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(54) **LIFTING EQUIPMENT FOR SCAFFOLDING, SCAFFOLDING COMPRISING SUCH LIFTING EQUIPMENT, AND METHOD FOR INSTALLING A SCAFFOLDING**

(57) Lifting equipment (12) for scaffolding (14) comprises a lower structure (16) and a rear structure (18) arranged on the lower structure (16), and a platform (20) arranged on the rear structure (18). The lifting equipment (12) comprises a lifting mechanism (22) suitable for moving the platform (20) along the rear structure. The platform (20) comprises at least one front door (24, 26) opposite the rear structure (18), and side doors (28, 30).

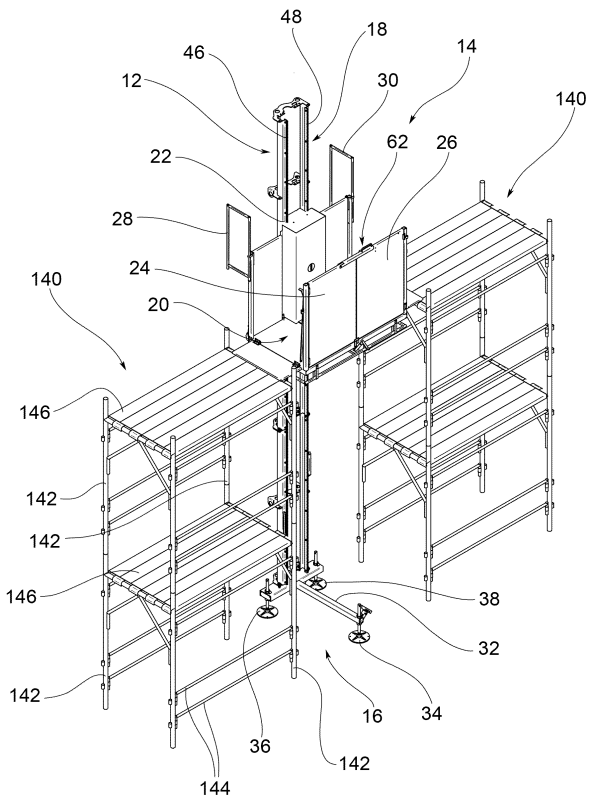

FIG.1

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Description

FIELD OF APPLICATION

[0001] The present invention relates to lifting equipment for scaffolding and scaffolding comprising such lifting equipment.

PRIOR ART

[0002] As is well known, scaffolding is a temporary type of reticulated structure that is used, for example, in building for the construction or maintenance of building works. In any case, the reference to the building field is not limiting, because the scaffolding finds further uses, for example, in the civil engineering field, as seems self-evident to a person skilled in the art.

[0003] The step of installing the scaffolding is a delicate operation because the various components must be positioned one after the other by workers situated on the very scaffolding being built.

[0004] For example, in the case of scaffolding made with frames and ledgers, once the ground level floor has been created, a worker must climb onto the first work floor in order to be able to install frames and ledgers of subsequent floors. At this stage the upper floor guardrails are not yet installed, and the components of the scaffolding are thus passed to the worker via a rope and pulley system, or by ropes moved using electric winches.

[0005] Although this installation system is widely used, it is not without drawbacks.

[0006] First, it is by no means a simple and safe operation to conduct, especially when one is twenty or thirty meters up from the ground. In fact, the components of the scaffolding must be lifted manually or by means of winches, but are found to be suspended in the air for a long time.

[0007] Second, the transport of the components of the scaffolding from the ground to the destination floor is an operation that occupies a significant amount of space in the front part of the scaffolding. In the zone in front of the scaffolding, the materials to be transported must be arranged, and the transported material must be properly attached to the rope in order to be lifted. It is therefore necessary to arrange a safe zone in the front part of the scaffolding where these operations will be carried out. This problem is particularly acute in the case wherein the scaffolding is to be carried out in an inaccessible place or with confined spaces, such as in the center of a city.

DISCLOSURE OF THE INVENTION

[0008] The need to solve at least partly the drawbacks and limitations mentioned with reference to the prior art is therefore felt.

[0009] Therefore, there is a need for lifting equipment for scaffolding which makes it possible to operate with greater safety than is the case with the equipment used in the prior art.

[0010] In addition, there is a need for lifting equipment that is easier to use for the workers.

[0011] Furthermore, there is a need for lifting equipment which makes it possible to avoid occupying further space in the zone in front of the scaffolding during the installation operations.

[0012] These requirements are met at least in part by lifting equipment according to claim 1, by scaffolding according to claim 16, and by a method for setting up scaffolding according to claim 18.

DESCRIPTION OF THE DRAWINGS

[0013] Further features and advantages of the present invention will become more apparent from the following detailed description of preferred, non-limiting embodiments thereof, wherein:

- Fig. 1 is a schematic perspective view of a scaffolding according to a possible embodiment;
- Fig. 2 is a schematic front view of a scaffolding according to a possible embodiment;
- Fig. 3 is a schematic plan view from above of a scaffolding according to a possible embodiment;
- Fig. 4 is a schematic front view of lifting equipment according to a possible embodiment;
- Fig. 5 is a schematic side view of lifting equipment according to a possible embodiment;
- Fig. 6 is a plan view from above of lifting equipment according to a possible embodiment;
- Fig. 7 is a schematic perspective view of lifting equipment according to a possible embodiment in a particular use configuration;
- Fig. 8 is a schematic perspective view of lifting equipment according to a possible embodiment;
- Fig. 9 is a schematic front perspective view of a component of lifting equipment according to a possible embodiment;
- Fig. 10-12 are schematic perspective views of some lifting equipment and scaffolding components; and
- Fig. 13-19 are schematic perspective views of a possible sequence of steps related to making a scaffolding.

[0014] Elements or parts of elements common to the embodiments described hereinafter will be indicated with the same numerical references.

DETAILED DESCRIPTION

[0015] Fig. 1 shows lifting equipment for scaffolding 14 which is indicated as a whole by the reference sign 12.

[0016] The lifting equipment 12 comprises a lower structure 16 and a rear structure 18 arranged on the lower structure 16. In other words, the lower structure 16 acts as a support base for the rear structure 18.

[0017] In addition, the lifting equipment 12 also com-

prises a platform 20 arranged on the rear structure 18. The platform 20 is moved along the rear structure 18 by a lifting mechanism 22. At least one front door 24, 26 opposite the rear structure 18 and side doors 28, 30 are arranged on the platform 20.

[0018] According to a possible embodiment, the rear structure 18 may be of the modular type and comprise rear modules 19. The rear modules 19 may in turn comprise two parallel beams 192, 194 joined by at least two end flanges 196, 198 arranged for coupling with other rear modules 19. In a way that is self-evident to a person skilled in the art, the coupling between two end flanges may be achieved by means of a bolted connection.

[0019] However, further embodiments are possible for the rear modules 19; for example, they may comprise a rigid box-like structure at the ends of which means for coupling with other rear modules 19 may be arranged.

[0020] The lower structure 16 may comprise a T-frame, at the ends of which a front foot 34 and two rear feet 36, 38 are placed.

[0021] According to alternative embodiments, the lower structure 16 may comprise a frame, for example with four sides and four support feet. In any case, a person skilled in the art may, according to specific needs, construct a lower structure 16 on an ad hoc basis.

[0022] The lifting mechanism 22 is arranged between the rear structure 18 and the platform 20.

[0023] According to a possible embodiment, the drive unit 40 may be arranged on the platform 20. The drive unit 40 may comprise at least one pinion 42, 44. The at least one pinion 42, 44 is then controlled in rotation by the drive unit 40. The lifting mechanism 22 may further comprise at least one gear rack 46, 48 arranged on the rear structure 18. In the case wherein the rear modules 19 of the rear structure 18 are made with beams 192, 194, the at least one gear rack 46, 48 is arranged on at least one of the beams 192, 194.

[0024] Advantageously, in the case wherein two pinions 42, 44 and two gear racks 46, 48 are used, each of the gear racks 46, 48 is arranged on a corresponding beam 192, 194.

[0025] Obviously, in the case wherein the rear structure 18 comprises a plurality of rear modules 19, the gear racks 46, 48 of a first module 19 will be contiguous with respect to the gear racks 46 48 of a second rear module 19, so that there is seamless continuity in the transmission of motion between the pinions 42, 44 and the gear racks 46, 48 of a first module 19 and a second module 19 contiguous to the previous one.

[0026] In a manner that is self-evident to a person skilled in the art, the engagement between the pinions 42, 44 and the gear racks 46, 48 is ensured by interconnection means 50 suitable for maintaining the mutual position between the drive means and the rear structure 18.

[0027] According to a possible embodiment, the drive unit may be of the electromechanical type.

[0028] Advantageously, as seen in Fig. 9, the lifting mechanism 22 may comprise a parachute brake 52. According to a possible embodiment, the parachute brake 52 may comprise at least one brake pinion 54, 56 engaged with at least one of the gear racks 46, 48 already used for the pinions 42, 44 of the drive unit 40. Advantageously, the parachute brake 52 may comprise two brake pinions 54. 56 in engagement with two gear racks 46, 48.

[0029] According to alternative embodiments, the parachute brake 52 may take advantage of dedicated gear racks placed on the rear structure 18.

[0030] As may be seen in the embodiment shown in Fig. 3, the lifting equipment may comprise two front doors 24, 26. The front doors 24 26 may rotate according to a rotation axis that is substantially vertical, and therefore substantially parallel to the rear structure 18.

[0031] According to a possible embodiment, the front doors 24, 26 may be arranged by means of hinges 58, 60 at the front ends of the platform 20. In this way, it is possible to open the front doors 24, 26 with a rotation of their non-hinged end, leaving access to the platform 20 free.

[0032] As seen in Fig. 7 and 8, the at least one front door may comprise a first safety closure 61 suitable for preventing the at least one front door from opening when the platform is at a height other than the ground floor. This prevents a distracted worker from inadvertently opening the front doors, for example, at a height greater than 30-40 cm from the ground.

[0033] As may be seen in Fig. 1, at least one of the front doors 24, 26 may comprise a second safety closure 62 to ensure that the front doors 24, 26 in the closed condition are locked and unlocked at the request of the worker. The mechanism used for the second safety closure 62 may be of the rotating type with a first end 622 of a bar 624 hinged on one of the front doors 24 and with a second end 626, which may couple to the upper edge of the other front door 26 via its shape.

[0034] However, further forms of use of the second safety closure 62 are possible which are self-evident to a person skilled in the art.

[0035] According to a possible embodiment, the platform 20 may comprise a safety sensor 64 suitable for detecting the locking of the at least one front door 24 26 and to send this information to the drive unit 40. In this way, it is possible to allow the operation of the drive unit 40 and thus the movement of the platform 20 along the rear structure 18 only when the at least one front door 24 26 is in the locked condition.

[0036] In the embodiment shown in Fig. 4, the safety sensor 64 is applied to a configuration of lifting equipment 12 provided with two front doors 24, 26. In this case, the safety sensor is a lever device that interacts with a switch. In any case, the technical aspects provided by such a safety sensor 64 will not be addressed.

[0037] According to a possible embodiment, the side doors 28, 30 may be pivoted on a rear parapet 66 of the platform 20. One such embodiment is shown, for exam-

ple, in Fig. 1 and 7 wherein the side doors 28, 30 are seen in the open position.

[0038] The side doors 28, 30 may be suitable for rotating between a closed position and an open position according to an axis substantially perpendicular to the development of said rear structure 18.

[0039] According to a possible embodiment, the lifting equipment 12 may comprise at least one side deck 68, 70 arranged on side edges of the platform 20. As may be seen in Fig. 7 and 8, the at least one side deck 68, 70 is arranged with deck hinges 682; 702, so as to assume a first position in which it is substantially perpendicular to the platform 20 and a second position in which it protrudes from the platform 20 to make an extension of said platform 20.

[0040] Fig. 1, 2 and 3 show schematically a possible embodiment of a scaffolding 14 comprising lifting equipment 12 as just described.

[0041] As may be seen, the scaffolding 14 comprises a plurality of scaffolding modules 140, which may be placed side by side. In this discussion, the term "scaffolding module 140" means a scaffolding portion from ground to sky that may be used independently. In other words, a scaffolding module 140 comprises at least two frames 142, the necessary competitors 144 and at least one work floor 146.

[0042] The lifting equipment 12 is therefore suitable for being integrated into a scaffolding 14 in substitution for a scaffolding module 140.

[0043] Advantageously, the footprint in plan of the lifting equipment 12 may be substantially the same as that of a scaffolding module 140.

[0044] Advantageously, the scaffolding 14 may have a fixed pitch with a span of 1.8 meters or 2.5 meters.

[0045] As may be seen in Fig. 1, the at least one deck 68, 70 may be suitable for cooperating with a work floor 146 of an adjacent scaffolding module 140 so as to create a continuity of walkable surface between the platform 20 and the work floor 146.

[0046] According to a possible embodiment, the lifting equipment may be used for setting up the scaffolding 14, i.e., installing it. Once the scaffolding modules 140 adjacent to the lifting equipment 12 have been installed, the lifting equipment 12 may be removed and, for example, replaced with a scaffolding module.

[0047] In alternative embodiments, the lifting equipment 12 may be maintained in the scaffolding 14 and may be used for the transport of people between the various levels of the scaffolding or for the transport of the material needed by the workers.

[0048] Fig. 13-15 show a possible sequence of steps relating to a method for setting up a scaffolding 14 according to the present invention.

[0049] The method comprises the steps of:

(a) positioning lifting equipment 12 as just described;
(b) creating the entire length of the scaffolding 14 fixed to the ground floor;
(c) loading the frames 142 and the relative ledgers 144 onto the platform 20 positioned on the ground floor;
(d) lifting and unloading the frames 142 and the relative ledgers 144 positioned on the platform 20 to the floor;
(e) creating the floor of the scaffolding 14;
(f) moving the platform 20 to the ground floor for loading the work floors 146; and
(g) lifting, unloading, and installing the work floors 146 on the floor.

[0050] With reference to Fig. 13, after positioning the lifting equipment 12 and positioning the ground floor of the scaffolding 14, a fixed-pitch anchor 150 may be positioned (not seen in Fig. 13, but it is possible to see that of the next floor in Fig. 16) . The fixed-pitch anchor 150 is used to maintain the correct distance between the two scaffolding modules 140 between which the lifting equipment 12 is arranged.

[0051] According to a possible embodiment, a rack 152, which may be seen in Fig. 10, may be arranged on the platform 20. The rack may, for example, be a sheet metal box element on which holes are arranged in which the frames 142 may be inserted. According to a possible embodiment, the rack 152 may comprise twelve holes so as to transport twelve frames. At a time.

[0052] The at least one front door 24, 26 is then closed and lifted to the next floor (step (d)).

[0053] As may be seen in Fig. 15, the first floor is then made with frames and ledgers. In order to unload the material onto the floor, the side doors 28, 30 are opened.

[0054] Obviously, in order to create a floor of the scaffolding 14, one or more repetitions of steps (c) and (d) may be necessary, as will appear self-evident to a person skilled in the art.

[0055] A sequence similar to the previous one is then carried out for loading the work floors 146 on the platform 20 and installing them on the floor.

[0056] As seen in the example in Fig. 11, it is possible to load, for example, up to twenty working floor 146 using a frame as a rear support.

[0057] According to a possible embodiment, a step may be provided wherein a rear module 19 of the lifting equipment 12 is loaded onto the platform 20 so as to be able to extend the course of said scaffolding.

[0058] The repetition of steps (c) - (f) is then continued until all the floors of the scaffolding have been created.

[0059] With reference to Fig. 18, the scaffolding doors 148 are then loaded to close access to the lifting equipment compartment when the lifting equipment is not on the floor.

[0060] As may be seen in Fig. 12, the doors may be loaded in a similar way to the work floors with door hinges 149 arranged in the front.

[0061] Thus, the advantages that may be achieved with lifting equipment 12 and scaffolding 14 according to the present invention are now apparent.

[0062] First, lifting equipment 12 has been provided which allows the components of the scaffolding 14 to be transported safely and effectively during the construction thereof.

[0063] For example, the platform 20 may be arranged with racks (not shown in the accompanying figures) in which the scaffolding frames may be positioned.

[0064] Second, lifting equipment 12 has been provided which allows staff to load the necessary material onto the platform on the ground and transport it easily to the floor of the scaffolding where it is to be unloaded.

[0065] Furthermore, lifting equipment has been provided which allows it to occupy substantially the same footprint in plan, i.e., on the ground, as a scaffolding module, without the need for additional space in the front position with respect to said scaffolding.

[0066] Furthermore, the lifting equipment according to the present invention may be kept inside the scaffolding, or disassembled and replaced with a scaffolding module, according to specific requirements.

[0067] A scaffolding has also been provided wherein the transport of material between one floor and the other of the scaffolding is safer and easier compared to scaffolding of the prior art.

[0068] A person skilled in the art will be able to make modifications to the embodiments described above and/or substitute described elements with equivalent elements, in order to satisfy particular requirements, without departing from the scope of the accompanying claims.

Claims

1. Lifting equipment (12) for scaffolding (14) comprising a lower structure (16) and a rear structure (18) arranged on said lower structure (16), and a platform (20) arranged on said rear structure (18);
said lifting equipment (12) comprising a lifting mechanism (22) suitable for moving said platform (20) along said rear structure; said platform (20) comprising at least one front door (24,26) which is opposite with respect to said rear structure (18), and side doors (28,30).

2. Lifting equipment (12) according to the preceding claim, **characterized in that** said rear structure (18) is of a modular type, and comprises rear modules (19) comprising at least one beam (192,194) and at least two end flanges (196,198) arranged for coupling between the rear modules (19).

3. Lifting equipment (12) according to the preceding claim, **characterized in that** said rear module (19) comprises two beams (192,194) and two end flanges (196,198) arranged for coupling between the rear modules (19) .

4. Lifting equipment (12) according to any one of the preceding claims, **characterized in that** said lower structure (16) comprises a T-frame at the ends of which a front foot (34) and two rear feet (36,38) are placed.

5. Lifting equipment (12) according to any one of the preceding claims, **characterized in that** said lifting mechanism (22) comprises a drive unit (40) arranged with at least one pinion (42,44) and at least one gear rack (46,48) arranged on said rear structure (18); said at least one pinion (42,44) being in an engagement condition with said at least one gear rack (192,194).

6. Lifting equipment (12) according to the preceding claim, **characterized in that** said at least one gear rack (46,48) of two rear modules (19) which in assembled conditions are contiguous, are seamlessly consecutive to each other for the engagement of said at least one pinion (42,44) of the drive unit (40).

7. Lifting equipment (12) according to the preceding claim, **characterized in that** said drive unit (40) of said lifting mechanism (22) is arranged with two pinions (42,44) and each of said two beams (192 294) comprises a gear rack (192,194).

8. Lifting equipment (12) according to any one of the preceding claims, **characterized in that** said drive unit (40) is of the electromechanical type.

9. Lifting equipment (12) according to any one of the preceding claims, **characterized in that** the lifting mechanism (22) comprises a parachute brake (52) arranged with at least one brake pinion (54,56) in engagement with at least one gear rack (46,48).

10. Lifting equipment (12) according to any one of the present claims, **characterized in that** it comprises two front doors (24,26) which may rotate according to a substantially vertical rotation axis, and therefore substantially parallel to the rear structure (18).

11. Lifting equipment (12) according to any one of the preceding claims, **characterized in that** said front doors (24,26) are arranged by means of hinges (58,60) at the front ends of the platform (20).

12. Lifting equipment (12) according to any one of the preceding claims, **characterized in that** said side doors (28,30) are hinged on a rear parapet (66) of said platform (20).

13. Lifting equipment (12) according to the preceding claim, **characterized in that** said side walls (28,30) are adapted to rotate between a closed position and an open position according to an axis substantially perpendicular to the extension of said rear structure

(18).

14. Lifting equipment (12) according to any one of the preceding claims, **characterized in that** it comprises at least one side deck (68,70) arranged on side edges of said platform (20); said at least one side deck (68,70) being arranged with deck hinges (682;702), so as to assume a first position in which it is substantially perpendicular to said platform (20) and a second position in which it protrudes from said platform (20) to make an extension of said platform (20) itself.

15. Lifting equipment (12) according to any one of the preceding claims, **characterized in that** it has a footprint in plan of about 1.57 m in its front portion and 1.3 m in its depth portion.

16. Scaffolding (14) comprising lifting equipment (12) according to any one of the preceding claims.

17. Scaffolding (14) according to the preceding claim, wherein said scaffolding (14) is fixed pitch with a span of 1.8 meters or 2.5 meters.

18. Scaffolding (14) according to any one of claims 16-17, **characterized in that** it comprises a plurality of scaffolding modules (140) wherein the lifting equipment (12) has a footprint substantially equal to the scaffolding module (140).

19. Method for installing a scaffolding (14) comprising the steps of:

(a) positioning lifting equipment (12) according to any one of claims 1-15;
(b) creating the entire length of the scaffolding (14) fixed to the ground floor;
(c) loading frames (142) and the relative ledgers (144) on the platform (20) positioned on the ground floor;
(d) lifting and unloading the frames (142) and the relative ledgers (144) positioned on the platform (20) to the floor;
(e) creating the floor of the scaffolding (14);
(f) moving the platform (20) to the ground floor for loading the work floors (146); and
(g) lifting, unloading, and installing the work floors (146) on the floor.

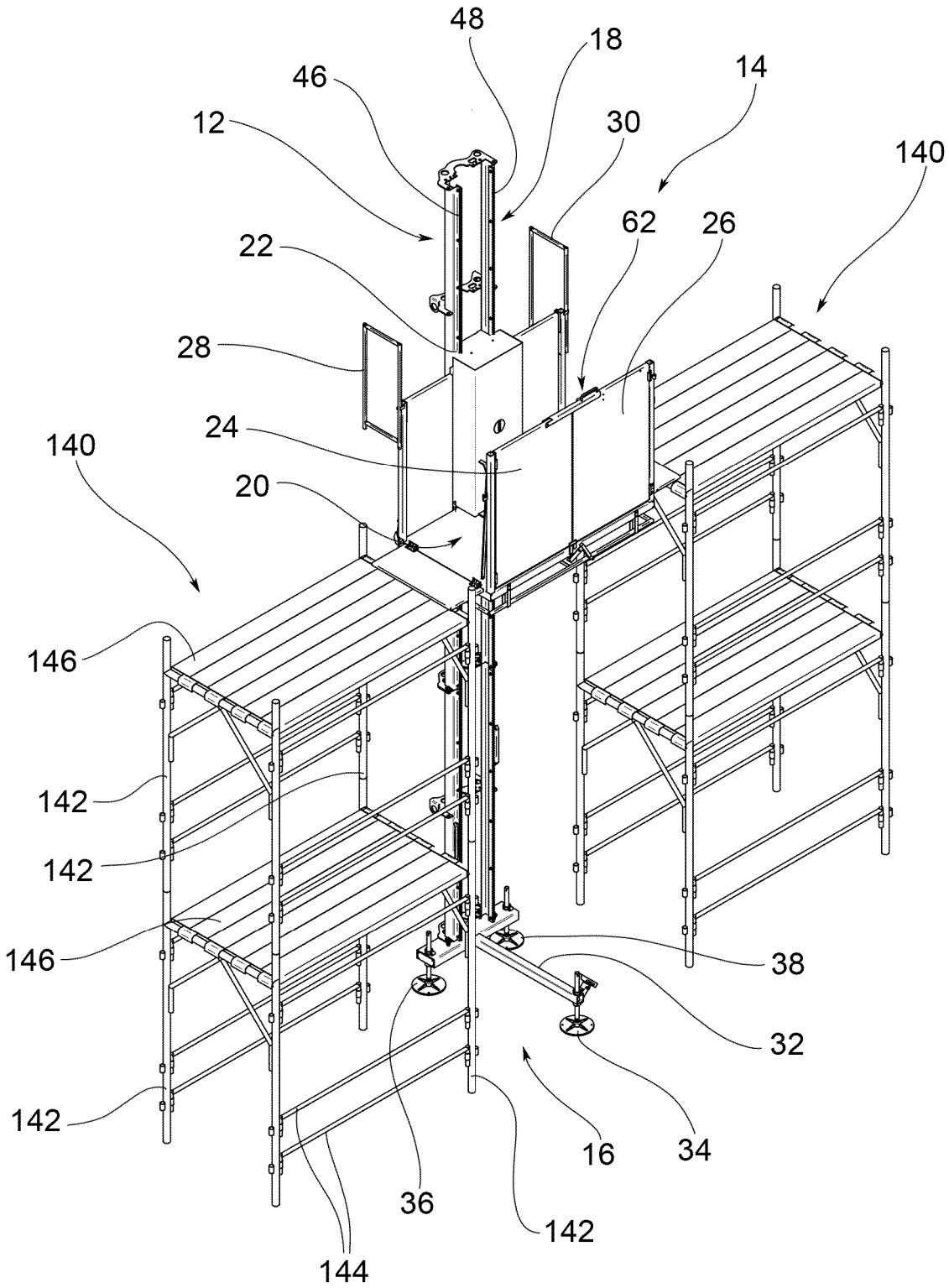
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FIG.1

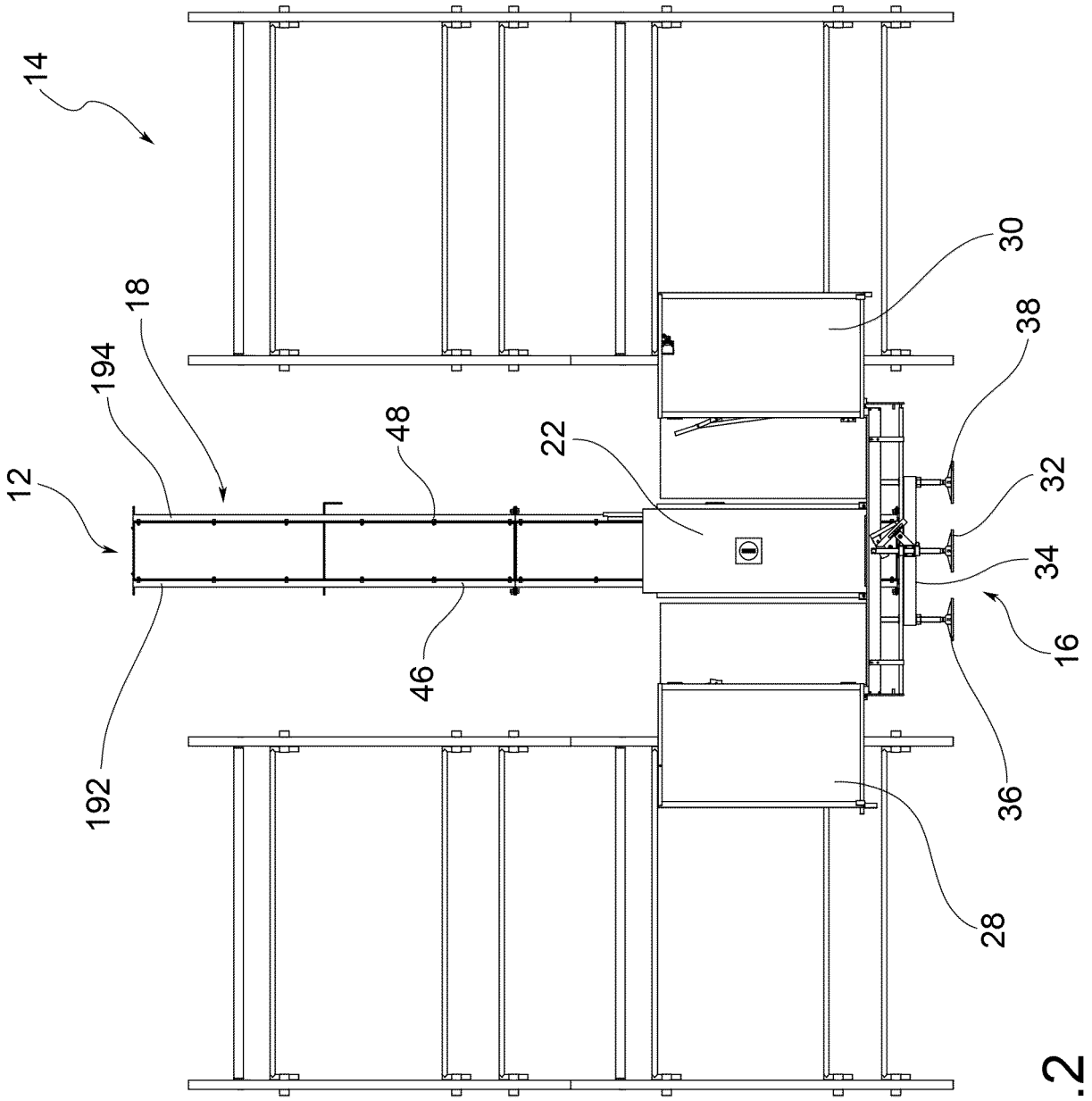

FIG.2

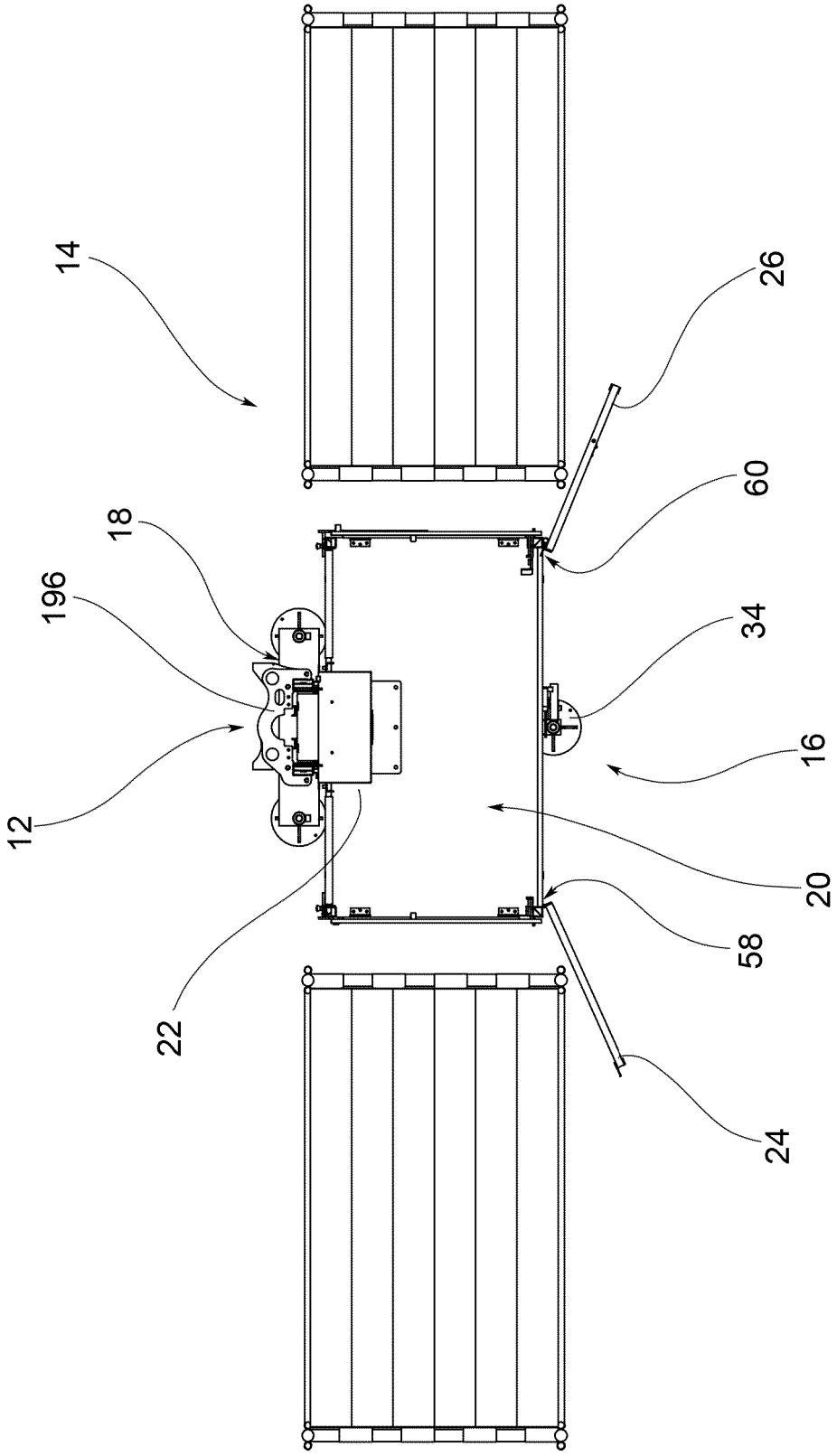

FIG.3

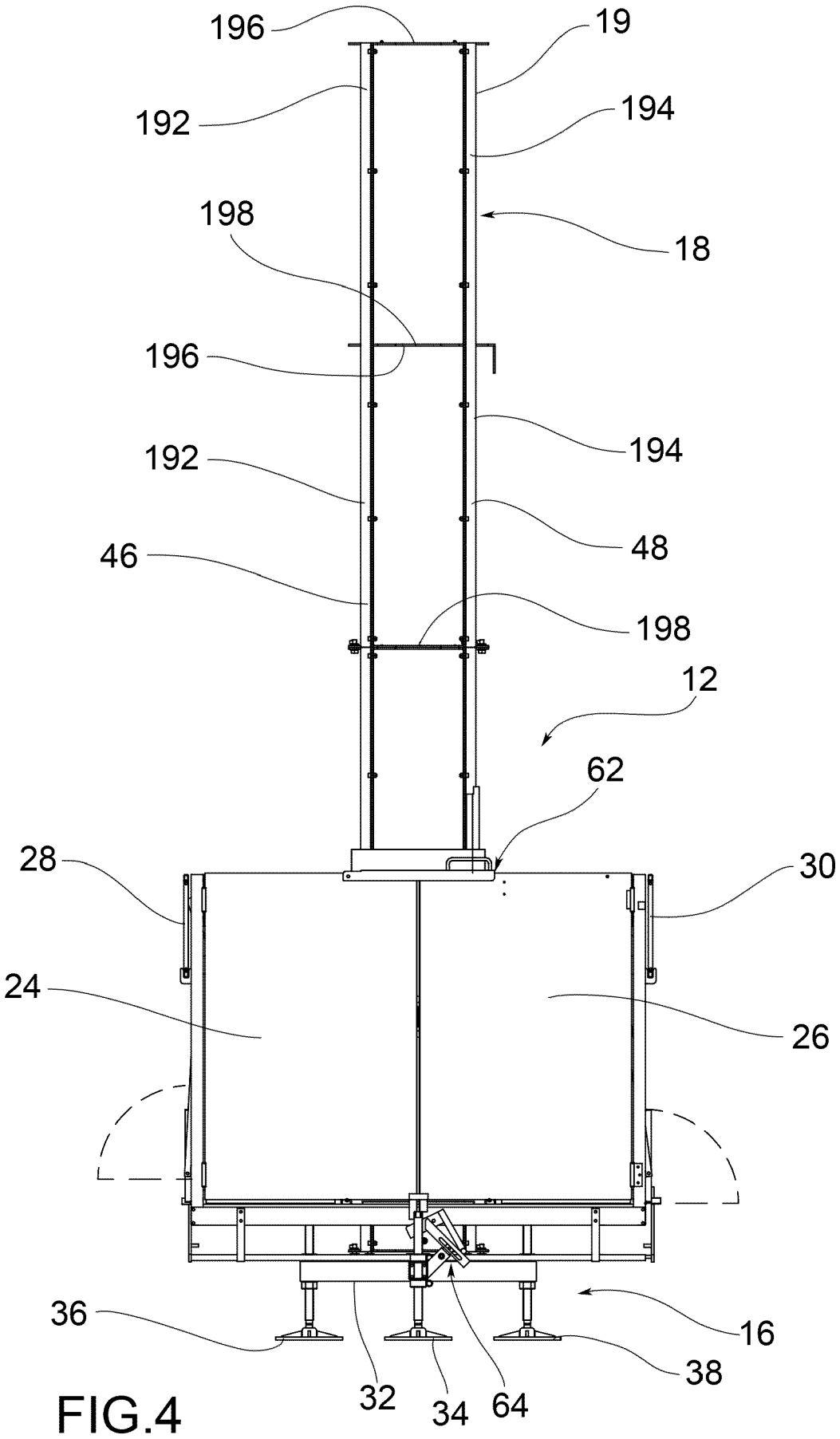
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FIG.4

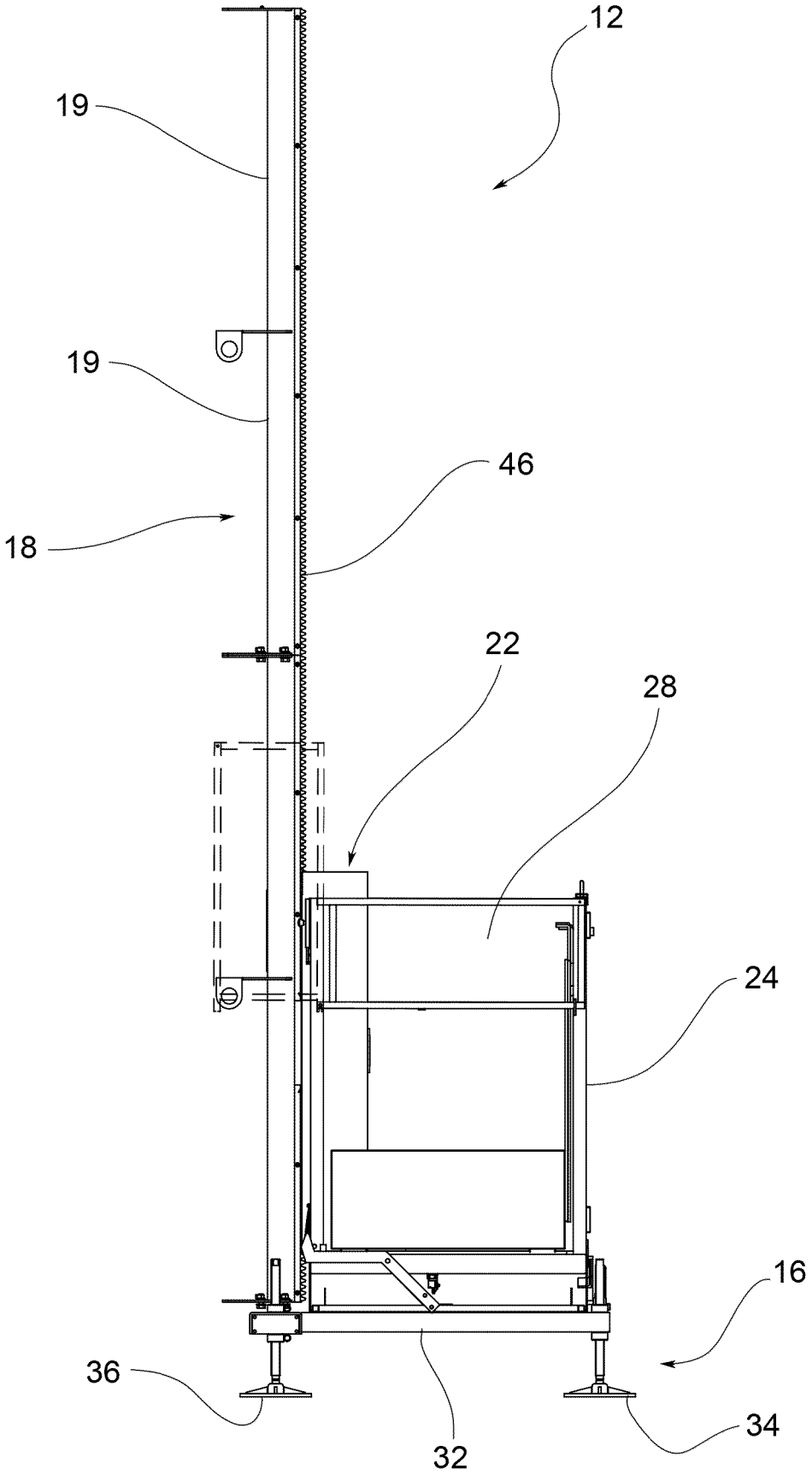

FIG.5

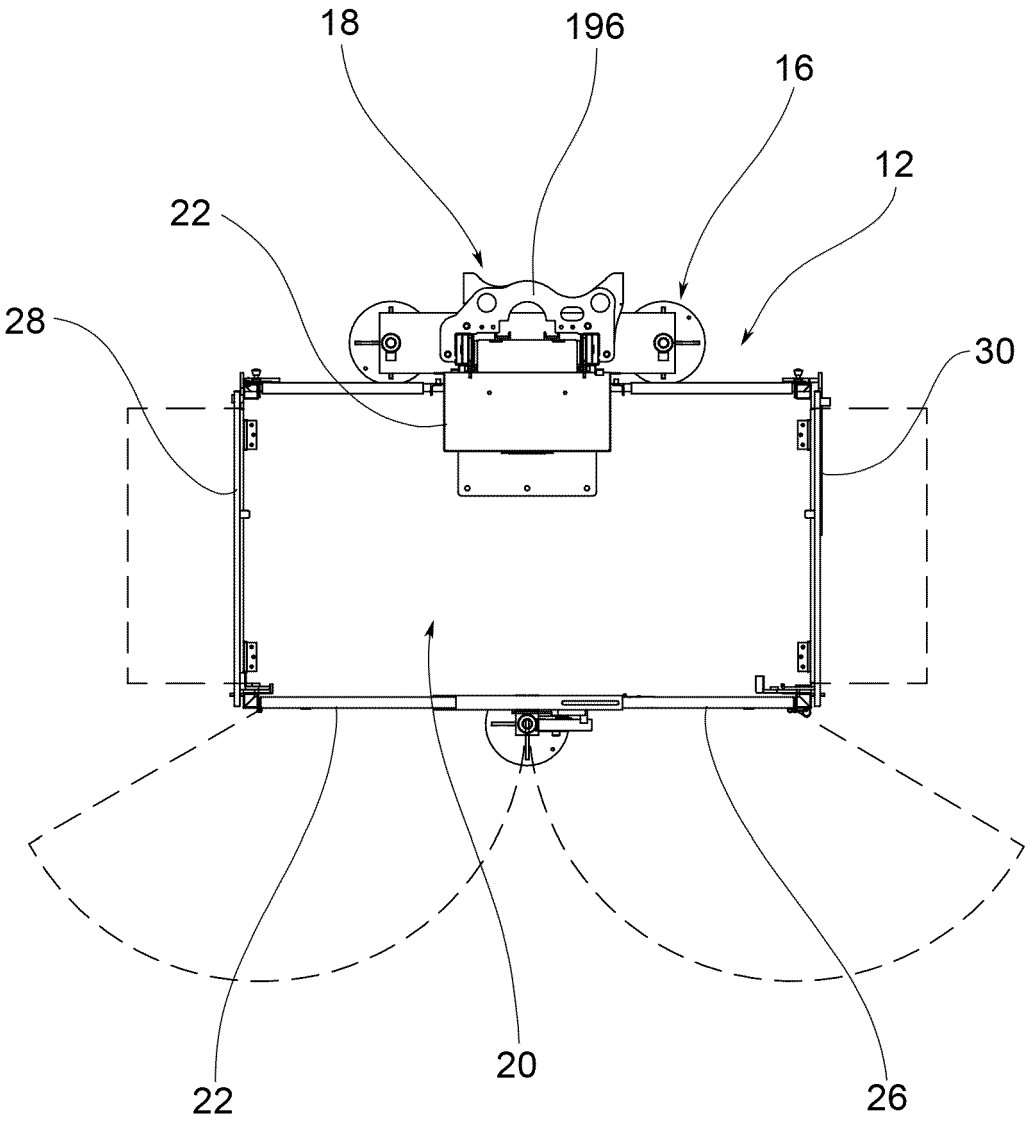

FIG.6

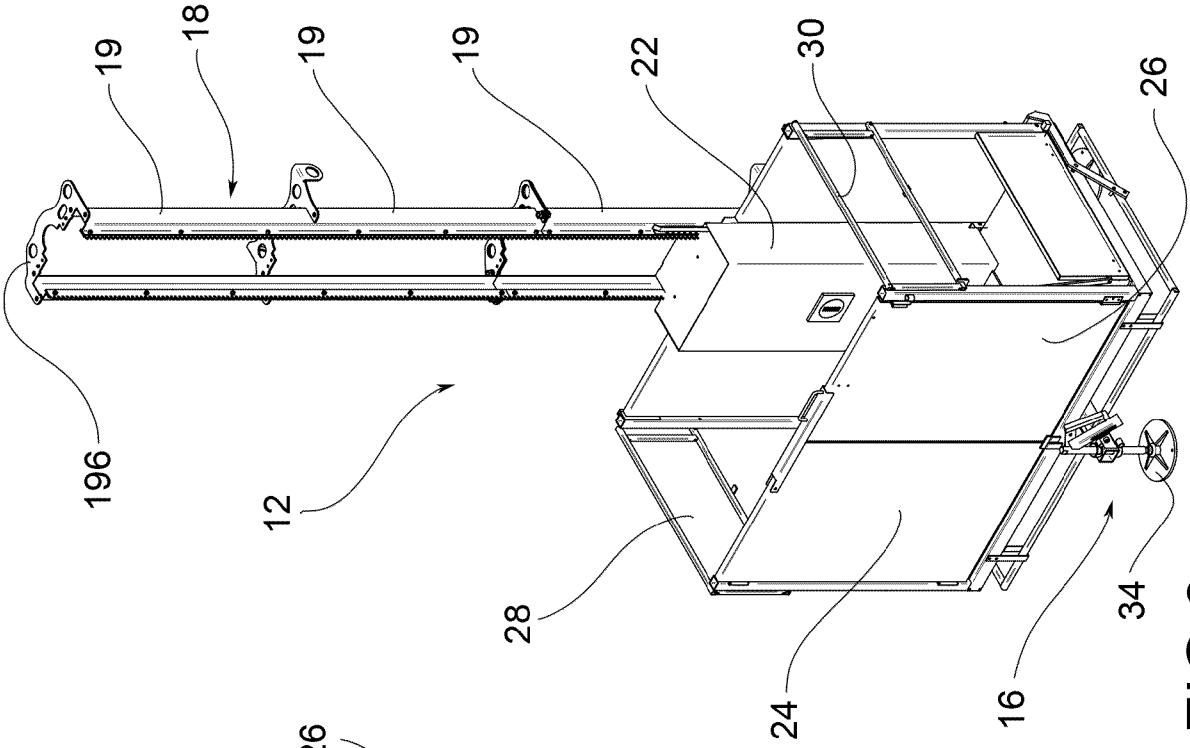
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FIG.8

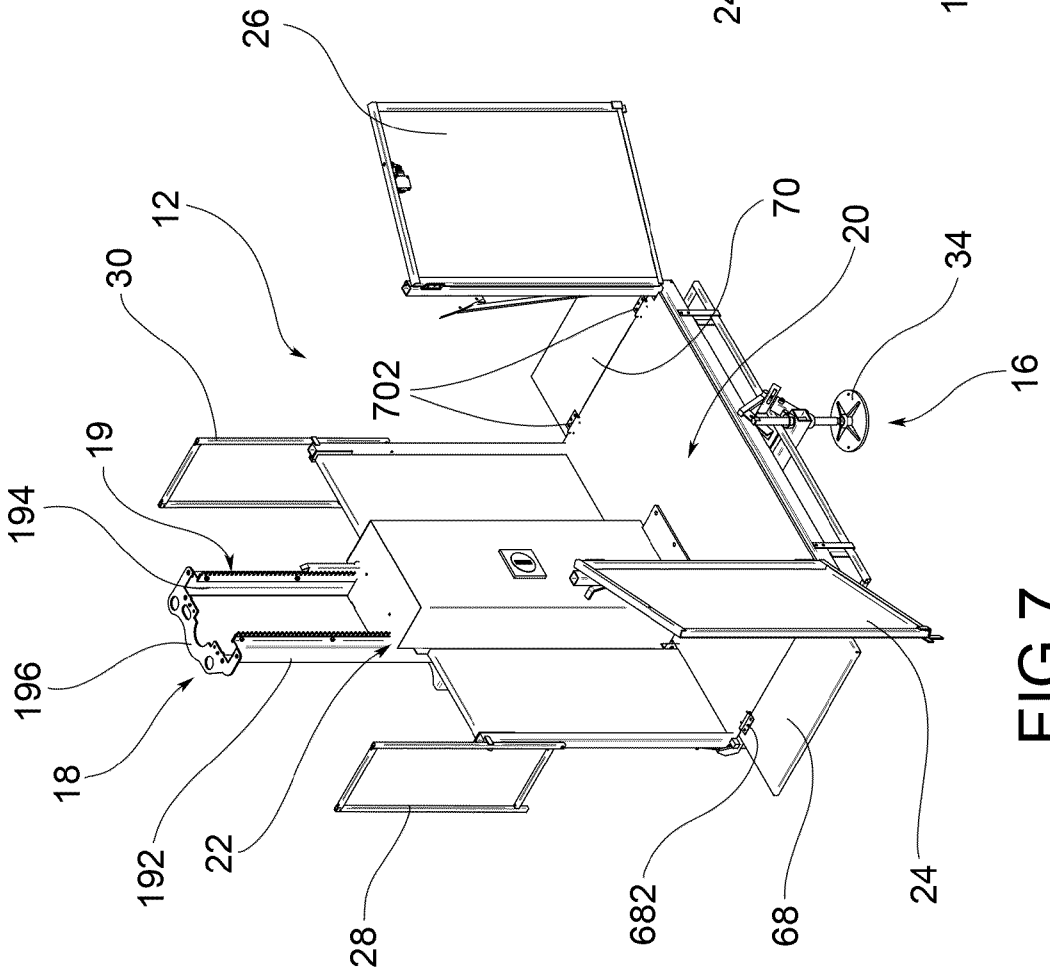
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FIG.7

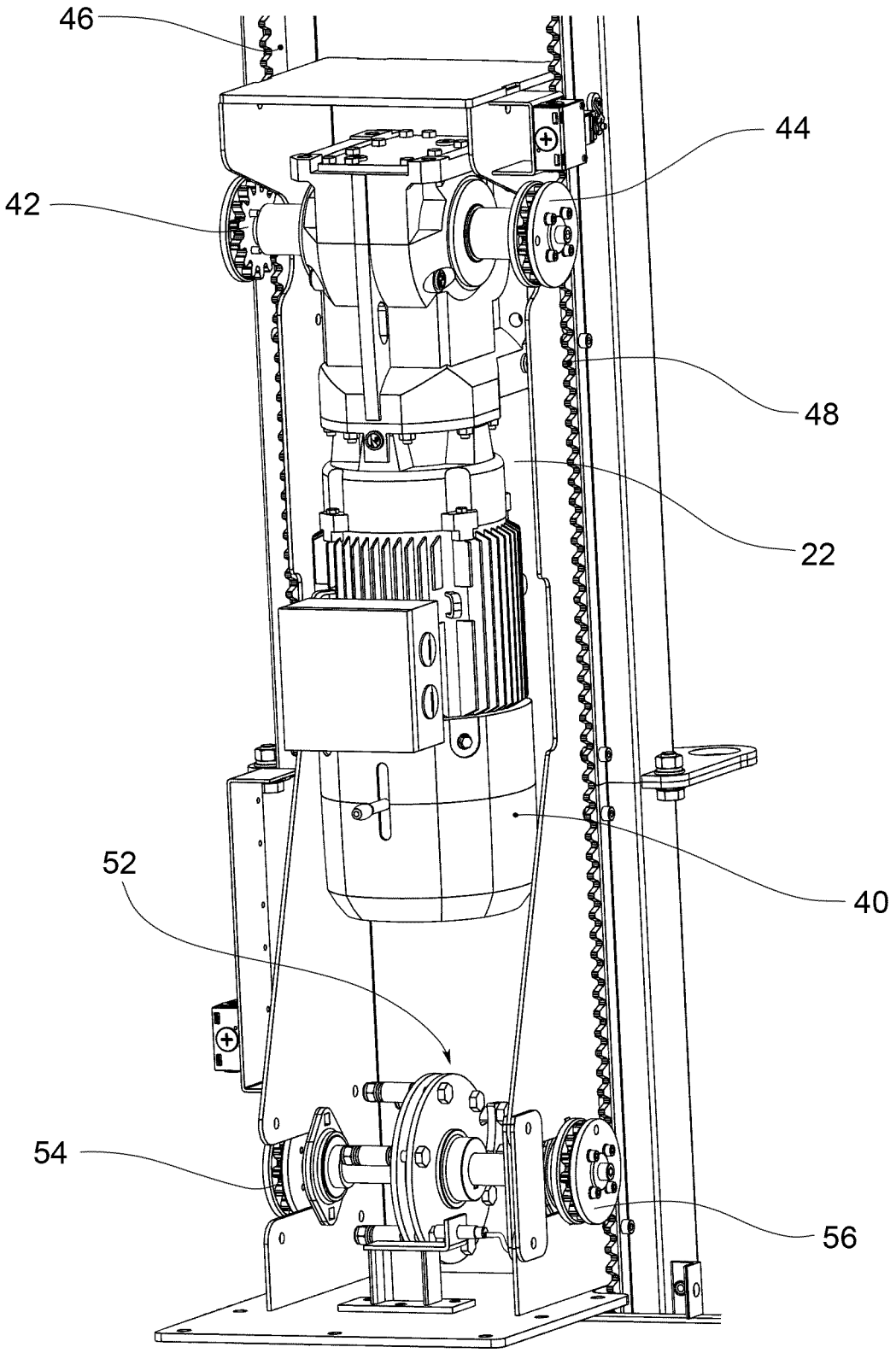

FIG.9

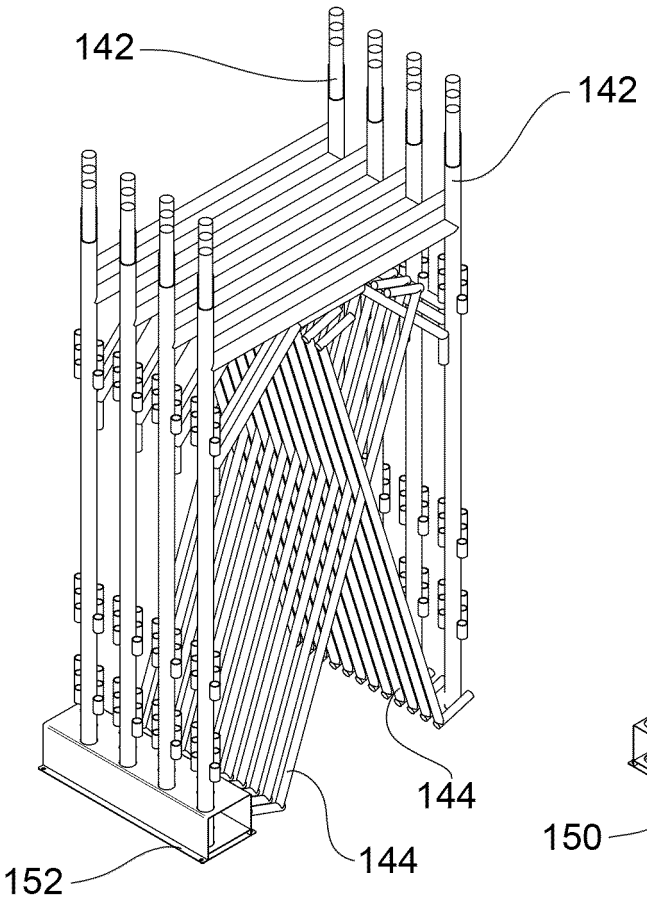

FIG.10

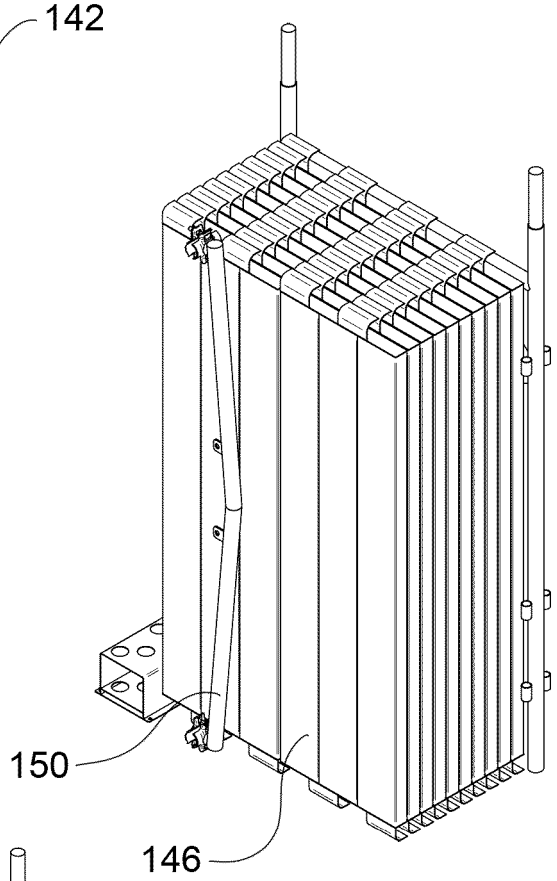

FIG.11

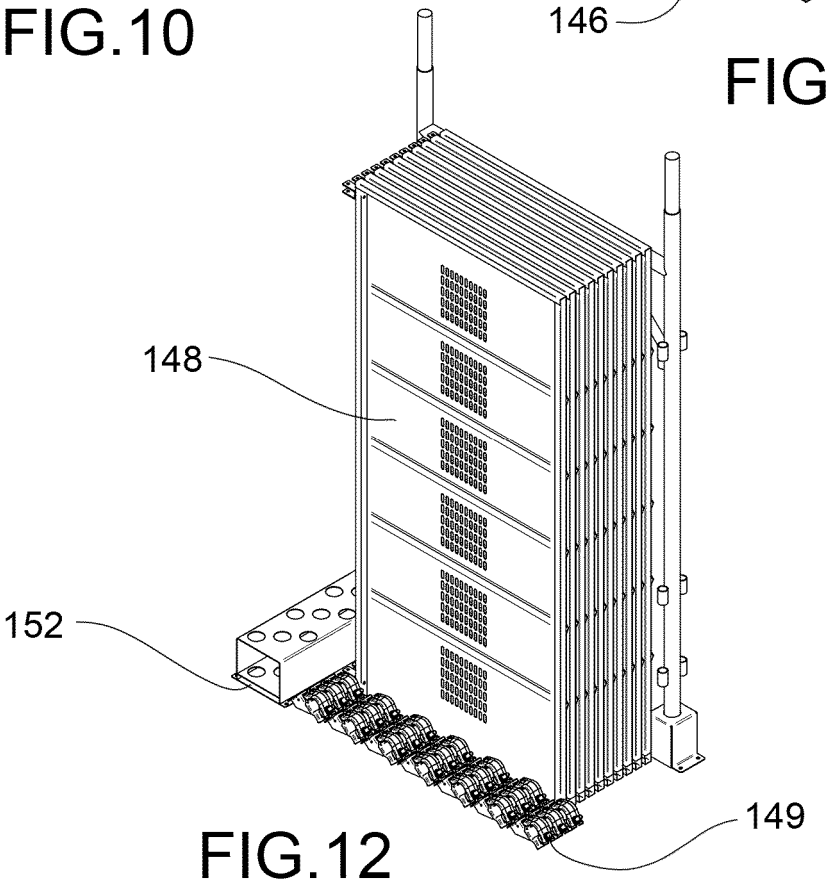

FIG.12

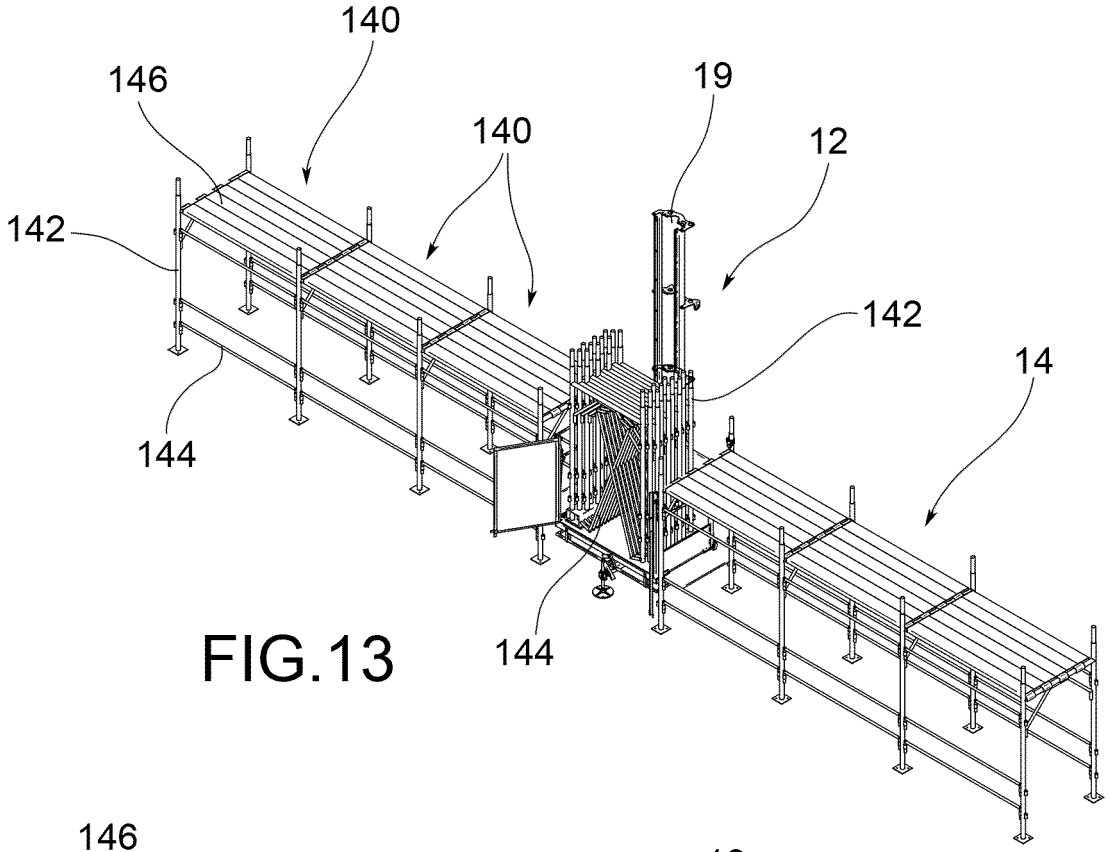

FIG.13

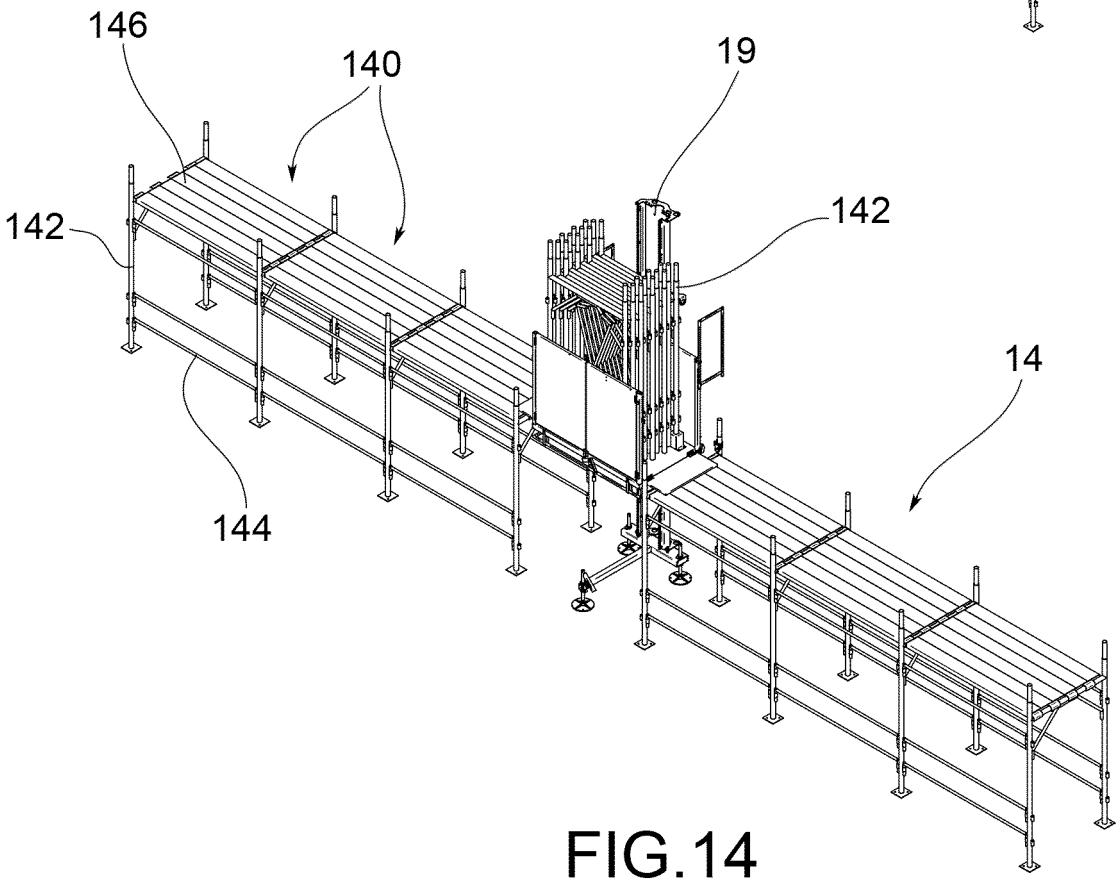

FIG.14

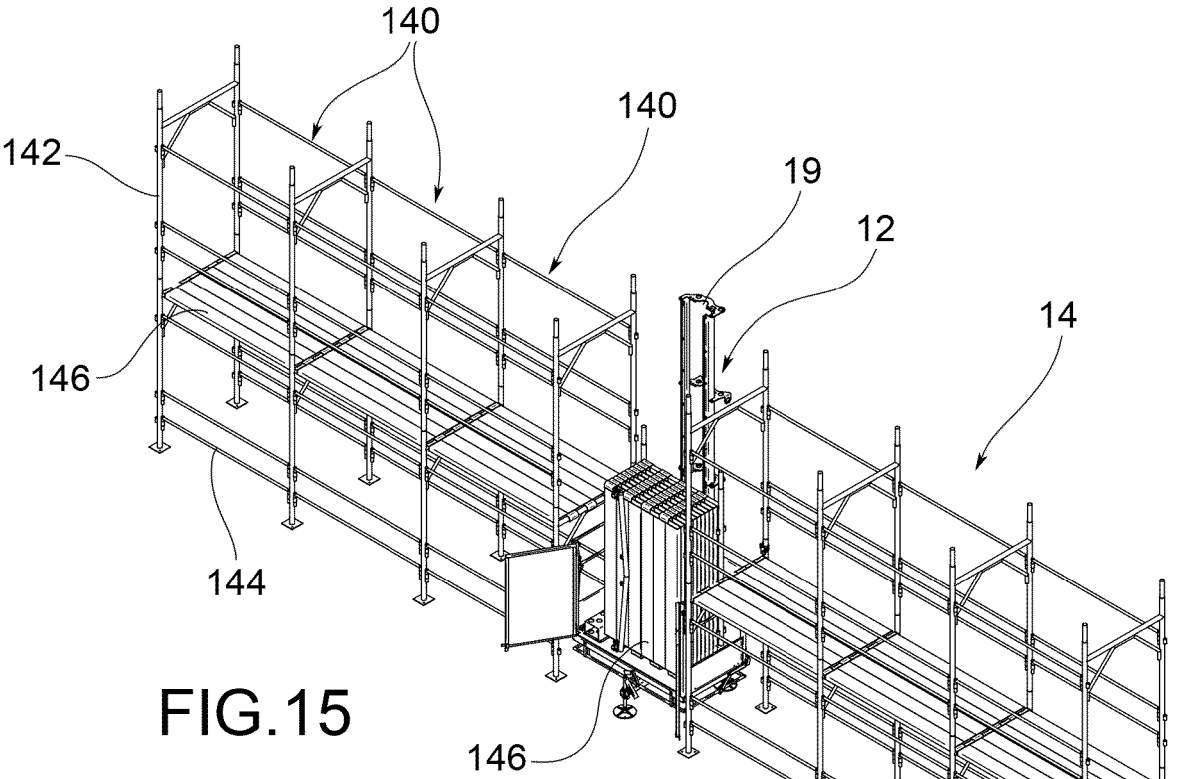

FIG.15

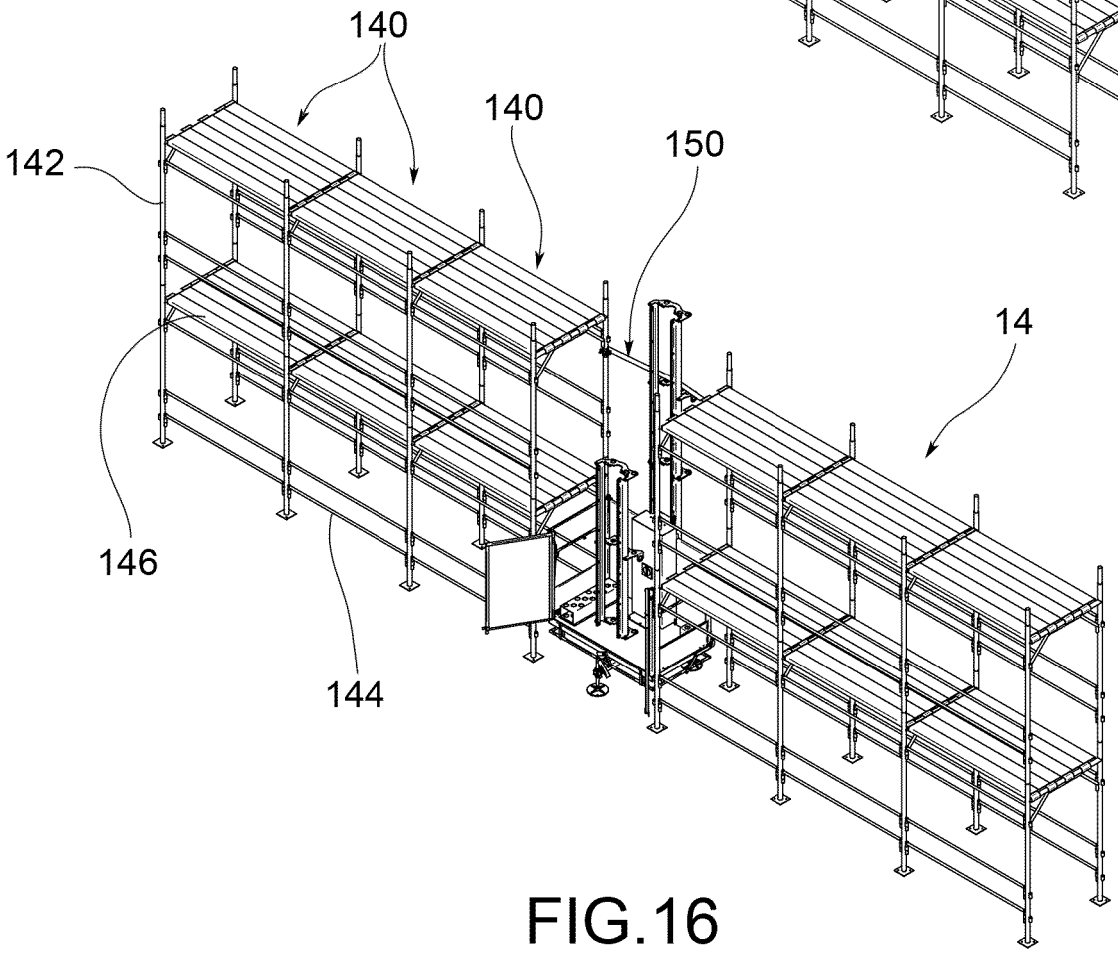

FIG.16

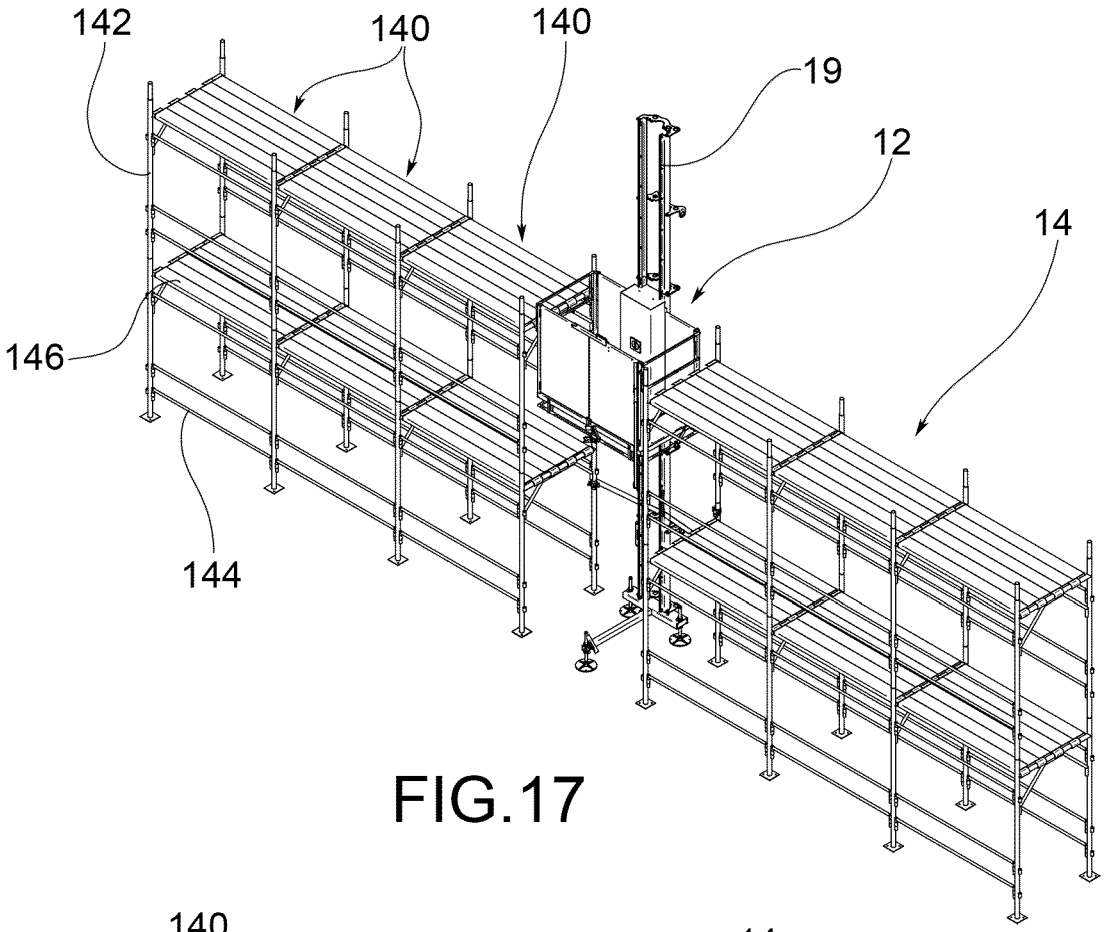

FIG.17

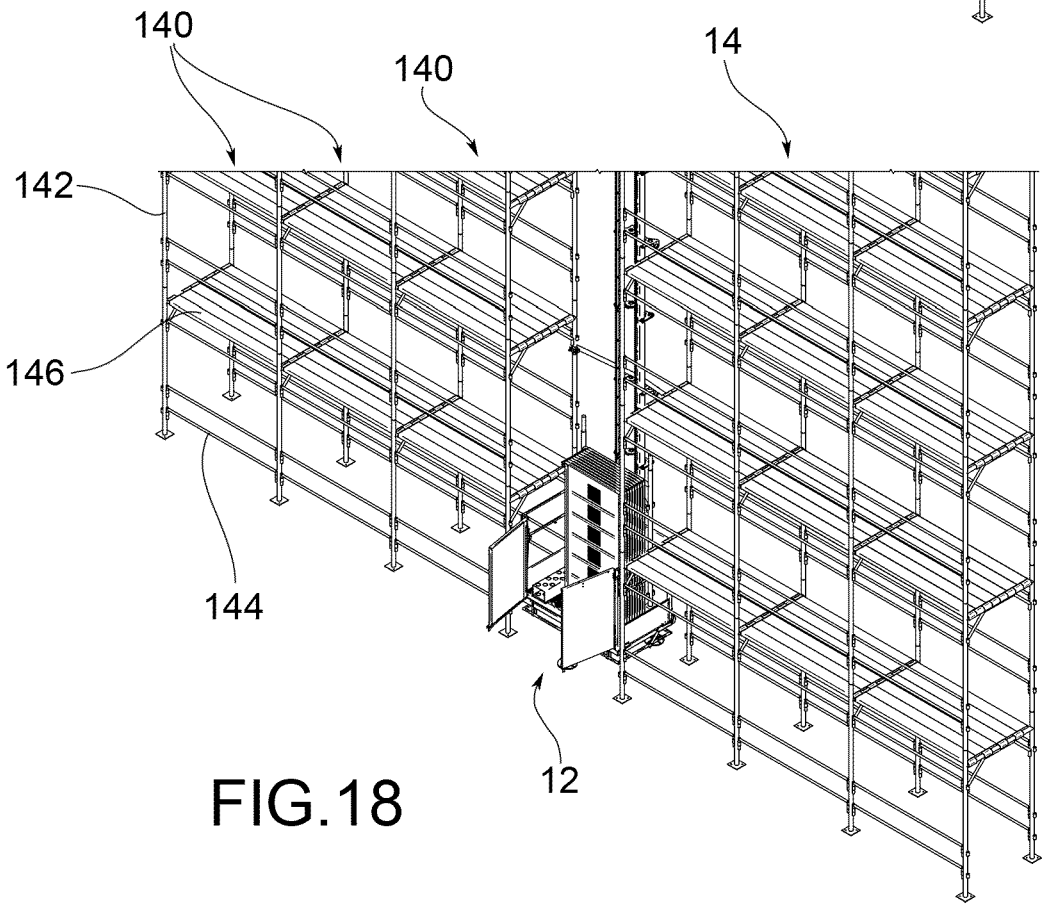

FIG.18

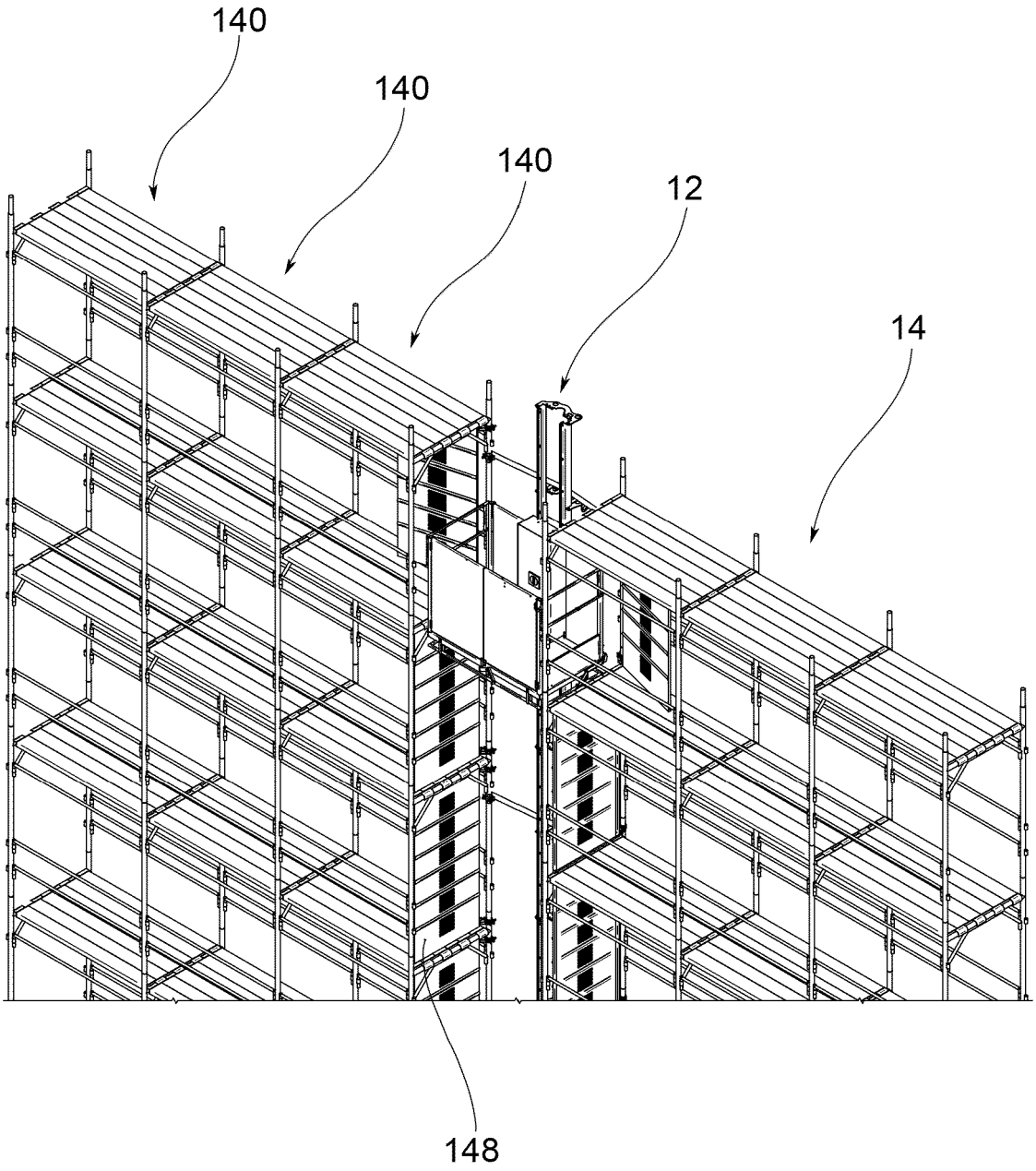

FIG.19

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EUROPEAN SEARCH REPORT

Application Number
EP 24 20 4263

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 A	EP 0 049 234 A1 (HEDSTROEM TURE) 7 April 1982 (1982-04-07) * figures 1-3 * * last paragraph; page 5 *	1-3,12, 13, 15-17,19 4-11,14, 18	INV. E04G5/00 E04G5/14 E04G1/20 E04G5/02 B66B9/187
A	WO 99/50167 A1 (ALIMAK AB [SE]; WIKLUND SVEN ERIK [SE]) 7 October 1999 (1999-10-07) * figures 3, 8 *	4	ADD. E04G3/28 E04G1/15
A	CN 110 259 083 A (UNIV CHANGZHOU) 20 September 2019 (2019-09-20) * figures 1-6 *	5-9	
A	NL 2 007 349 C2 (JONG S LIFTEN B V DE) 7 March 2013 (2013-03-07) * figures 1, 6-8 *	5-9	
A	US 2014/124293 A1 (EVERSOLE NATHAN R [US] ET AL) 8 May 2014 (2014-05-08) * figures 1, 2, 11 *	5-9	TECHNICAL FIELDS SEARCHED (IPC) E04G B66B
A	KR 102 139 885 B1 (JANG YUN GUN [KR]) 30 July 2020 (2020-07-30) * figures 3, 10 *	10,11,18	
A	CN 115 217 309 A (HUANG JUN) 21 October 2022 (2022-10-21) * figure 1 *	14	
A	CN 113 685 011 A (NINGBO ZHONGZHOU BUILDING ENG CO LTD) 23 November 2021 (2021-11-23) * figure 1 *	18	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	13 December 2024	Tryfonas, N

CATEGORY OF CITED DOCUMENTS

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13-12-2024

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0049234 A1	07-04-1982	EP 0049234 A1	07-04-1982
		SE 423893 B	14-06-1982
WO 9950167 A1	07-10-1999	AT E247070 T1	15-08-2003
		AU 758039 B2	13-03-2003
		DE 1064215 T1	23-05-2001
		DE 69910361 T2	24-06-2004
		EP 1064215 A1	03-01-2001
		HK 1035703 A1	07-12-2001
		KR 20010034693 A	25-04-2001
		US 6695097 B1	24-02-2004
		WO 9950167 A1	07-10-1999
CN 110259083 A	20-09-2019	NONE	
NL 2007349 C2	07-03-2013	NONE	
US 2014124293 A1	08-05-2014	NONE	
KR 102139885 B1	30-07-2020	NONE	
CN 115217309 A	21-10-2022	NONE	
CN 113685011 A	23-11-2021	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82