification and the appended claims should fall within the scope of the present invention.

Claims

1. An oven, comprising:

an oven body (10) having an inner space (10a) inside and comprising a front plate (12), wherein the front plate (12) has an entrance (122) that communicates with the inner space (10a);
a heating element (22) disposed in the oven body (10) and adapted to heat the inner space (10a);
a frame (24) engaged with the oven body (10) and having an abutted portion (28a), wherein the abutted portion (28a) is located outside the entrance (122);
an oven door (32) pivotally connected to the oven body (10) and located at the entrance (122), wherein the oven door (32) has a first surface (32a) and a second surface (32b) which face opposite directions; when the oven door (32) piv-

ots to a close position (P1), the entrance (122) is closed; when the oven door (32) pivots down to an open position (P2) from the close position (P1), the entrance (122) is opened; when the oven door (32) is located at the close position (P1), the first surface (32a) of the oven door (32) faces the inner space (10a); when the oven door (32) is located at the open position (P2), the second surface (32b) of the oven door (32) is abutted against by the abutted portion (28a) of the frame (24).

2. The oven as claimed in claim 1, wherein the oven door (32) comprises a door plate (34), the door plate (34) has the first surface (32a) and two pivot ears (346); the two pivot ears (346) are pivotally connected to the oven body (10).

3. The oven as claimed in claim 2, wherein the oven body (10) is disposed with a carrier plate (16); the carrier plate (16) is located at a bottom portion of the inner space (10a); the oven body (10) comprises a bridge plate (18) which is located at a bottom portion of the entrance (122); the bridge plate (18) has an inner side which is adjacent to the carrier plate (16) and has two pivotally connecting portions (184) located at two opposite sides of the bridge plate (18); a groove (186) is located between each of the two pivotally connecting portions (184) and the carrier plate (16); a bridging portion (188) is formed between the two groove (186)s of the bridge plate (18); the door plate (34) has two extending portions (342), and a recess (344) is formed between the two extending portions (342); the two pivot ears (346) respectively connected to the two extending portions (342); the two pivot ears (346) are pivotally connected to the two pivotally connecting portions (184) of the bridge plate (18) of the oven body (10); when the oven door (32) pivots to the close position (P1), the two extending portions (342) are respectively entered into the two grooves (186), and the recess (344) fits around the bridging portion (188) of the bridge plate (18); when the oven door (32) pivots to the open position (P2), the two extending portions (342) leaves the two groove (186)s, and the recess (344) is located right above the bridging portion (188).

4. The oven as claimed in claim 3, wherein the oven door (32) comprises a thermal insulation plate (36); the thermal insulation plate (36) is engaged with a side of the door plate (34) which is opposite to the first surface (32a) and has the second surface (32b); a slot (362) is formed between each of the two pivot ears (346) and a bottom edge of the thermal insulation plate (36); the oven body (10) comprises a shield (20) located at an outer side of the bridge plate (18); when the oven door (32) pivots to the open position (P2), a top edge of the shield (20) is inserted into the

two slot (362)s.

5. The oven as claimed in claim 3, wherein each of the grooves (186) has a wall that is curved, the curved walls face toward the inner space (10a); when the oven door (32) pivots, the extending portions (342) are moved along the curved walls. 5
6. The oven as claimed in claim 1, wherein the oven body (10) comprises a rear plate (14); the frame (24) comprises two supporting sections (26), a first holding section (28), and a second holding section (30); each of the supporting sections (26) is connected to a bottom portion of the oven body (10) and extends from the front plate (12) to the rear plate (14); the first holding section (28) is connected to an end of each of the two supporting sections (26), and the second holding section (30) is connected to another end of each of the two supporting sections (26), the first holding section (28) has the abutted portion (28a). 10 15 20
7. The oven as claimed in claim 6, wherein the first holding section (28) comprises a grip, and a top surface of the grip forms the abutted portion (28a). 25
8. The oven as claimed in claim 6, wherein the first holding section (28) and the second holding section (30) are respectively located at a front side and a rear side of the oven body (10) and are symmetrical. 30
9. The oven as claimed in claim 1, wherein the abutted portion (28a) is located lower than the entrance (122). 35

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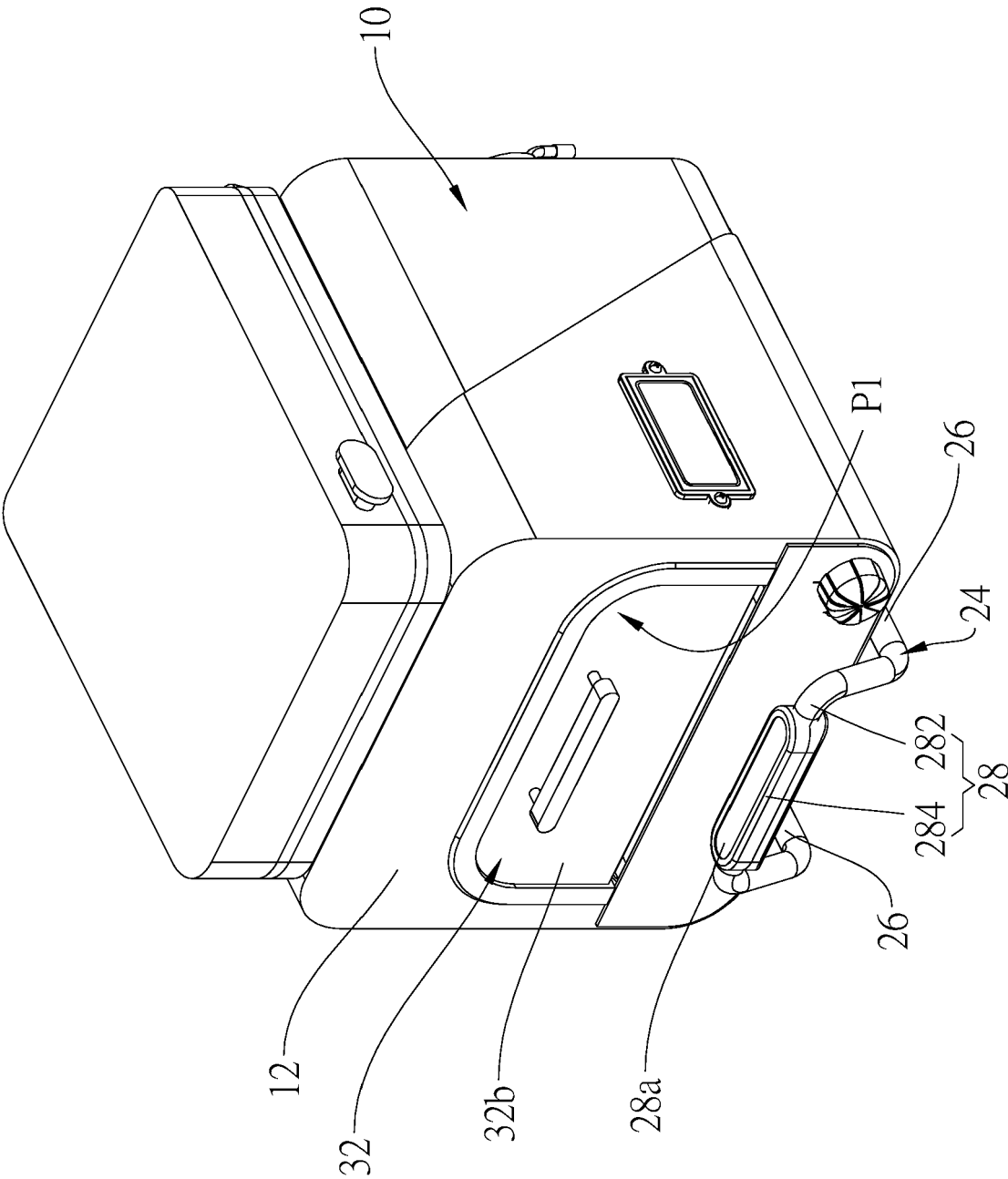


FIG.1

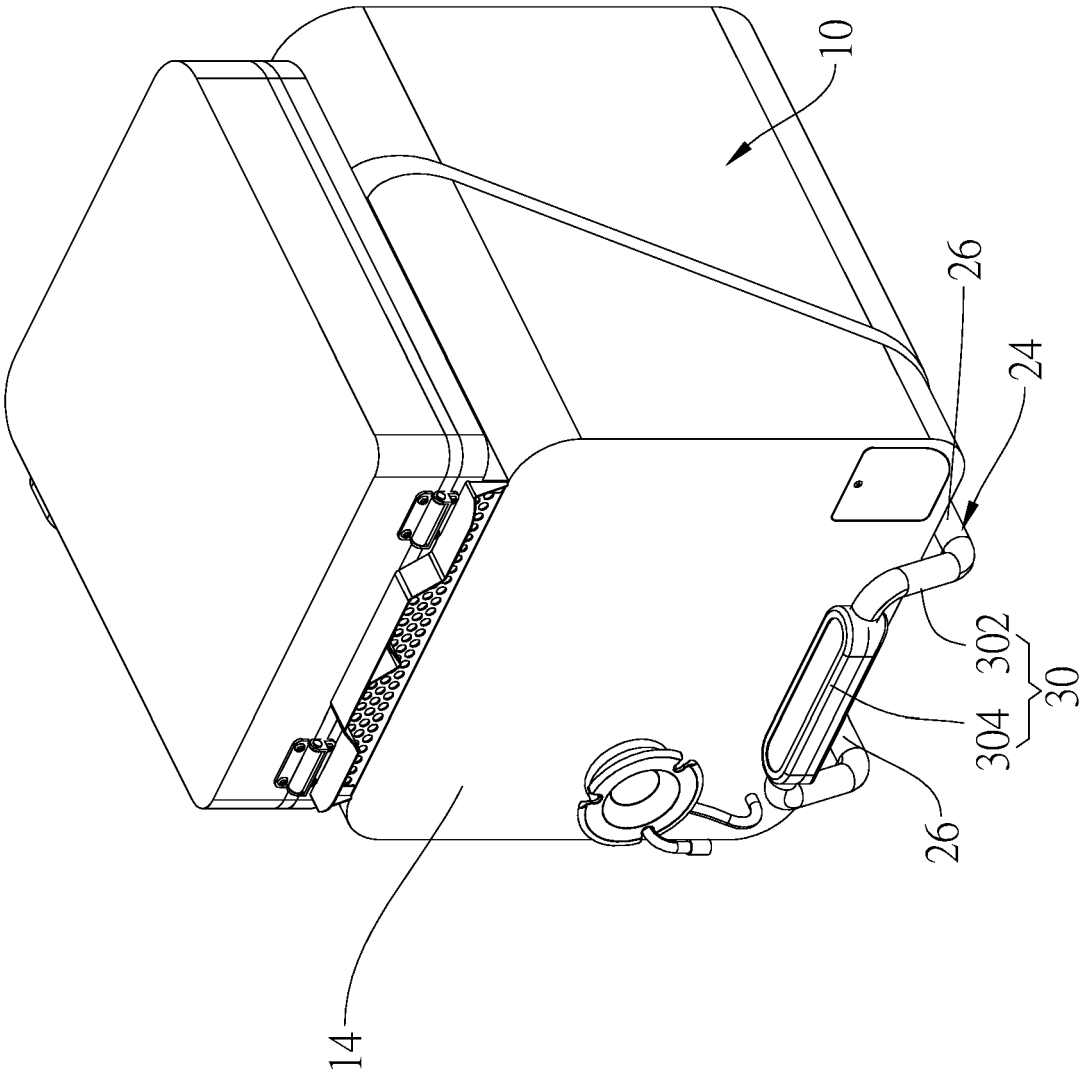


FIG. 2

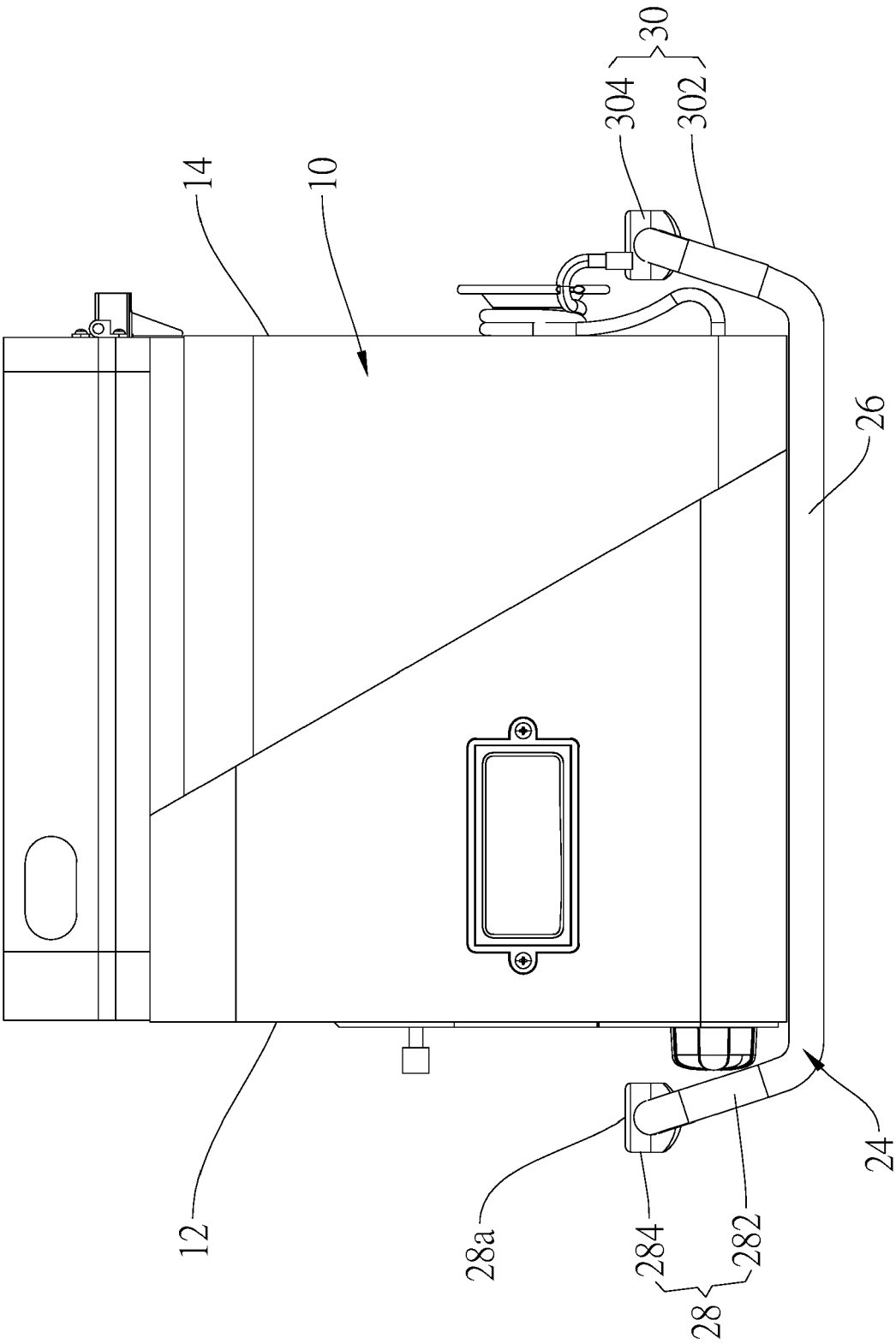


FIG.3

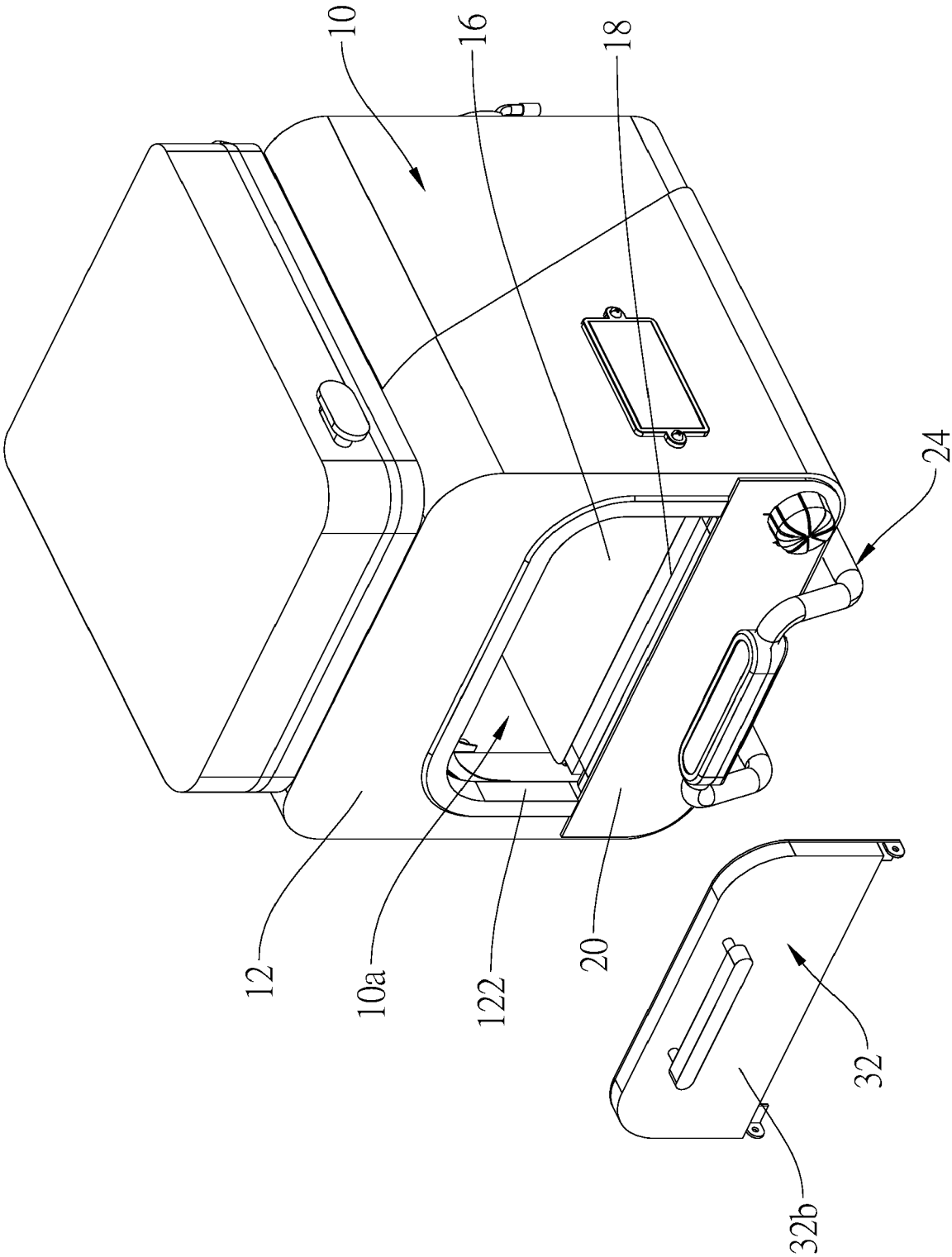


FIG.4

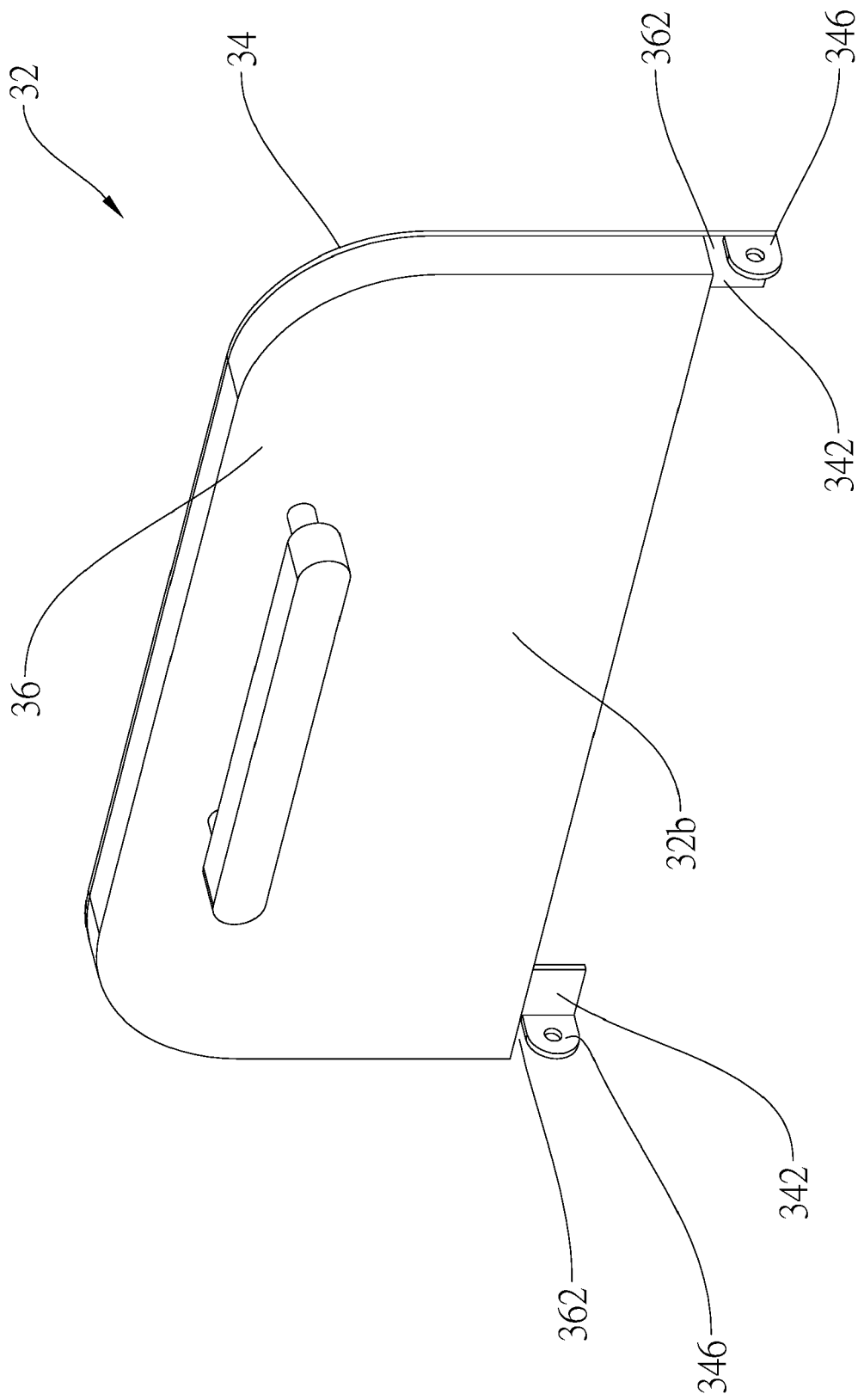


FIG.5

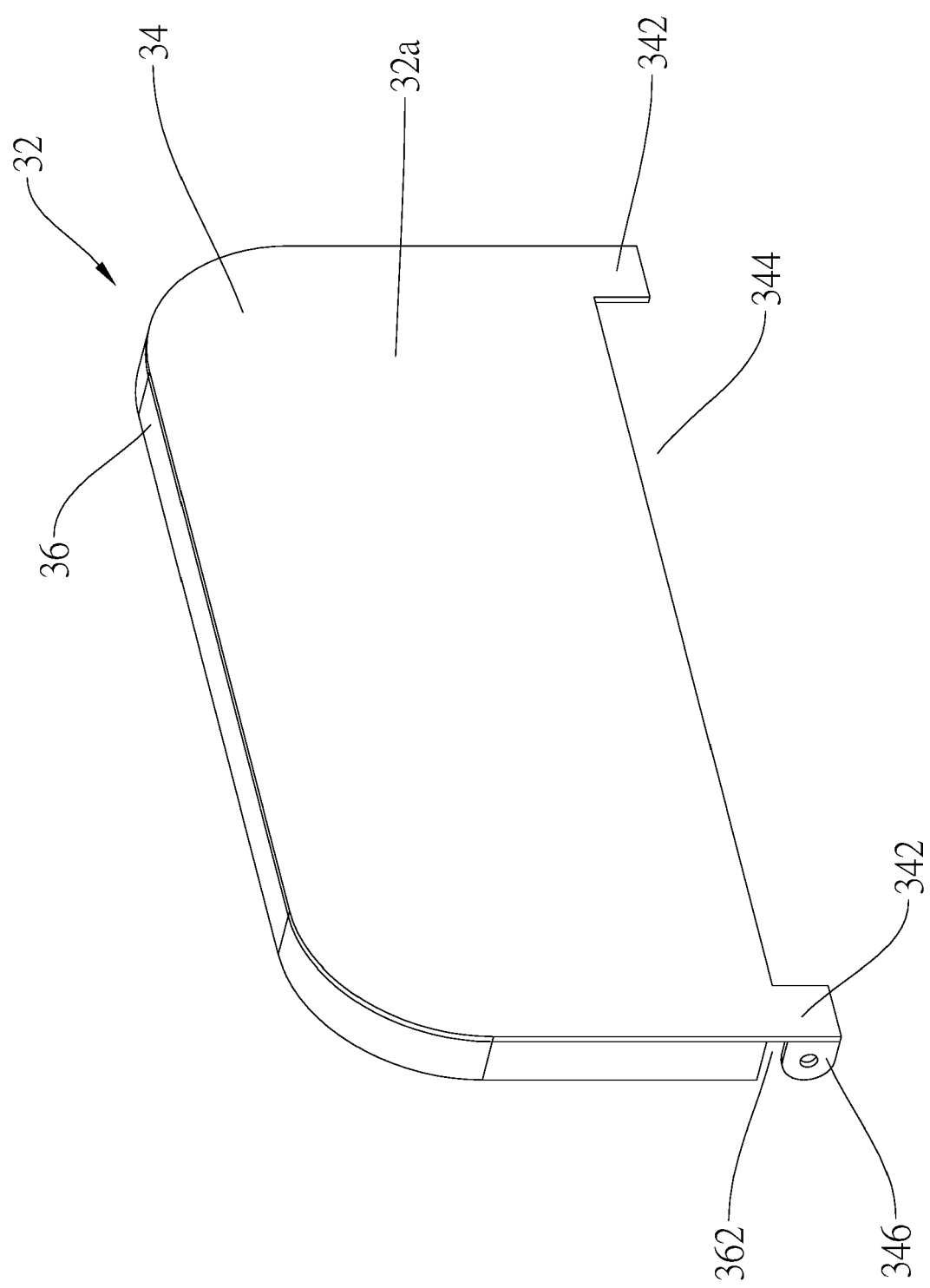


FIG. 6

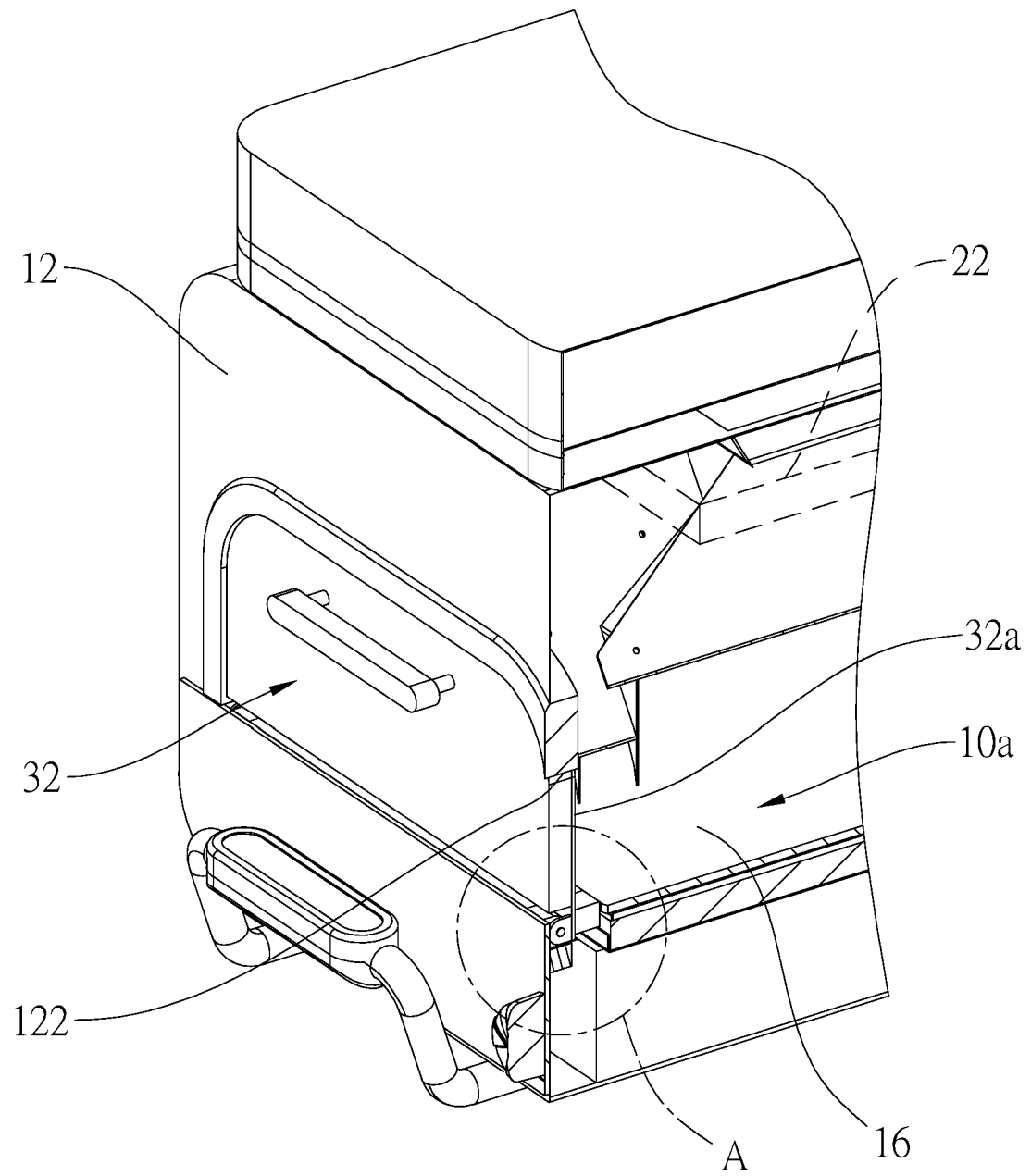


FIG.7

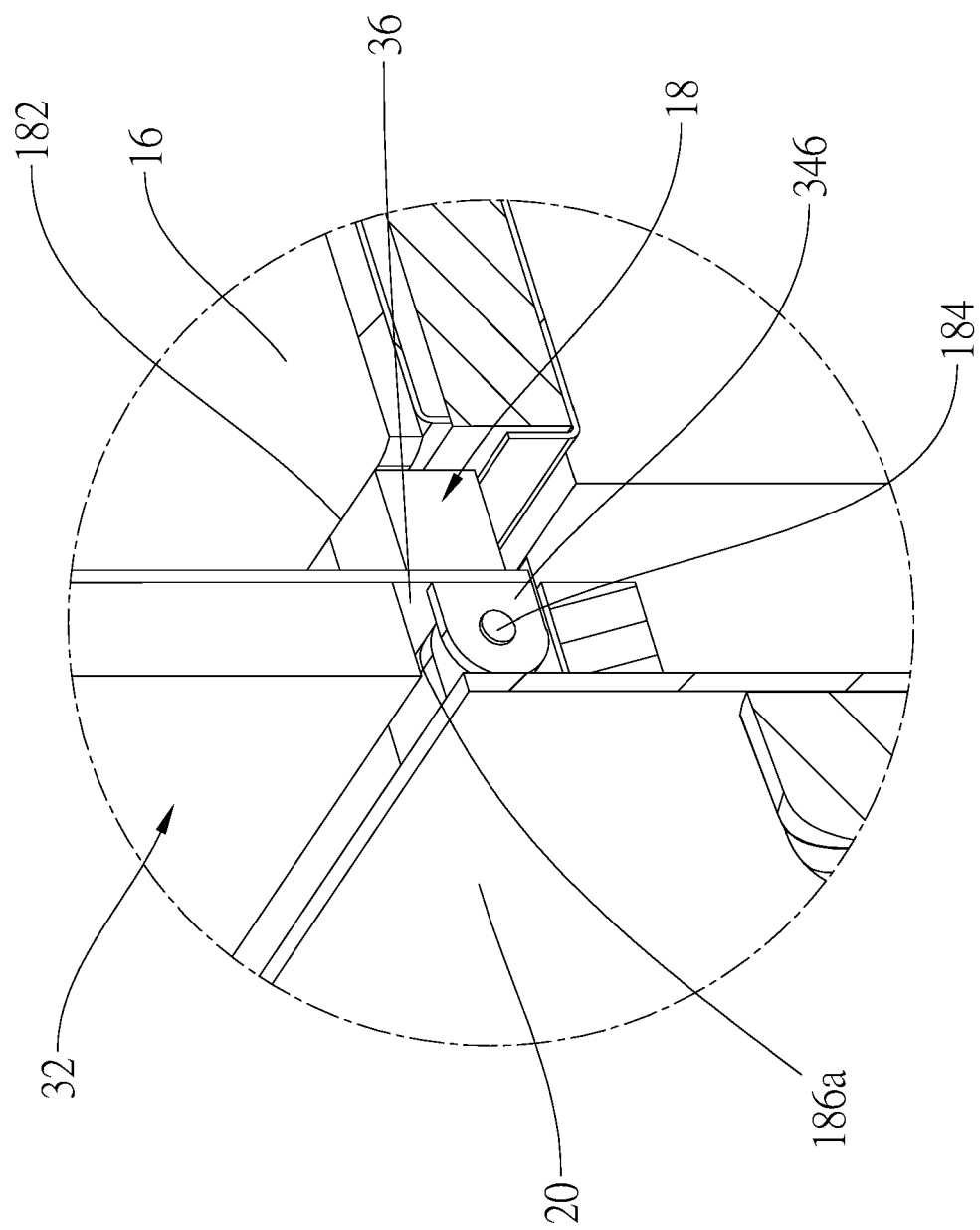


FIG. 8

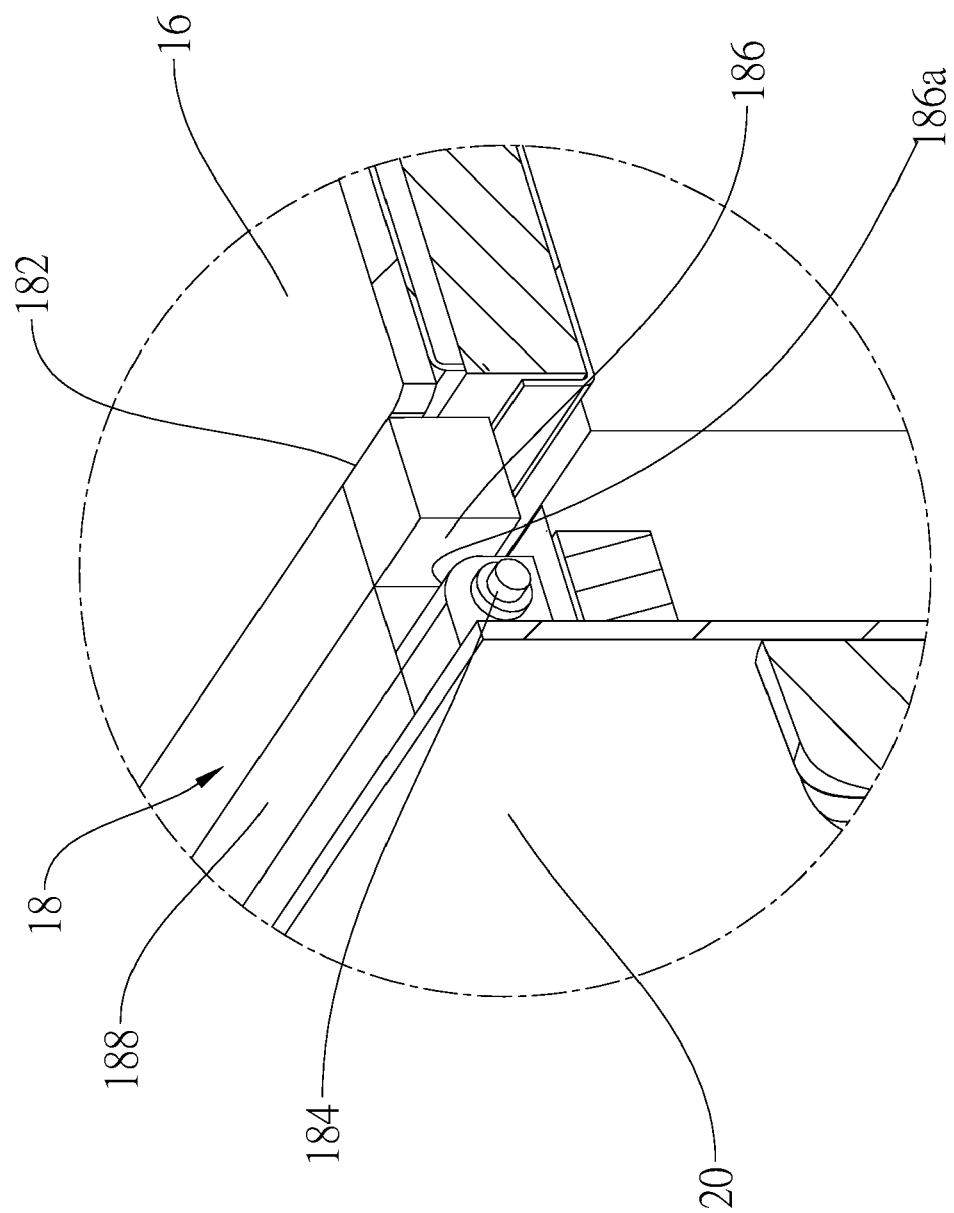


FIG.9

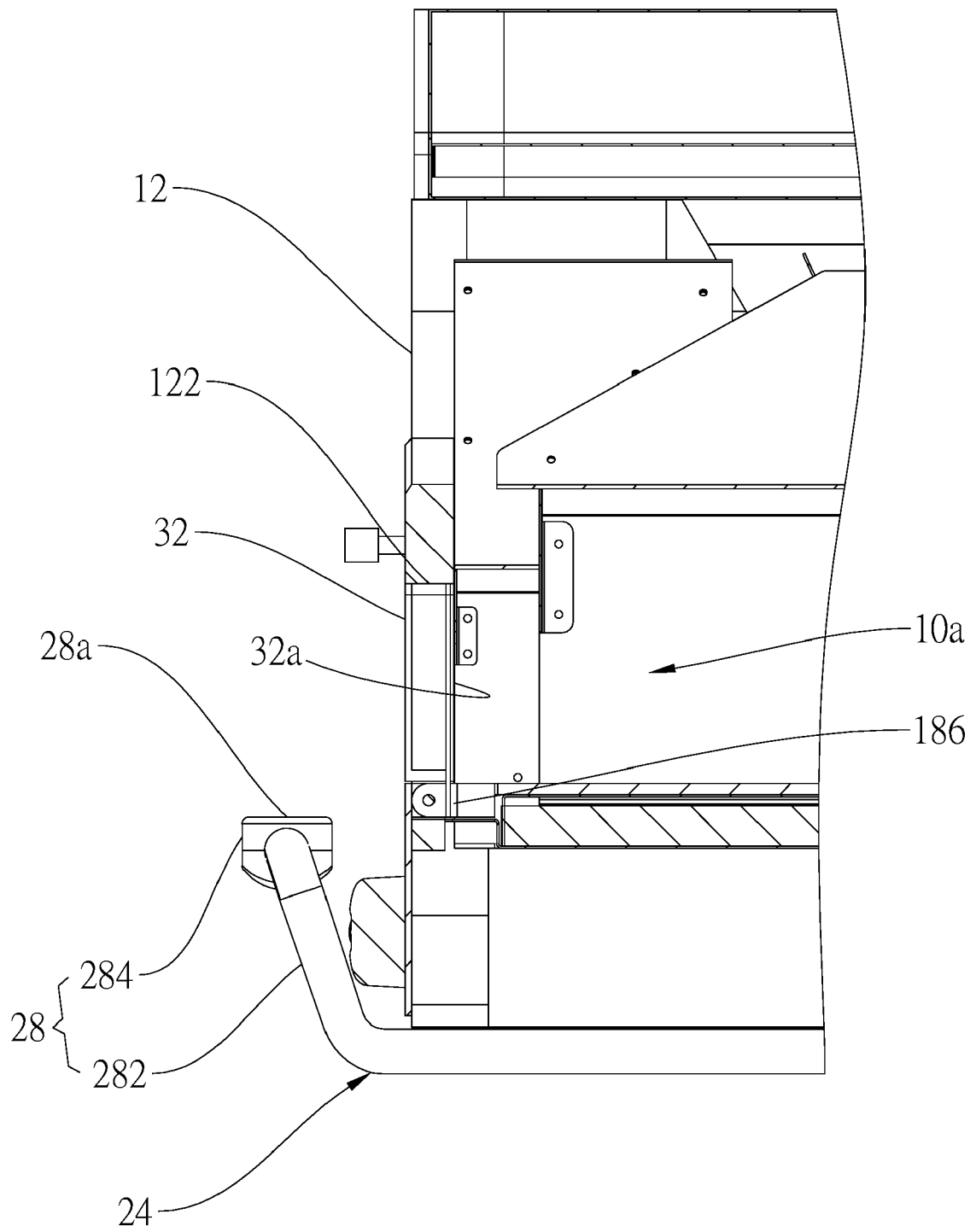


FIG.10

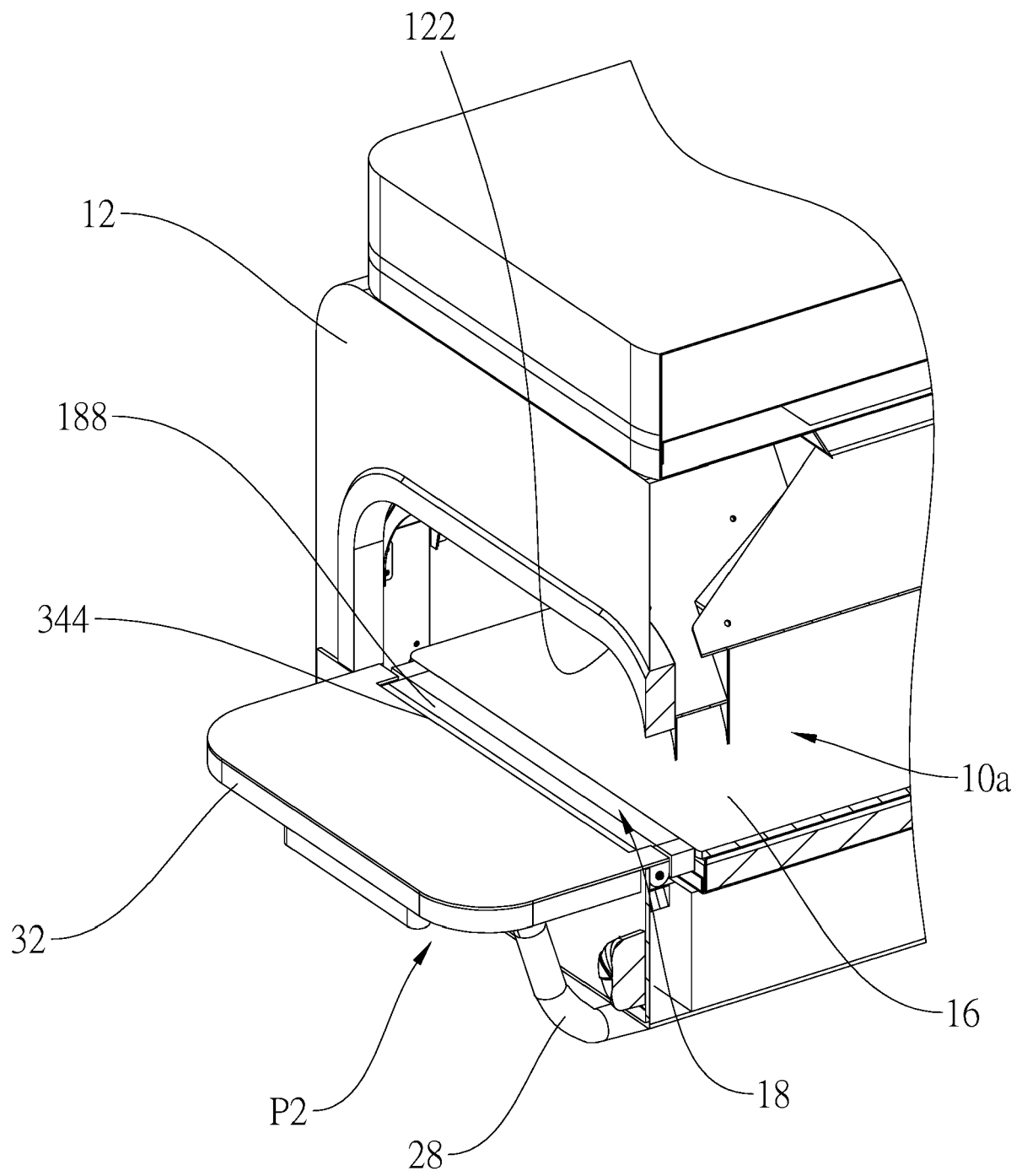


FIG.11

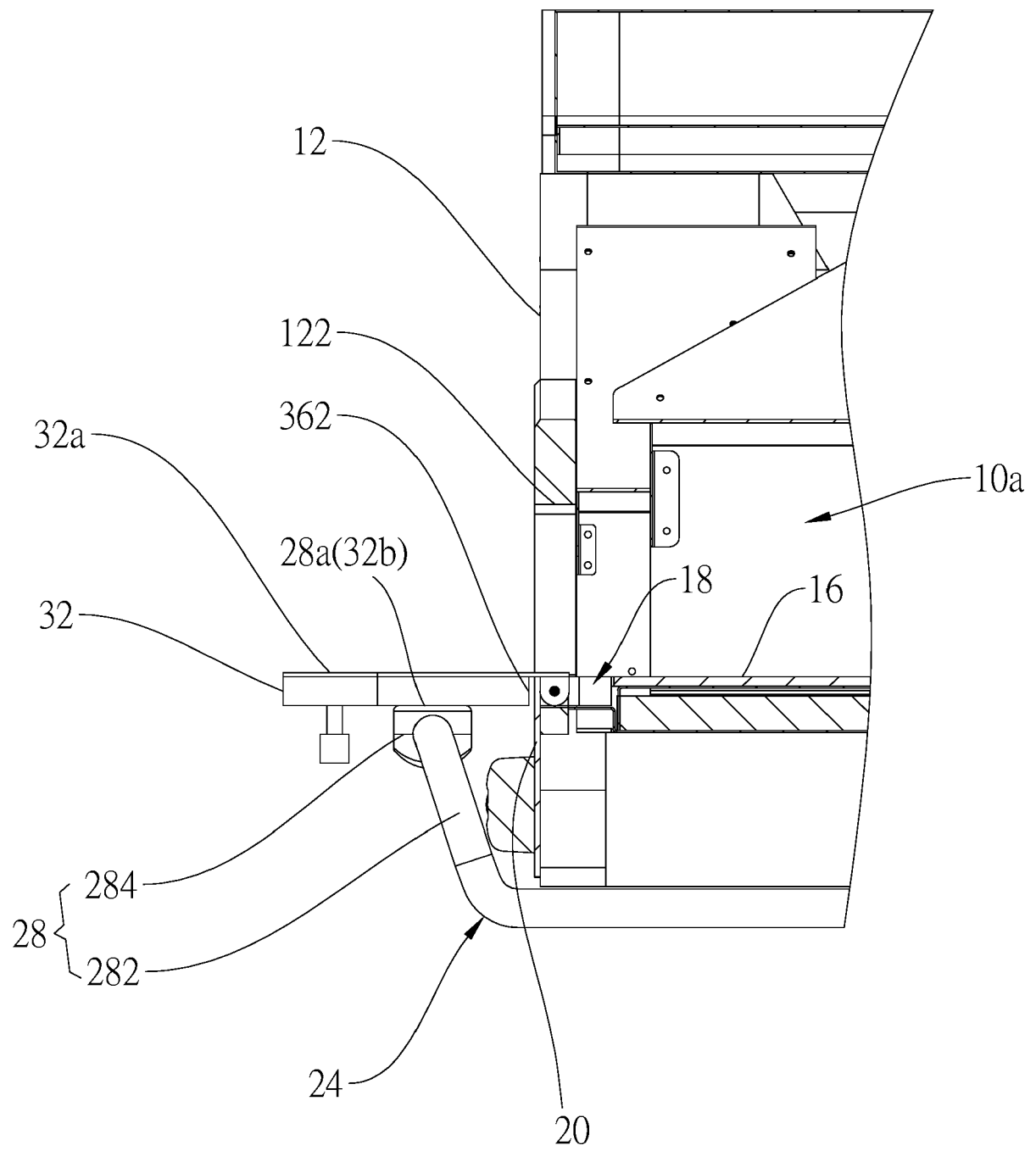


FIG.12



EUROPEAN SEARCH REPORT

Application Number

EP 22 16 6342

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DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 1 574 941 A (ELBERT SEXTON WILLIAM) 2 March 1926 (1926-03-02)	1, 2, 4, 5, 9	INV. F24C15/26
Y	* page 1, line 8 - page 1, line 11 * * figure 3 *	3	F24C15/02
Y	DE 75 19 943 U (OSTERMANN & FLÜS KG) 13 November 1975 (1975-11-13) * page 3, line 4; figure 1 *	3	
A	US 392 485 A (WILLARD J. ANDREWS) 6 November 1888 (1888-11-06) * figures 1, 2 *	1-9	
A	US 1 455 732 A (NICOLAUS FREDERICK G ET AL) 15 May 1923 (1923-05-15) * figure 1 *	4	
A	EP 3 644 746 A1 (BREVILLE R & D PTY LTD [AU]) 6 May 2020 (2020-05-06) * figure 6D *	4	
A	DE 20 2018 100021 U1 (RATIONAL AG [DE]) 16 January 2018 (2018-01-16) * figures 1-12 *	6-8	TECHNICAL FIELDS SEARCHED (IPC) F24C
The present search report has been drawn up for all claims			

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EPO FORM 1503 03.82 (P04C01)

Place of search

The Hague

Date of completion of the search

3 August 2022

Examiner

Jalal, Rashwan

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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03-08-2022

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 1574941 A	02-03-1926	NONE	
DE 7519943 U	13-11-1975	NONE	
US 392485 A	06-11-1888	NONE	
US 1455732 A	15-05-1923	NONE	
EP 3644746 A1	06-05-2020	AU 2018293913 A1	30-01-2020
		CN 110996668 A	10-04-2020
		CN 209489913 U	15-10-2019
		EP 3644746 A1	06-05-2020
		US 2021161151 A1	03-06-2021
		WO 2019000019 A1	03-01-2019
DE 202018100021 U1	16-01-2018	NONE	

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