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(54) **Gangway with additional electric functionality for crafts**

Gangway für ein Schiff mit zusätzlichen Funktionalitäten

Passerelle pour bateaux comprenant des fonctionnalites électriques additionnelles

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(56) References cited:
EP-A- 1 291 278
WO-A-2006/079636
FR-A- 2 674 212
US-B1- 6 329 725

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Description

[0001] The invention relates to the nautical field and more particularly to gangways. Gangways are well known in the art and the document FR2674212, considered as being the closest prior art, discloses all the features of the preamble of independent claim 1.

[0002] In particular, the invention relates to a gangway provided with accessory devices that provide additional electric functionality, for crafts provided with electric system.

[0003] Such gangway is a system for aiding the electric connection operations at the harbor for sailing or motor, sports and non-sports crafts.

[0004] Currently, once the mooring operations have been carried out, the operations required, for almost any craft, for making the electric connection at the dock are as follows:

- Extension of the gangway, where gangway means the device (machinery) that allows connecting the craft to the mainland and going ashore. Generally, from a certain hull length on, this device is not manual, but electro-hydraulically moved. While various types and models have been used, almost all of them consist of one or more retractile and extractable modules housed in a metal structure that is made Integral with the craft hull and hidden to sight. In this way such machinery is not visible when it is not used, and through few and simple commands, the user can conveniently land.
- Connection to the "power supply from shore", wherein in nautical terms the "power supply from shore" is the means by which crafts connect to the electric network of harbors for energy supply.

[0005] Generally, the connection takes place through a cable of a suitable length provided with two plugs that at the ends are inserted on one side to a fixed outlet, the "power supply from shore", installed on board of the craft (usually aft), and on the other in the harbor dock outlet. Once the craft is moored at the harbor and the gangway has been extracted, this operation generally consists of the following actions (to be repeated in the reverse order upon the craft departure):

1) Pick up of the cable from the stowage (often very heavy and cumbersome, depending on the length, dimensions and number of conductors);
2) Craft-end connection to the power supply outlet of the electric circuit on board of the craft;
3) Transportation of the cable ashore;
4) Fixing of the cable to the mooring ropes in order to support it in the "free" portion between the craft and the dock, and accordingly prevent it from hindering or immersing in the water space opposite the dock;
5) Dock-end connection to the mains outlet located on the harbor connection post.

[0006] To facilitate this electric connection operation, some products are known which are generally called "cable winder", mainly suitable for automating the extraction and the return of the cable itself.

[0007] One of the most widespread devices is CABLEMASTER™ by the American company Glendinning Marine Products Inc.

[0008] This system substantially consists of a metal housing for protecting the cable plug (installed on the craft), an electric motor with pulleys connected thereto from within the craft (intended for the cable extraction and return) and generally of a large container wherein the cable lays, "guided" by suitable returns as needed.

[0009] Such system only partially simplifies electric connection operations, in fact it eliminates operations 1 and 2 mentioned above, facilitates but does not eliminate the operation for transporting the cable ashore already mentioned at item 3, but introduces some problems that are substantially represented by the considerable overall dimensions of the cable protection container, but also of the motor installed at the back of the outlet metal housing, which make the system installation if not in itself complicated, difficult to integrate with the other multiple equipment provided on board and in particular located in the craft stern rooms or spaces.

[0010] Moreover, considering as already said that the "power supply from shore" must be installed as much as possible aft of the craft to move it close to the dock and that, especially recently, it is common to use the aft space as a garage for tenders or water scooters that nowadays only have fuel propulsion motors, the installation of this system is actually impaired on this type of crafts, since any fuel vapors coming out of the tanks of the above mentioned means are incompatible with the electric motor usually non explosion-proof mounted on the equipment.

[0011] Finally, with particular reference to crafts constructed or intended for the European market and falling within the medium segment (comprised between 60 and 120 feet), the electric balance, and as a consequence the connection system on shore, often stabilizes around 63 or 125 A, both in 220 Vac single phase and in 380 Vac three phase, following and adjusting to the "sizes" of the connections foreseen on this market, which in Europe is standardized to 32/63/125 A.

[0012] The CABLEMASTER™ system, on the other hand, mainly devised for the American market, follows and imitates in the production and homologation of its components the different "sizes" foreseen by that market, that is 30/50/100 A.

[0013] Hence it is clear that, except for the smaller size (30A), the use of this equipment on the European market actually implies a considerable limitation of the energy that may be taken ashore, with consequent serious inefficiencies for crafts the electric balance whereof is sized, as said, on a requirement of 63 or 125 A.

[0014] Moreover, since such system, as said, is devised for the USA market, including the plug and the relative metal housing, this forces the user to use an adapter to connect to multiple standard EEC plugs, introducing possible "fault" or inefficiency points in relation to the marine environment.

[0015] Aim of the invention is to overcome the above mentioned limits and drawbacks.

[0016] The main aim is to transfer the power supply of the craft electric circuit as close as possible to the dock, so as to reduce the length and the weight of the connection cable to shore, using a device already provided in crafts.

[0017] A further aim is to totally avoiding the use of a connection cable separate from the craft circuit, providing a storage system close to the power supply from shore.

[0018] The aims are achieved with a gangway with additional electric functionality for crafts provided with electric system, comprising:

- a containing structure that may be permanently associated to the hull of a craft;
- at least one modular element that may be pulled out and retractile with respect to said containing structure,
  characterized in that it comprises:
- a first power outlet associated to said containing structure;
- a second power outlet associated to said at least one modular element that may be pulled out and retractile;
- an electric cable associated to said at least one modular element arranged for connecting said two power outlets;

wherein said first power outlet is arranged for connecting to the electric circuit of the craft, said electric cable is arranged for integrating in said electric circuit of the craft and said second power outlet is arranged for acting as power supply from shore of said electric circuit of the craft.

[0019] According to an aspect of the invention, said electric cable has a length longer than that of the extractable element and is guided and protected in the extraction and return movement of the modular element by a flexible track device.

[0020] According to a further aspect of the invention, the gangway comprises a system for storing the electric cable and the second power outlet is reversibly associated to said modular element so that it may be extracted from its seat and directly connected to the mains outlet located on the harbor dock.

[0021] According to a preferred aspect, said system for storing the electric cable consists of at least two return pulleys whereof at least one is mobile parallely to the axis of said modular element.

[0022] According to an even more preferred aspect, the mobile pulley of said system for storing the electric cable is actuated by a manual or motor device.

[0023] In a further embodiment of the invention, the system for storing the electric cable comprises a spool whereon said electric cable is reversibly wound, with spring return systems.

[0024] According to a further aspect of this embodiment, the system for storing the electric cable comprises a spool and a motorized unwinding for facilitating the unwinding and rewinding of said cable.

[0025] The use of the gangway element already provided on crafts for moving the craft connection point as close as possible to the outlet on shore partially or totally eliminates the operations described above (on a craft there cannot be a point closer to the dock than the gangway tip), and therefore it obtains the following main advantages:

- prevents the operations 1, 2, 3, 4 mentioned above and related to the craft mooring;
- eliminates the outlet (or relevant metal housing for cable winders) installed on the craft, with considerable saving on work, as very often such outlet is connected in special "recesses" provided with door to avoid defacing the lines and the aesthetics of the craft;
- allows a considerable recovery of onboard space, very important especially in stern rooms and recesses;
- eliminates any stand-alone machinery (traditional cable winders) with saving in terms of maintenance management, especially with the version that provides for a hydraulically motor-driven storage system, which may use the same pump as the gangway;
- in the event of a failure it allows extracting the cable and making the relevant connection to dock even manually, with few simple scheduled operations, while in the case of traditional cable winders such operation is only possible by removing mechanical parts of the machinery;
- offers a considerable improvement of the safety and aesthetics of the moored craft, avoiding the hindrance cable aft or fixed to the mooring ropes.

[0026] The advantages of the invention shall appear more clearly from the following description of preferred embodiments, made by way of an indicative and non-limiting example with reference to the figures, wherein:

Figs. 1 and 2 show a schematic side view of a gangway according to the invention, provided with a single extractable and retractile modular element, respectively in stand-by and use position;

Figs. 3-5 show schematic side views of a gangway provided with two modular elements in various usage positions;

Fig. 6 shows a schematic side view of a detail of an outlet associated to a modular element of the gangway;

Fig. 7 shows a perspective transparency view of a

gangway with mobile modular element provided with a first system for storing the electric cable;

Fig. 8 shows a schematic perspective view of a detail of a manual movement crank of the system for storing the electric cable of Fig. 7;

Fig. 9 shows a schematic front view of a detail of the modular end element of the gangway provided with a system for storing the electric cable;

Figs. 10-12 show schematic perspective views of various possible locations of the end plug of the electric cable;

Fig. 13 shows a schematic bottom view of a gangway with a system for storing the electric cable with a plurality of mobile and fixed return pulleys;

Fig. 14 shows a schematic bottom view of a gangway with a system for storing the electric cable with spool and spring rewinding associated to a modular element;

Figs. 15 and 16 show a schematic side view of a gangway with a system for storing the electric cable with spool and spring taking up associated to the containing structure respectively with and without motorized unwinding.

[0027] With reference to the details shown in the figures, gangway 1 for crafts provided with electric system comprises a containing structure 2 for at least one modular element 3 that may be pulled out and retractile from said structure 2.

[0028] Structure 2 may be made with a metal tank or other construction types, also with a simple frame, and is usually steadily associated to the craft's structural hull.

[0029] A power outlet 4 is steadily associated to structure 2, where the term outlet shall be understood, in the present description, in general meaning, as it may also be represented by a plug, an electric board, a cable segment or more in general, by any other electric connection system between two circuits. Said outlet 4 is arranged for connecting to the electric circuit of the craft.

[0030] A further power outlet 5 is associated to the mobile modular element 3, wherein also in this case the term shall be understood with a general meaning.

[0031] An electric cable 6 is arranged in the modular element 3 for connecting said outlets 4 and 5, so that the cable itself becomes part of the electric circuit of the craft and outlet 5 becomes the power supply from shore of said electric circuit of the craft.

[0032] Cable 6 may be fixed, besides outlets 4 and 5, also at a point 7 located on board of an element 8 sliding in structure 2 and associated to the modular element 3 with hinge means 9 of the known type, arranged for allowing the control of the inclination of the gangway vertical surface.

[0033] Between the fixing points 4, 5 and 7, cable 6, which has a length longer than that of the extractable element, may be guided and supported in its movement by a flexible track device 10 of the known type.

[0034] In the case of a gangway consisting of a plurality of modular elements 3, 3', there is also a plurality of fixing points 7, 7' and of flexible devices 10, 10' as illustrated in Figs. 3-5.

[0035] With reference now to Figs. 7-16, where some embodiments of the invention are shown, the power outlet 5 is reversibly associated to the mobile element 3 of gangway 1, so as to be extracted from its housing and connected to the mains outlet located on the harbor dock.

[0036] In such embodiments of the invention, suitable systems for storing the electric cable 6 are provided on gangway 1.

[0037] Two examples of storage systems essentially consisting of a mobile undercarriage 11 and a substantially fixed undercarriage 12 are illustrated in Figs. 7-13.

[0038] Return pulleys 13, 13', 13", 13'" are turnably associated on the mobile undercarriage 11, whereas return pulleys 14, 14', 14", 14'" are turnably associated on undercarriage 12.

[0039] Undercarriage 11 slides along the longitudinal axis of the modular element 3 by the effect of a connection between wheels 15, 15' and corresponding linear guides 16, 16'.

[0040] The movement or locking of undercarriage 11 is caused by pulling belts 17, 17' fixed to undercarriage 11 and actuated by pinions 18, 18' and 19, 19' respectively connected to automatic 20 or manual 21 crank moving means.

[0041] The automatic moving means 20 may consist of electric or hydraulic motors and may optionally be powered by the same hydraulic pump that moves gangway 1.

[0042] Crank 21 for manual actuation may be of the type reversibly insertable in a housing arranged in axis 22 of pinions 19, 19' or it may be of the articulated type and connected to axis 22 too, as illustrated in Fig. 8.

[0043] The manual system may be provided also in the motor-driven version, to be used as emergency maneuver.

[0044] Undercarriage 11 is substantially fixed on the front portion of the modular element 3, being connected to the latter by shock absorbing springs 23, 23' arranged for compensating with small movements the tractions made by cable 6.

[0045] The storage system according to the first exemplary embodiment therefore consists of two or more returns or pulleys 13-14, or longitudinally opposite guides with a very low friction and allows extracting from the free end of the modular element 3 as many meters of cable equal to the net length of the element, excluding the overall dimensions of pulleys and undercarriages, multiplied by the number of returns.

[0046] To allow the extraction of cable 6 from the modular element 3, outlet 5 will be of the type reversibly associable to the free end of said element 3, as illustrated in detail in Figs. 10-12, wherein there is also shown a door 25 arranged for closing the space wherein outlet 5 is stored.

[0047] In order to facilitate the movements of cable 6 and prevent damages, suitable protections 24 (or slides,

or returns) of self-lubricating plastic material may be provided along the entire path of the same cable.

[0048] In order to increase the number of returns and thus the length of the extractable cable, a flat section cable may be used, which allows bending with smaller bending radius and the use of pulleys with a smaller diameter, also usable with horizontal rather than vertical axis of rotation.

[0049] The second example of storage illustrated in Fig. 12 differs from the first one simply in that a plurality of pulleys 13', 13", 13"' is associated to the mobile undercarriage, and a plurality of pulleys 14, 14', 14", 14"' is associated to the fixed undercarriage 12.

[0050] A third example of system for storing cable 6 is illustrated in Fig. 14 and substantially comprises a storage spool 26 with spring or motor rewinding system. Spool 26 is associated to the end element 3 of gangway 1.

[0051] A fourth example of system for storing cable 6 is schematically illustrated in Fig. 15, wherein there is provided a motor rotating taking up 27 with spring or motor regeneracy of the known type, associated to the containing structure 2 of the gangway.

[0052] The electric connection between outlet 4 and cable 6 is carried out by rotating contacts provided on taking up 27.

[0053] This solution is particularly advantageous when the request for cable storage is particularly heavy or the gangway thickness is particularly small.

[0054] A fifth example of system for storing cable 6 is schematically illustrated in Fig. 16, wherein there is still provided a motor rotating taking up 27 of the type with motorized taking up of the known type, and a motorized unwinding 28 arranged in the front portion of element 3 arranged for allowing the traction of cable 6 for facilitating the extraction thereof.

[0055] This solution is particularly advantageous for storing and managing large amounts of cable in winding and unwinding.

[0056] In this case, the motorized movements of taking up 27 and of unwinding 28 must be coordinated with those of the mobile elements 3 of the gangway.

[0057] In all cases of motorized storage of cable 6 there may be provided, to complete the invention, safety systems, systems for controlling the cable movement, etc.

[0058] For example, a suitable movement sensor may be provided for cable 6 (with encoder or the like) arranged at the housing of outlet 5, which reading the movement of the cable, carries out the safety functions (stopping motor 20 or moving undercarriage 11, if the cable does not slide).

[0059] As an alternative to the movement sensor, limit switch sensors may be used, arranged in the housing of outlet 5, arranged for locking the motorized taking up mechanism when outlet 5 returns in the housing.

[0060] As a further alternative, a sensor for detecting the extension of the compensating springs 23, 23' may be used, which shall activate when the spring elongation, caused by the locking of the cable due to the return of outlet 5 in the housing, exceeds a predetermined value.

[0061] In order to prevent traction hazards on outlet 5 during the return in the housing, on the end portion of the cable there will be a jaw well tightened on the cable itself, which shall act on the limit switch arranged in the outlet housing or act as a mechanical stop, if the spring elongation sensor is used.

[0062] The operation of the invention is described below.

[0063] In the case of cable 6 without storage systems and outlet 5 fixed on the advanced free end of the mobile element 3, it will be sufficient to connect outlet 5 to the mains outlet located on the harbor dock with a cable of a limited length.

[0064] Optionally, it may be necessary to use a similar cable for connecting outlet 4 to the control panel of the electric system on board of the craft, but such cable with connecting plugs may be replaced by fixed connections. Usually, that is to say, a direct connection may be made between end 4 of cable 6 and the craft power supply system.

[0065] If cable 6 is provided with storage systems, the user may grip outlet 5 and pull out cable 6 from the gangway with a slight tug, with the aid of either manual 21 or motor-driven movement systems 20, 26, 27, 28, so as to lead outlet 5 directly to insert in the electric power supply panel provided on the harbor dock.

[0066] Of course, the construction details and the embodiments may widely vary compared to what described and illustrated, without departing from the scope of the present invention as described, illustrated and claimed:

[0067] For example, in simple applications of the invention, intended for small crafts, the system may be made as an assembly kit to be easily integrated in existing gangways to provide them with new electric functionality.

Claims

1. A gangway (1) with additional electric functionality for crafts provided with electric system, comprising:

   - a containing structure (2) that may be permanently associated to the hull of a craft;
   - at least one modular element (3) that may be pulled out and retractile with respect to said containing structure (2), **characterized in that** it has additional electric functionalities and comprises:
   - a first power outlet (4) associated to said containing structure (2);
   - a second power outlet (5) associated to said at least one modular element (3) that may be pulled out and retractile;
   - an electric cable (6) associated to said at least one modular element (3) arranged for connecting said two power outlets; wherein said first power outlet (4) is arranged for connecting to

the electric circuit of the craft, said electric cable (6) is arranged for integrating in said electric circuit of the craft and said second power outlet (5) is arranged for acting as power supply from shore of said electric circuit of the craft.

2. A gangway according to claim 1, **characterized in that** said cable (6) has a length superior to the one of the element that may be pulled out.

3. A gangway according to claim 2, **characterized in that** said cable (6) is guided and supported in its movement by a flexible device (10).

4. A gangway according to claim 1, **characterized in that** said power outlet (5) is reversibly associated to said mobile element (3) of the gangway (1).

5. A gangway according to claim 1, **characterized in that** said gangway (1) comprises appropriate systems (13, 13', 13", 13"', 14, 14', 14", 14"', 26, 27) for storing the electric cable (6).

6. A gangway according to claim 5, **characterized in that** said means for storing the electric cable (6) comprise at least two return pulleys (13, 14), whereby at least one is mobile.

7. A gangway according to claim 6, **characterized in that** said mobile pulley (13) is associated to an undercarriage (11) sliding along the longitudinal axis of the modular element (3) by means of kinematics (15, 15', 16, 16', 17, 17', 18, 18' and 19, 19') operated by automatic (20) or manual (21) moving means.

8. A gangway according to claim 5, **characterized in that** said means for storing the electric cable (6) comprise a spool (26) with a spring or motor rewinding system, associated to the end element (3) of the gangway (1).

9. A gangway according to claim 5, **characterized in that** said systems for storing the electric cable (6) comprise a rotating taking up (27) with a spring or motor regeneracy, associated to the containing structure (2) of the gangway (1).

10. A gangway according to claim 9, **characterized in that** said system for storing the electric cable (6) with motor rotating taking up (27) comprises a motorized unwinding (28) associated to said mobile element (3) of the gangway (1).

Patentansprüche

1. Gangway (1) mit zusätzlichen elektrischen Funktionalitäten für Wasserfahrzeuge, die mit Stromversorgung ausgerüstet sind, bestehend aus:

- einer Struktur zum Enthalten (2), die mit dem Schiffskörper fest verbunden sein kann;
- aus mindestens einem modularen Element (3), das aus genannter Struktur (2) herausgezogen und in diese wieder eingezogen werden kann, **dadurch gekennzeichnet, dass** sie zusätzliche elektrische Funktionalitäten hat und aus
- einer ersten Steckdose (4), die mit der genannten Struktur (2) zum Enthalten verbunden ist,
- einer zweiten Steckdose (5), die mit dem mindestens einem aus- und einziehbaren modularen Element (3) verbunden ist sowie
- einem Stromkabel (6), das mit dem mindestens einem modularen Element (3) zum Verbinden der zwei genannten Steckdosen verbunden ist,

besteht;
worin die genannte erste Steckdose (4) für den Anschluss an den Stromkreis des Wasserfahrzeugs vorgesehen ist, wobei genanntes Stromkabel (6) zum Integrieren in genannten Stromkreis des Wasserfahrzeugs vorgesehen ist und genannte zweite Steckdose (5) vorgesehen ist, um als Fremdspeisung von genanntem Stromkreis des Wasserfahrzeugs zu fungieren.

2. Gangway nach Anspruch 1, **dadurch gekennzeichnet, dass** genanntes Stromkabel (6) eine höhere Länge als die des ausziehbaren Elements hat.

3. Gangway nach Anspruch 2, **dadurch gekennzeichnet, dass** genanntes Stromkabel (6) in seiner Bewegung durch eine flexible Vorrichtung (10) geführt und getragen wird.

4. Gangway nach Anspruch 1, **dadurch gekennzeichnet, dass** genannte Steckdose (5) mit genanntem beweglichen Element (3) der Gangway (1) auf reversible Weise verbunden ist.

5. Gangway nach Anspruch 1, **dadurch gekennzeichnet, dass** genannte Gangway (1) geeignete Systeme (13, 13', 13", 13"', 14, 14', 14", 14"', 26, 27) für die Lagerung des Stromkabels (6) umfasst.

6. Gangway nach Anspruch 5, **dadurch gekennzeichnet, dass** genannte Mittel für die Lagerung des Stromkabels (6) mindestens zwei Umkehrrollen (13, 14) umfassen, wobei mindestens eine beweglich ist.

7. Gangway nach Anspruch 6, **dadurch gekennzeichnet, dass** genannte bewegliche Umkehrrolle (13) mit einem Fahrwerk (11) verbunden ist, dass entlang der Längsachse des modularen Elementes (3) durch kinematische Mittel (15, 15', 16, 16', 17, 17', 18, 18' und 19, 19') gleitet, die durch automatische (20) oder

manuelle (21) Schiebevorrichtungen betätigt werden.

8. Gangway nach Anspruch 5, **dadurch gekennzeichnet, dass** genannte Mittel für die Lagerung des Stromkabels (6) eine Abwickelrolle (26) mit einem Feder- oder Motorrückspulsystem umfassen, die mit dem Element (3) der Gangway (1) verbunden ist.

9. Gangway nach Anspruch 5, **dadurch gekennzeichnet, dass** das genannte System für die Lagerung des Stromkabels (6) eine rotierende Aufwickelvorrichtung (27) mit einer Feder- oder Motorwiederaufwicklung umfasst, die mit der Struktur (2) zum Enthalten der Gangway (1) verbunden ist.

10. Gangway nach Anspruch 9, **dadurch gekennzeichnet, dass** das genannte System für die Lagerung des Stromkabels (6) mit rotierender Triebaufwickelvorrichtung (27) eine motorisierte Abspulvorrichtung (28) umfasst, die mit genanntem beweglichen Element (3) der Gangway (1) verbunden ist.

Revendications

1. Une passerelle (1) avec une fonctionnalité électrique supplémentaire pour des embarcations dotées de système électrique, comprenant :

- une structure de rétention (2) qui peut être associée de manière permanente à la coque d'une embarcation ;
- au moins un élément modulaire (3) qui peut être sorti et rétractable par rapport à ladite structure de rétention (2),

caractérisé par le fait qu'il possède des fonctionnalités électriques supplémentaires et comprend:

- une première prise de courant (4) associée à ladite structure de rétention (2) ;
- une deuxième prise de courant (5) associée audit au moins un élément modulaire (3) pouvant être sorti et rétractable ;
- un câble électrique (6) associé audit au moins un élément modulaire (3) prévu pour le raccordement desdites deux prises de courant ;

où ladite première prise de courant (4) est prévue pour le raccordement au circuit électrique de l'embarcation, ledit câble électrique (6) est prévu pour l'intégration audit circuit électrique de l'embarcation et ladite deuxième prise de courant (5) est prévue pour servir de prise de courant à terre dudit circuit électrique de l'embarcation.

2. Une passerelle selon la revendication 1, **caractérisée par le fait que** ledit câble (6) possède une longueur supérieure à celle de l'élément qui peut être sorti.

3. Une passerelle selon la revendication 2, **caractérisée par le fait que** ledit câble (6) est guidé et soutenu dans ses mouvements par un dispositif flexible (10).

4. Une passerelle selon la revendication 1, **caractérisée par le fait que** ladite prise de courant (5) est associée de manière réversible audit élément mobile (3) de la passerelle (1).

5. Une passerelle selon la revendication 1, **caractérisée par le fait que** ladite passerelle (1) comprend des systèmes appropriés (13, 13', 13", 13"', 14, 14', 14", 14"', 26, 27) pour ranger le câble électrique (6).

6. Une passerelle selon la revendication 5, **caractérisée par le fait que** lesdits dispositifs de rangement du câble électrique (6) comprend au moins deux poulies de retour (13, 14), au moins une desquelles étant mobile.

7. Une passerelle selon la revendication 6, **caractérisée par le fait que** ladite poulie mobile (13) est associée à un châssis de roulement (11) coulissant le long de l'axe longitudinal de l'élément modulaire (3) à l'aide d'une cinématique (15, 15', 16, 16', 17, 17', 18, 18' et 19, 19') actionnée par des dispositifs de déplacement automatiques (20) ou manuels (21).

8. Une passerelle selon la revendication 5, **caractérisée par le fait que** lesdits moyens de rangement du câble électrique (6) comprennent un touret (26) avec un système d'enroulement à ressort ou moteur, associé à l'élément final (3) de la passerelle (1).

9. Une passerelle selon la revendication 5, **caractérisée par le fait que** lesdits moyens de rangement du câble électrique (6) comprennent un palier tendeur rotatif (27) avec une régénération à ressort ou moteur, associé à la structure de rétention (2) de la passerelle (1).

10. Une passerelle selon la revendication 9, **caractérisée par le fait que** ledit système de rangement du câble électrique (6) avec palier tendeur rotatif à moteur (27) comprend un dérouleur motorisé (28) associé audit élément mobile (3) de la passerelle (1).

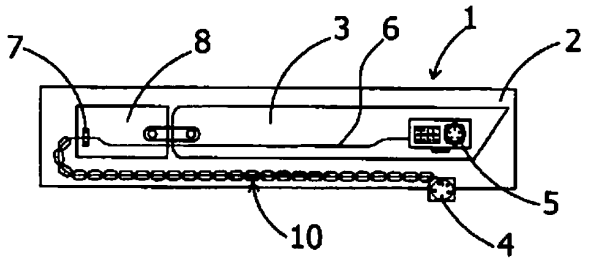


Fig. 1

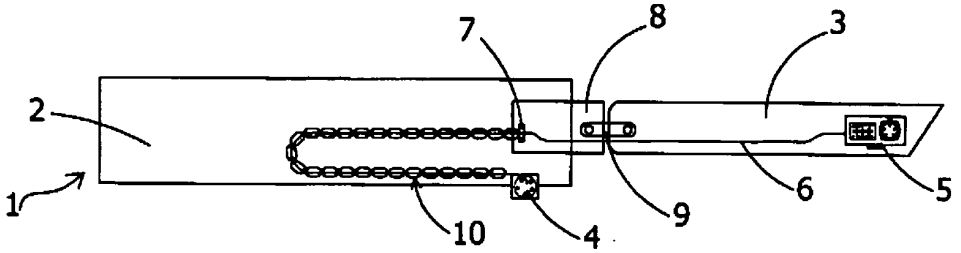


Fig. 2

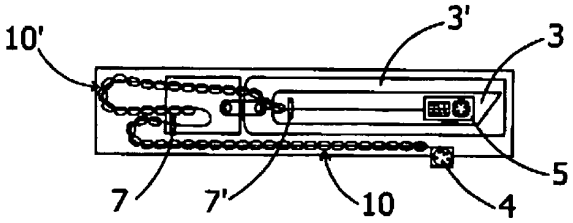


Fig. 3

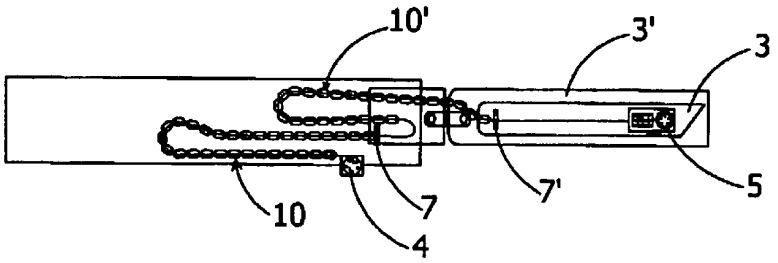


Fig. 4

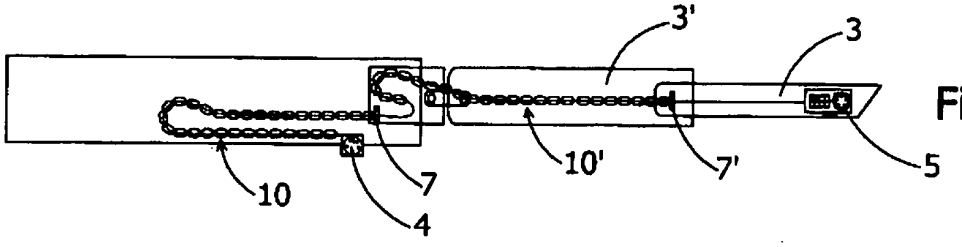


Fig. 5

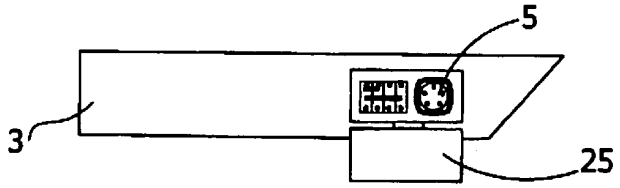


Fig. 6

Fig. 7

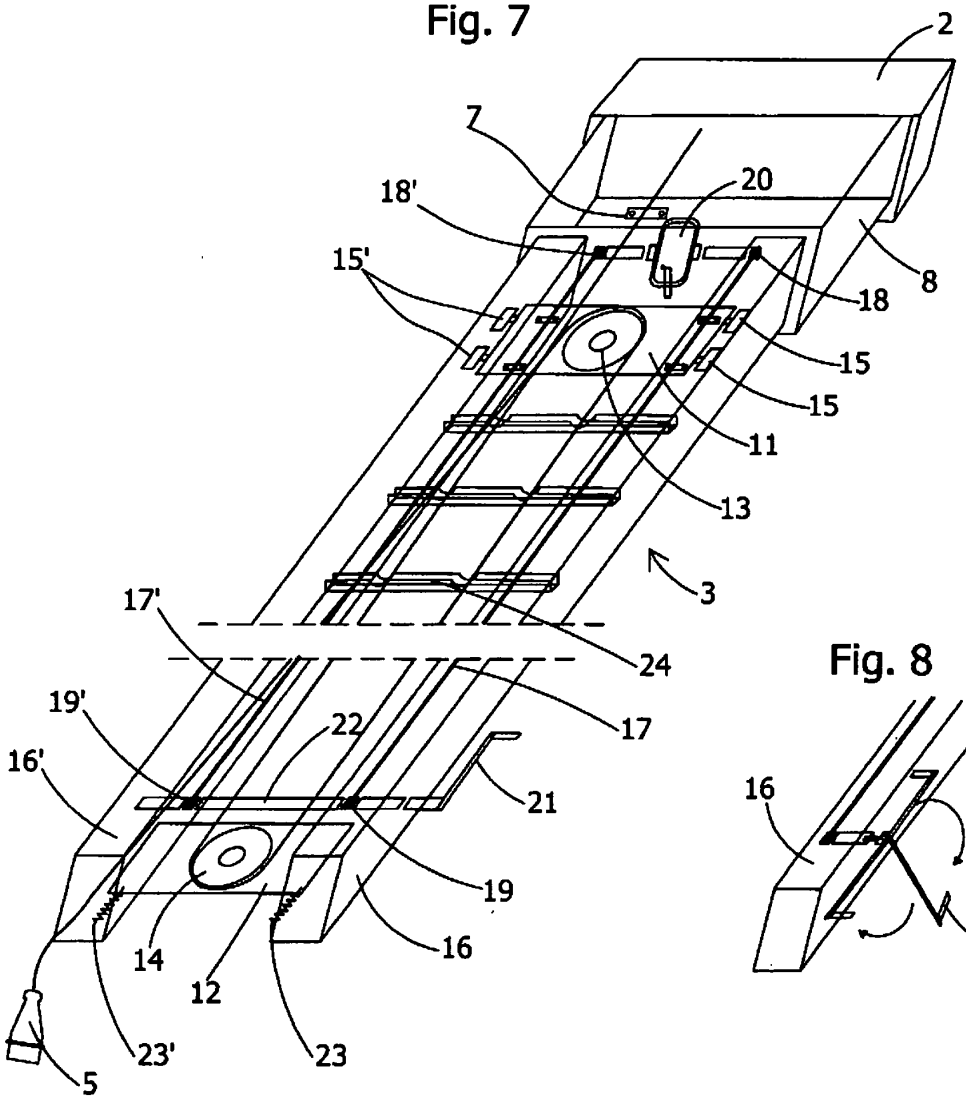


Fig. 8

Fig. 9

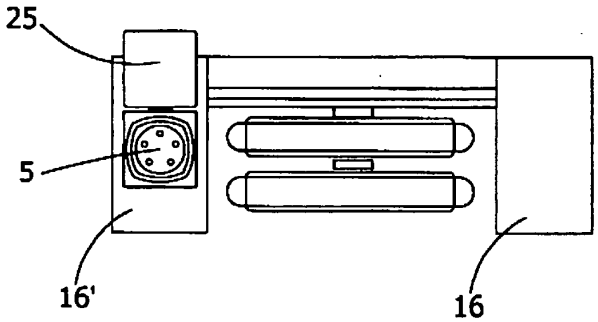


Fig. 10

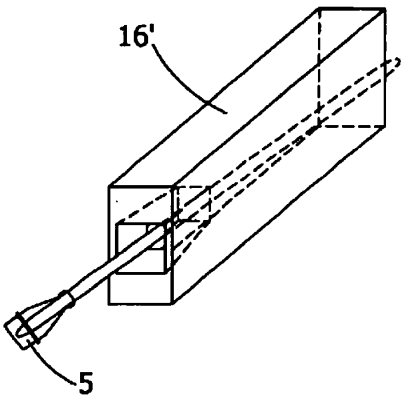


Fig. 11

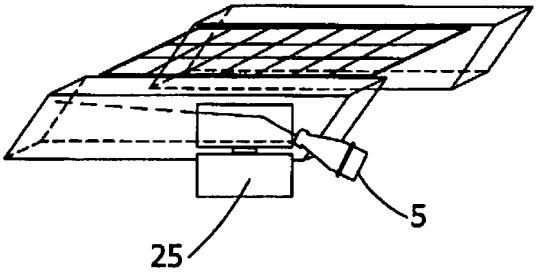


Fig. 12

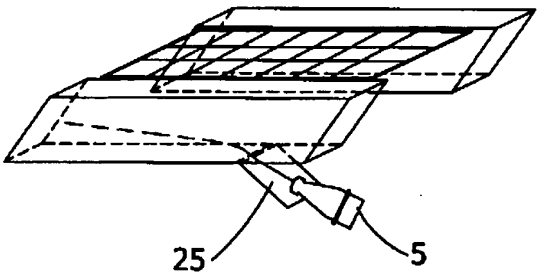


Fig. 13

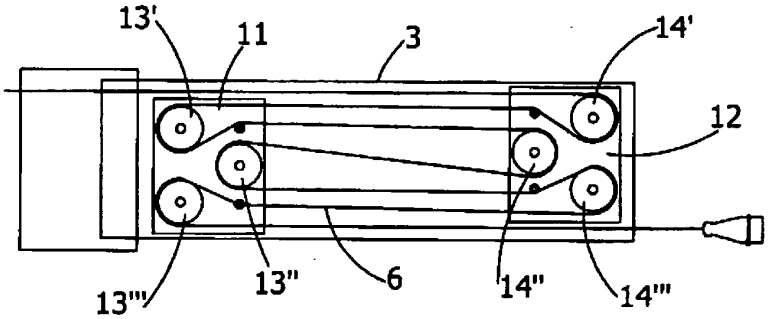


Fig. 14

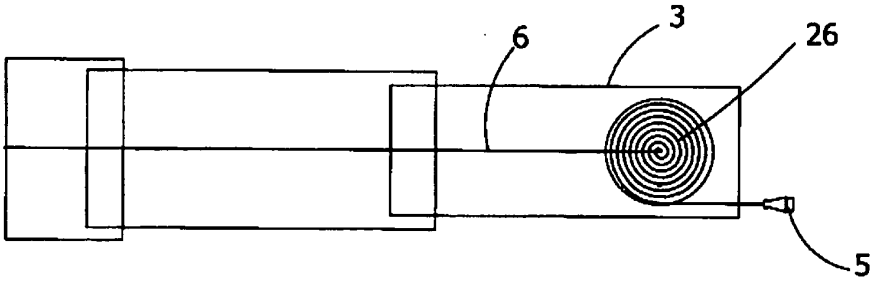


Fig. 15

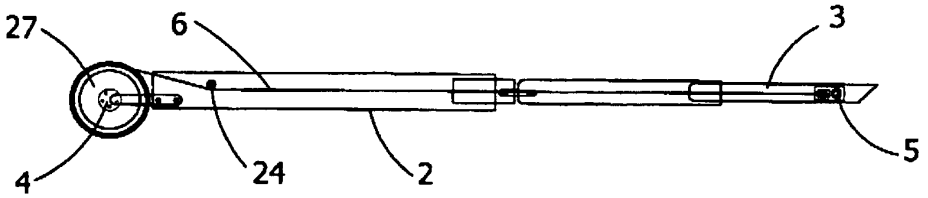
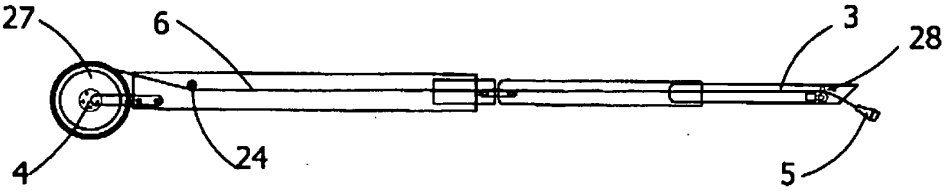


Fig. 16



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Patent documents cited in the description

- FR 2674212 **[0001]**