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(54) **INSTALLATION PACK AND ARRANGEMENT FOR INSTALLING A FLEXIBLE MEMBER IN AN ELEVATOR**

INSTALLATIONSPAKET UND ANORDNUNG ZUM INSTALLIEREN EINES FLEXIBLEN ELEMENTS
IN EINEM AUFZUG

ENSEMBLE D'INSTALLATION ET AGENCEMENT POUR INSTALLER UN ÉLÉMENT SOUPLE DANS
UN ASCENSEUR

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EP 2 758 331 B1

Description

[0001] The object of the invention is an installation pack as presented in the preamble of claim 1 and an arrangement as presented in claim 4 for installing in an elevator a flexible member, such as a hoisting member, a traction member or a current & data cable, of an elevator.

[0002] Nowadays the delivery of the flexible members of an elevator, such as the hoisting ropes of an elevator, is implemented in separate cardboard boxes, in which is a reel fabricated from wood and/or metal, onto which the flexible member is prewound. In the installation phase the reel is taken out of the packing case and fitted onto a separate installation rack functioning as a tool, from which the flexible member, such as rope, can be unreeling in order to prevent twisting of the flexible member. Twisting would produce abrupt loops that would make installation of the flexible member more difficult. When unreeling a flexible member, such as rope, the rotation of the reel must be restricted to prevent uncontrolled discharge of the rope from the reel when the reel rotates momentarily faster than the rope can be fed into the roping to be formed.

[0003] In the solutions known in the art the flexible members, such as ropes, of elevators are installed one at a time with a type of discharge device that is designed so that free rotation of the rope with the reeling device is prevented by the aid of spring force. In this case greater friction is achieved by tightening the spring and free discharge of the rope from the reel is prevented. Additionally, it is known for a helper to brake the reel e.g. manually or by the aid of some auxiliary device.

[0004] There are, however, significant drawbacks attached to prior art. Regulation of the discharge device described above is difficult and so it often happens that the flexible member, such as rope, either discharges too quickly or does not discharge at all. In addition, e.g. the simultaneous discharge of ropes with prior-art devices is difficult. Thus installation of the roping becomes more difficult and takes a lot of time. Another problem is the need for the aforementioned installation racks, because there is no other use for the installation racks. Nevertheless, very many installation racks are needed in connection with installation, because elevator models are often different and often many elevators are installed at one time. The storage of the aforementioned installation racks and their transfer from the store to the worksite and back to the store is both expensive and ecologically detrimental to the environment.

[0005] The JP 2002053271 A, the US 2003/0085080 A1 as well as the US 2006/0255203 A1 disclose an installation pack according to the preamble of claim 1.

[0006] The aim of the present invention is to eliminate the aforementioned drawbacks and to achieve a cheap, ecofriendly, operationally reliable and easily implemented arrangement for installing in an elevator a flexible member, such as a hoisting member, a traction member or a current & data cable, of an elevator. A hoisting mem-

ber and traction member can be e.g. a belt or a rope. Additionally the purpose of the invention is to achieve an ecofriendly installation pack of the flexible member, which pack can be delivered for recycling after use. The installation pack according to the invention is characterized by what is disclosed in claim 1 and the arrangement according to the invention is characterized by claim 4. Preferred embodiments of the invention are subject matter of the corresponding dependent claims.

[0007] Some inventive embodiments are also discussed in the descriptive section of the present application. Likewise the different details presented in connection with each embodiment can also be applied in other embodiments. In addition it can be stated that at least some of the subordinate claims can in at least some situations be deemed to be inventive in their own right.

[0008] By means of the invention significant advantages are achieved. Thus, the self-weight of a reel and a flexible member, such as a rope, ensures a reliable braking force is achieved. Since the discharge speed of a flexible member, such as a rope, from the reel in connection with installation can be e.g. approx. 10 m/s, or even more, it must be possible to stop the reel reliably immediately the discharge of the flexible member ends. When the reel is lowered onto the base of the packing case, the ratio of rotation force and weight is generally essentially constant in connection with braking.

[0009] One advantage of the solution according to the invention is also that the packing case of the flexible member simultaneously functions as an installation rack when the flexible member is unreeling to the disposal location. Thus surplus installation racks, storage locations of them, and also transfers of them between the installation location and the storage location are not needed at all because the packing case itself also functions as an installation rack.

[0010] Another advantage is that the aforementioned flexible members are all the time before installation in the packing case in a space that is well protected from humidity and dust and that does not need to be opened before installation. Another advantage is that both the reels and all the structures needed for protecting the reels and for reeling a flexible member into the disposal location are recyclable and environmentally benign. A further advantage is also that the reel according to the invention is very quickly deployed because separate installation racks are not needed.

[0011] In the following the invention will be described in more detail by the aid of some examples of its embodiment with reference to the attached simplified drawings, wherein

Fig. 1 presents an oblique view from the top and side of one installation pack according to the invention,

Fig. 2 presents a sectioned side view of one installation pack according to the invention, when the reel is in its first position,

- Fig. 3 presents a sectioned side view of one installation pack according to the invention, when the reel is in its second position,
- Fig. 4 presents a front view of one installation pack according to the invention,
- Fig. 5 presents an installation pack according to the invention, as viewed from the side of the side wall of the packing case, and
- Fig. 6 presents an arrangement comprising two packing cases.

[0012] The idea of the solution according to the invention is that for installation purposes a flexible member 2, such as a suspension member, a hoisting member, a traction member or a current & data cable of an elevator, wound onto a reel 6 is delivered to the installation work-site in an installation pack, which comprises at least a packing case 1, inside which is the flexible member 2 wound onto a reel 6. The flexible member 2, being a suspension member, hoisting member and traction member, is e.g. a belt or a rope, which rope is preferably essentially small in diameter, i.e. a so-called thin rope, e.g. approx. 3-8 mm in diameter, suitably e.g. approx. 4 mm. The packing case 1 forms a storage-time and transportation-time protection and, in addition, during the installation supports the reel 6 in its position while allowing it to rotate, forming an installation-time installation rack, in which case a separate installation rack is not needed for supporting the reel 6 in its position while allowing it to rotate. In practice a number of these types of installation packs are placed side-by-side on a level in the building, such as on a floor level or on the floor of the elevator hoistway or of the machine room, in the installation phase of the elevator, and the flexible member 2 on the reel 6 is pulled by unreeling into the elevator system, e.g. by threading the flexible member 2, such as a suspension rope, from the reel 6 directly onto the diverting pulleys of the elevator.

[0013] Fig. 1 presents an oblique top and side view of one installation pack according to the invention, which comprises at least a packing case 1 and inside it a reel 6, onto which the flexible member 2 to be installed, such as a suspension member, a hoisting member, a traction member or a current & data cable of an elevator, is wound. The packing case 1 comprises at least a lid, a base, a front side wall 1a, a rear side wall and side walls 1b, and at least both the base and the side walls 1b are preferably reinforced. Both side walls 1b have an aperture 3 pointing obliquely downwards in two directions, the first end of which aperture points obliquely downwards towards the front wall 1a of the packing case 1 and the second end of which aperture points obliquely downwards towards the rear wall of the packing case 1. The reel 6 is configured to be supported by its shaft 7 in the aperture 3 of the side walls 1b. The apertures 3 function as installation means and as a rotational support for supporting the reel in a manner that allows rotation inside the packing case 1. Instead of apertures 3, the rotational

supports of the rotating shaft 7 can also be fitted entirely inside the packing case 1 on the inside surface of both side walls 1b. In this case the aforementioned inside surfaces can have grooves the shape of the aperture 3, which grooves do not, however, extend through the side wall 1b to the outside of the side wall 1b. In addition, the front wall 1a of the packing case 1 has an aperture 5, which comprises an openable lid part 4, which is opened during the installation of the flexible member 2 so that the flexible member 2 is able to discharge from the reel 6 to the disposal location.

[0014] The whole installation pack is made from environmentally benign recycling materials, which can be delivered for recycling after installation of the flexible member 2. The packing case 1, which is essentially a rectangular prism in shape, is a material composed of vegetable fiber, preferably of wood fiber, such as cardboard, e.g. corrugated cardboard, which is folded into the necessary number of layers one on top of another. Correspondingly, the body of the reel 6 is fabricated from vegetable fibers, preferably from wood fibers pressed together or from another type of cardboard, or also from wood. Additionally, the shaft 7 of the reel 6 is also fabricated from vegetable fibers, preferably e.g. from wood fibers pressed together, or the shaft can also be a shaft turned from wood.

[0015] Figs. 2 and 3 present a sectioned side view of one installation pack according to the invention. In the situation according to Fig. 2, the reel 6 is in its first position inside the packing case 1 detached from the inside base 8 of the packing case. In this case the reel 6 is supported by its shaft 7, in a manner that allows essentially free rotation, in the first end of the apertures 3. This position allows the reel 6 to rotate essentially freely. If, however, braking is needed for the rotating of the reel 6, the reel 6 can be disposed in its second position presented by Fig. 3 such that the shaft 7 of the reel 6 is shifted to the second end of the aperture 3, which second end is lower than the first end. In this case the outer rim of the reel 6 hits the inside base 8 of the packing case 1, in which case the friction produced by abrasive contact suitably brakes the rotation of the reel 6.

[0016] Fig. 4 presents one installation pack according to the invention, as viewed from the front of the packing case 1. From Fig. 4 it is clearly seen how the ends of the rotating shaft 7 of the reel 6 extend in both directions out from the side walls 1b of the packing case 1 while resting on the apertures 3 that are in the side walls 1b and that are a resting support and rotational support of the rotating shaft 7.

[0017] Fig. 5 presents in more detail a side wall 1b of a packing case 1 of an installation pack according to the invention, as viewed from the side. The aperture 3 in the side wall 1b, said aperture supporting the shaft 7 of the reel 6, has two branches, which branches both point obliquely downwards. The first end 3a of the aperture 3 points obliquely downwards towards the front wall 1a of the packing case 1 and the second end 3b of the aperture 3 points obliquely downwards at essentially the same

angle towards the rear wall of the packing case 1. The first end 3a of the aperture 3 is shorter than the second end 3b, so that the first end 3a of the aperture 3 is farther from the inside base 8 of the packing case 1 than the second end 3b of the aperture 3. The distance of the aperture 3 from the inside base 8 is dimensioned in relation to the diameter of the reel 6 to be such that when the shaft 7 of the reel 6 is at the first end 3a of the aperture 3, the outer rim of the reel 6 is detached from the inside base 8 of the packing case 1 and correspondingly when the shaft 7 of the reel 6 is at the second end 3b of the aperture 3, the outer rim of the reel 6 rests at the same time on the inside base 8 of the packing case 1 for achieving a braking effect on the rotation of the reel 6.

[0018] In the installation pack and in the arrangement according to the invention one or more packing cases 1 with reel(s) 6 are disposed in the installation phase of the flexible members 2 side-by-side on a level of a building, such as on a floor level, on the floor of the elevator hoistway or on the floor of the machine room, and all the flexible members 2 to be installed in the same context are fed into the elevator system at the same time by discharging the flexible member 2 from reels 6 rotating in their position inside a packing case 1 to be used as a reeling rack e.g. by pulling the flexible member 2 out of the packing case 1 with the elevator's own machine or with another suitable machine.

[0019] Before the discharging of the flexible member 2 from the packing case 1 the rotating shaft 7 of the reel 6 is disposed in the first end 3a of the aperture 3, after which the reel 6 is rotated in the first end 3a of the aperture 3 by pulling the flexible member 2 out from the reel 6. The rotation of the reel 6 is braked, if necessary, by shifting the rotating shaft 7 of the reel 6 to the second end 3b of the aperture 3 and by letting the outer rim 6a of the reel 6 rotate against the inside base 8 of the packing case 1.

[0020] The reel 6 is rotated inside the packing case 1 while supported on the packing case 1 for essentially the whole time of feeding in the flexible member 2. When the reel 6 is rotating in the first end 3a of the aperture 3, the reel 6 is supported via its shaft 7 on the aperture 3 and at the same time on the side walls 1b of the packing case 1, and when the reel 6 is rotating in the second end 3b of the aperture 3, the reel 6 is mainly supported on the inside base 8 of the packing case 1, but receives its guidance from the aperture 3. After the feeding in of the flexible members 2 and when the reels 6 are empty, the packing cases 1 with their reels 6 and shafts 7 are delivered for recycling.

[0021] It should also be noted that the different solutions presented above can be inventive features together with one or more other features of the invention.

[0022] It is obvious to the person skilled in the art that the invention is not limited solely to the examples described above, but that it may be varied within the scope of the claims presented below. Thus, for example, the shape, structure and operation of the packing case and

reel as well as of the rotating shaft can also be different to what is presented above.

[0023] It is also obvious to a person skilled in the art that the reel can, if necessary, be braked otherwise than by letting the outer rim of the reel abrade the inside base of the packing case. The side walls of a packing case can e.g. at a suitable point have holes, into which can be placed cardboard or wooden pins, against which the reel can, by suitable shifting, be made to rotate.

Claims

1. Installation pack of a flexible member (2), such as a rope, belt or cable, of an elevator, which installation pack comprises a packing case (1), inside which is a reel (6), onto which a flexible member (2) of an elevator is wound, which installation pack comprises means (3, 7) for supporting the reel (6) in its position in a manner that allows rotation inside the packing case (1), whereby the means (3, 7) for supporting the reel (6) in its position in a manner that allows rotation inside the packing case (1) comprise at least a rotating shaft (7) and a rotational support, being an edge of an aperture (3) in both side walls of the packing case (1), on which rotational support the rotating shaft (7) is disposed to rest, **characterized in that** the aperture (3) is arranged to point obliquely downwards in two directions such that a first end (3a) of the aperture (3) points obliquely downwards towards the front wall (1a) of the packing case (1) and a second end (3b) of the aperture (3) points obliquely downwards towards the rear wall of the packing case (1), and **in that** the second end (3b) of the aperture (3) is closer to the inside base (8) of the packing case (1) than the first end (3a) of the aperture (3).
2. Installation pack according to claim 1, **characterized in that** the distance of the first end (3a) of the aperture (3) from the inside base (8) of the packing case (1) is configured to be greater than the diameter of the reel (6) such that the reel (6) can rotate around the shaft (7) disposed in the first end (3a) of the aperture (3) without touching the inside base (8) of the packing case (1), and **in that** the distance of the second end (3b) of the aperture (3) from the inside base (8) of the packing case (1) is configured to be such, in relation to the diameter of the reel (6), that when the shaft (7) of the reel (6) is disposed in the second end (3b) of the aperture (3) the outer rim of the reel (6) hits the inside base (8) of the packing case (1).
3. Installation pack according to any of the preceding claims 1 to 2, **characterized in that** the packing case (1), reel (6) and its rotating shaft (7) are of recycling material fabricated from vegetable fibers, preferably material fabricated from wood fibers, such as cardboard, material pressed from wood fibers and/or

wood.

4. Arrangement comprising one or more installation packs according to one of the claims 1 to 3, wherein the reel (6) is supported in its position in a manner allowing rotation inside the packing case (1) when pulling the flexible member (2) from the reel (6) into an elevator system.
5. Arrangement according to claim 4, **characterized in that** for feeding the flexible member (2) into the elevator, the rotating shaft (7) of the reel (6) is disposed in the first end (3a) of the aperture (3), and **in that** when braking of the rotation of the reel (6) is needed, the rotating shaft (7) of the reel (6) is disposed in the second end (3b) of the aperture (3), which second end is closer to the inside base (8) of the packing case (1) so that the outer rim (6a) of the reel (6) extends against the inside base (8) of the packing case (1).

Patentansprüche

1. Installationspack eines flexiblen Elements (2), wie z. B. eines Seils, eines Bandes oder eines Kabels eines Aufzugs, welches Installationspack ein Verpackungsgehäuse (1) aufweist, in welchem eine Rolle (6) angeordnet ist, auf welche das flexible Element (2) des Aufzugs gewickelt wird, welches Installationspack Mittel (3, 7) zur Unterstützung der Rolle (6) in ihrer Position enthält, in einer Weise, die eine Rotation innerhalb des Verpackungsgehäuses (1) erlaubt, wobei die Mittel (3, 7) zum Unterstützen der Rolle (6) in ihrer Position in einer Weise, die eine Rotation innerhalb des Verpackungsgehäuses (1) erlaubt, wenigstens eine Rotationswelle (7) umfasst und eine Rotationsunterstützung umfassen, welche eine Kante einer Öffnung (3) in beiden Seitenwänden des Verpackungsgehäuses (1) ist, auf welcher die Rotationsunterstützung die rotierende Welle (7) aufliegen kann, **dadurch gekennzeichnet, dass** die Öffnung (3) derart ausgebildet ist, dass sie schräg nach unten in zwei Richtungen weist, so dass ein erstes Ende (3a) der Öffnung (3) schräg nach unten zu der Vorderwand (1a) des Verpackungsgehäuses (1) weist und ein zweites Ende (3b) der Öffnung (3) schräg nach unten in Richtung auf die Rückwand des Verpackungsgehäuses (1) weist, und dass das zweite Ende (3b) der Öffnung (3) näher an der Innenbasis (8) des Verpackungsgehäuses (1) als das erste Ende (3a) der Öffnung (3) ist.
2. Installationspack nach Anspruch 1, **dadurch gekennzeichnet, dass** der Abstand des ersten Endes (3a) der Öffnung (3) von der Innenbasis (8) des Verpackungsgehäuses (1) größer als der Durchmesser der Rolle (6) ist, so dass die Rolle (6) um die in dem

ersten Ende (3a) der Öffnung (3) angeordnete Welle (7) rotieren kann, ohne die Innenbasis (8) des Verpackungsgehäuses (1) zu berühren, und dass der Abstand des zweiten Endes (3b) der Öffnung (3) von der Innenbasis (8) des Verpackungsgehäuses (1) derart ist, dass in Bezug auf den Durchmesser der Rolle (6), wenn die Welle (7) der Rolle auf dem zweiten Ende (3b) der Öffnung (3) ruht, die Außenkante der Rolle (6) die Innenbasis (8) des Verpackungsgehäuses (1) trifft bzw. berührt.

3. Installationspack nach einem der vorhergehenden Ansprüche 1 und 2, **dadurch gekennzeichnet, dass** das Verpackungsgehäuse (1), die Rolle (6) und ihre Rotationswelle (7) aus einem Recyclingmaterial bestehen, das aus Gemüsefasern hergestellt ist, insbesondere Material aus Holzfasern hergestellt ist, wie z.B. Pappe bzw. Material das aus Holzfasern und/oder Holz gepresst ist.
4. Anordnung umfassend ein oder mehrere Installationspacks nach einem der Ansprüche 1-3, in welcher die Rolle (6) in ihrer Position getragen ist in einer Weise, die eine Rotation innerhalb des Verpackungsgehäuses (1) erlaubt, wenn das flexible Element (2) von der Rolle (6) in ein Aufzugssystem gezogen wird.
5. Anordnung nach Anspruch 4, **dadurch gekennzeichnet, dass** zum Zuführen des flexiblen Elements (2) in den Aufzug die Rotationswelle (7) der Rolle (6) an dem ersten Ende (3a) der Öffnung (3) angeordnet ist, und dass, wenn ein Abbremsen der Rotation der Rolle (6) benötigt wird, die Rotationswelle (7) der Rolle (6) an dem zweiten Ende (3b) der Öffnung angeordnet wird, welches zweite Ende näher an der Innenbasis (8) des Verpackungsgehäuses (1) angeordnet ist, so dass die Außenkante (6a) der Rolle (6) sich gegen die Innenbasis (8) des Verpackungsgehäuses erstreckt.

Revendications

1. Ensemble d'installation d'un élément souple (2), tel qu'une corde, une courroie ou un câble, d'un ascenseur, lequel ensemble d'installation comprend une caisse d'emballage (1), à l'intérieur de laquelle est situé un touret (6), sur lequel est enroulé un élément souple (2) d'un ascenseur, lequel ensemble d'installation comprend des moyens (3, 7) pour supporter le touret (6) dans sa position d'une manière qui permet la rotation à l'intérieur de la caisse d'emballage (1), dans lequel les moyens (3, 7) pour supporter le touret (6) dans sa position d'une manière qui permet la rotation à l'intérieur de la caisse d'emballage (1) comprennent au moins un arbre de rotation (7) et un support de rotation, étant un bord d'une ouverture

(3) dans les deux parois latérales de la caisse d'emballage (1), sur lequel support de rotation l'arbre de rotation (7) est disposé pour s'appuyer, **caractérisé en ce que** l'ouverture (3) est agencée pour se diriger obliquement vers le bas dans deux directions de telle manière qu'une première extrémité (3a) de l'ouverture (3) se dirige obliquement vers la paroi avant (1a) de la caisse d'emballage (1) et une seconde extrémité (3b) de l'ouverture (3) se dirige obliquement vers le bas vers la paroi arrière de la caisse d'emballage (1), et **en ce que** la seconde extrémité (3b) de l'ouverture (3) est plus près de la base intérieure (8) de la caisse d'emballage (1) que la première extrémité (3a) de l'ouverture (3).

ture (3), laquelle seconde extrémité est plus près de la base intérieure (8) de la caisse d'emballage (1) de telle sorte que la jante extérieure (6a) du touret (6) s'étend vers la base intérieure (8) de la caisse d'emballage (1).

2. Ensemble d'installation selon la revendication 1, **caractérisé en ce que** la distance de la première extrémité (3a) de l'ouverture (3) depuis la base intérieure (8) de la caisse d'emballage (1) est configurée pour être supérieure au diamètre du touret (6) de telle sorte que le touret (6) peut tourner autour de l'arbre (7) disposé dans la première extrémité (3a) de l'ouverture (3) sans toucher la base intérieure (8) de la caisse d'emballage (1), et **en ce que** la distance de la seconde extrémité (3b) de l'ouverture (3) depuis la base intérieure (8) de la caisse d'emballage (1) est configurée pour être telle, par rapport au diamètre du touret (6), que, lorsque l'arbre (7) du touret (6) est disposé dans la seconde extrémité (3b) de l'ouverture (3), la jante extérieure du touret (6) atteint la base intérieure (8) de la caisse d'emballage (1).
3. Ensemble d'installation selon l'une quelconque des revendications précédentes 1 à 2, **caractérisé en ce que** la caisse d'emballage (1), le touret (6) et son arbre de rotation (7) sont constitués de matériau recyclé fabriqué à partir de fibres végétaux, préférentiellement un matériau fabriqué à partir de fibres de bois, telles que du carton, un matériau compressé en fibres de bois et/ou du bois.
4. Agencement comprenant un ou plusieurs ensembles d'installation selon l'une des revendications 1 à 3, dans lequel le touret (6) est supporté dans sa position d'une manière permettant la rotation à l'intérieur de la caisse d'emballage (1) en tirant l'élément souple (2) dans le système d'ascenseur depuis le touret (6).
5. Agencement selon la revendication 4, **caractérisé en ce que** pour introduire l'élément souple (2) dans l'ascenseur, l'arbre de rotation (7) du touret (6) est disposé dans la première extrémité (3a) de l'ouverture (3), et **en ce que**, lorsque le freinage de la rotation du touret (6) est nécessaire, l'arbre de rotation (7) du touret (6) est disposé dans la seconde extrémité (3b) de l'ouver-

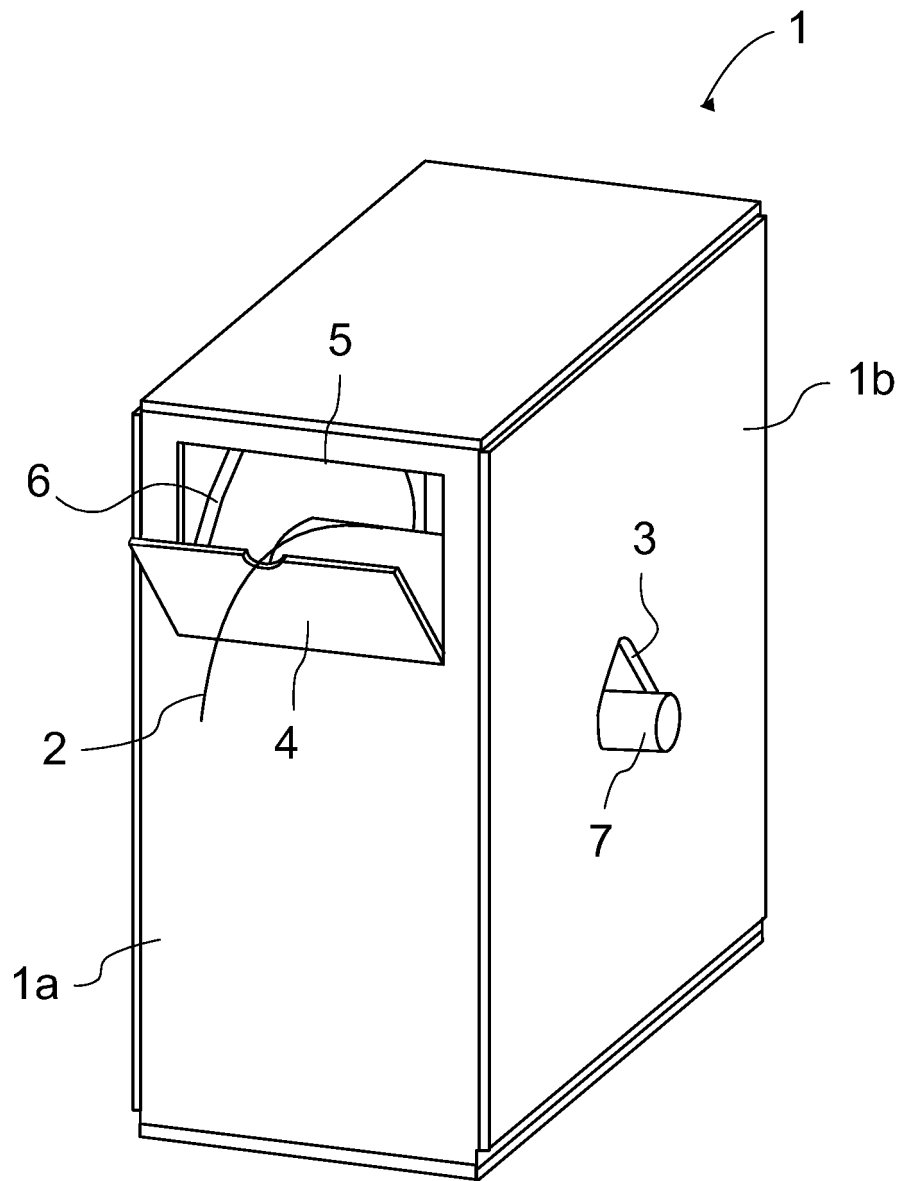
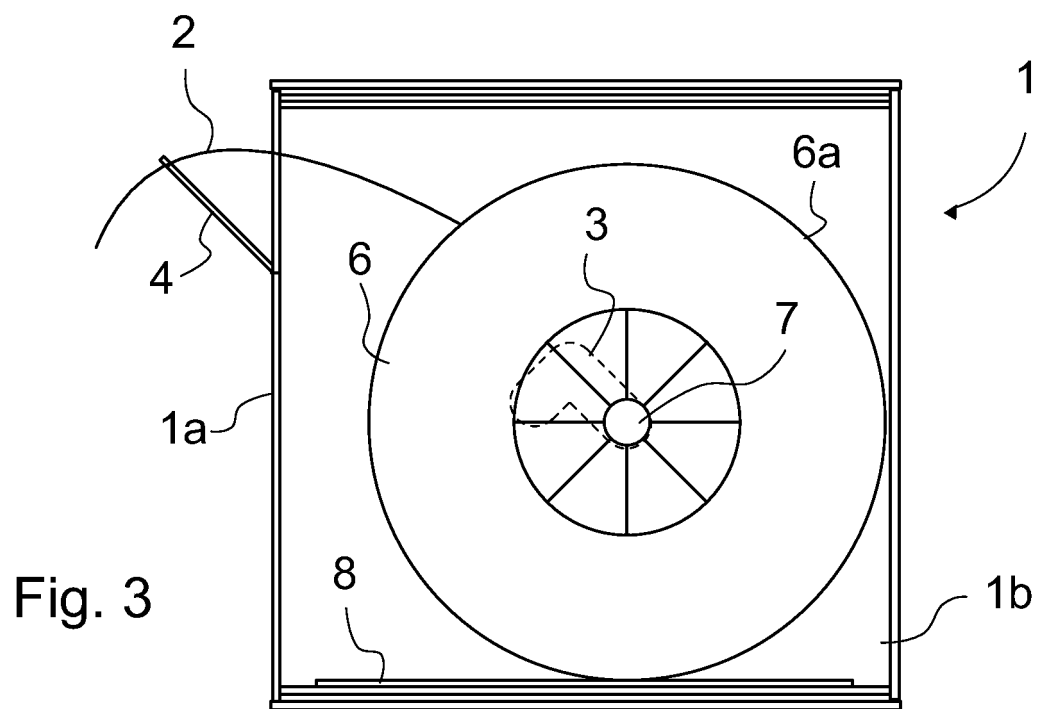
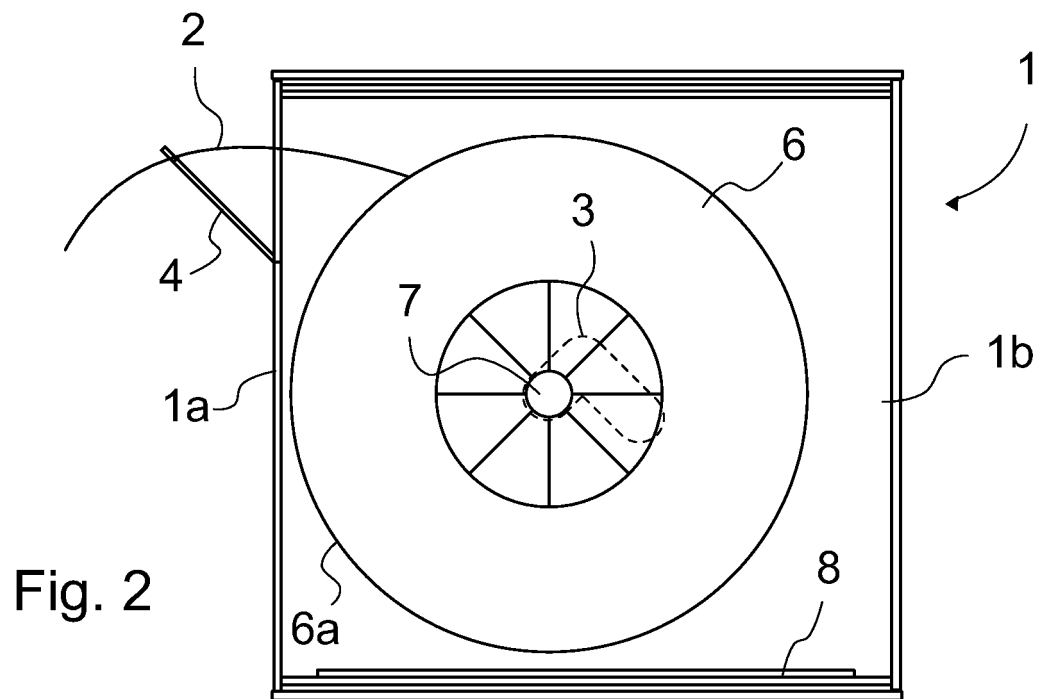
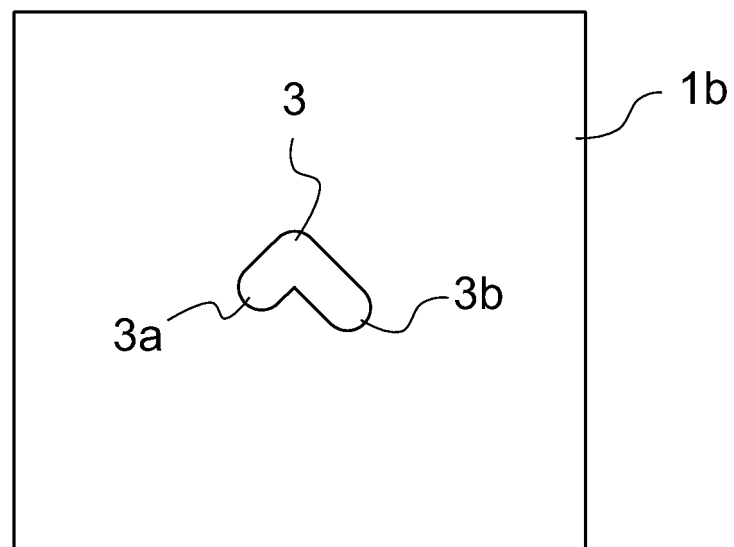
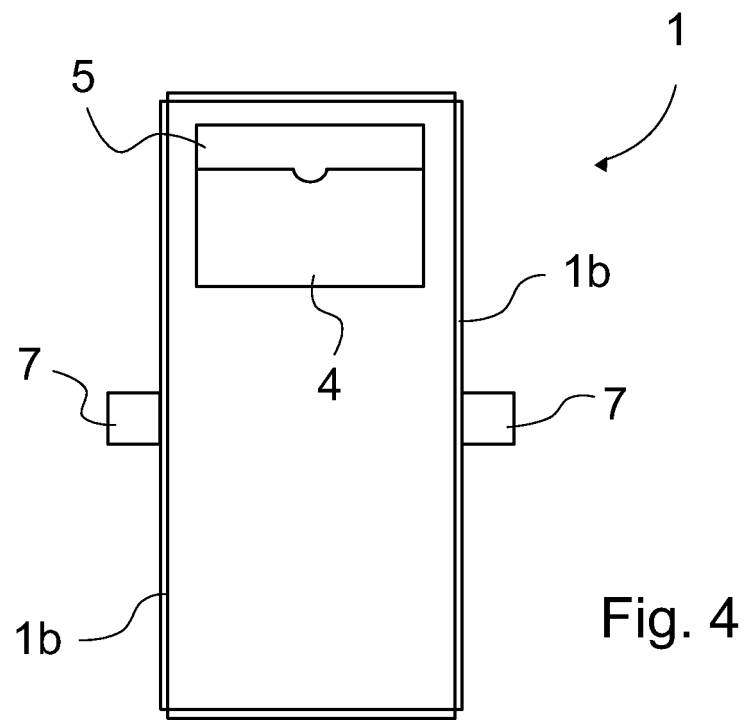


Fig. 1





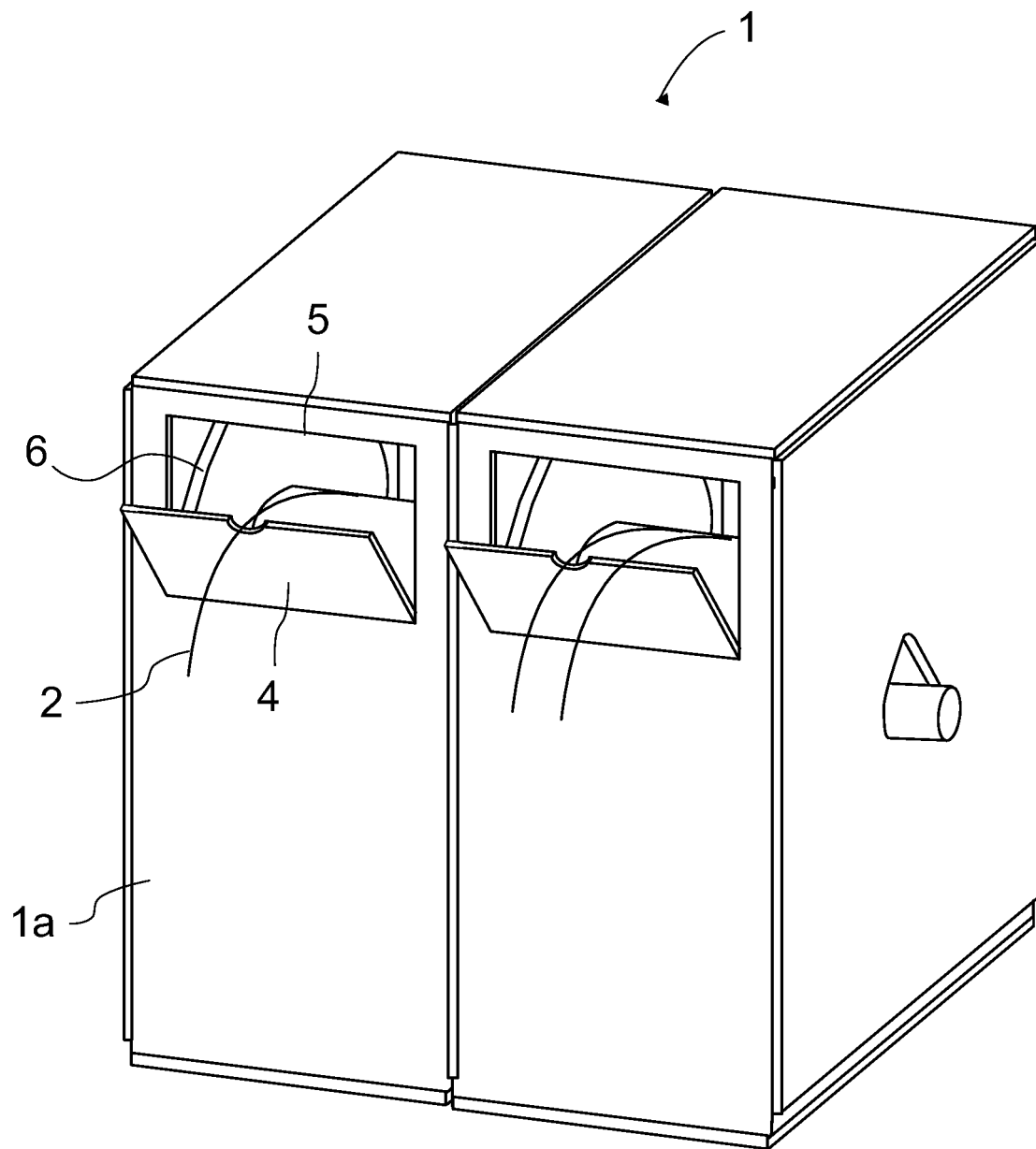


Fig. 6

REFERENCES CITED IN THE DESCRIPTION

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