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(54) **An arrangement for mounting a radiator on a substrate**

Befestigungseinrichtung eines Heizkörpers an einer Oberfläche

Dispositif de fixation d'un radiateur sur une surface

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Description

TECHNICAL FIELD

[0001] The present invention relates to an arrangement for mounting a radiator with two radiator elements on a substrate, the radiator having a downwardly open accommodation space extending in its vertical direction, the arrangement comprising: a base section fixable in the substrate, an upright extending upwards from the base section and disposed to extend up into the accommodation space, a first anchorage supported by the upright and designed for cooperation with a first portion of the radiator, a second anchorage which may be accommodated in the accommodation space for cooperation with a second portion of the radiator, the second portion being located above the first portion, and the second anchorage having an open position and a locking position for positionally fixing cooperation with the radiator, spring means for pre-tensioning the second anchorage in a direction towards its locking position, and a locking device for locking the second anchorage in the locking position, the locking device being functionally interconnected with the second anchorage by the intermediary of a transmission device, and having an operating member located outside the accommodation space.

BACKGROUND ART

[0002] Radiators for water-borne heat can be designed as single element radiators or be composed of a plurality of radiator elements to form duplex radiators, triplex radiators, etc. A single element radiator and each radiator element has upper and lower, substantially horizontal water channels between which extend vertical water channels. The spacing between the vertical water channels is, as standard, 25, 33 or 40 mm. In composite radiators, it is a common occurrence that convector plates are provided in between the radiator elements, as a rule one set for each radiator element. Correspondingly, the single element radiator generally displays convector plates on its rear side. The design of the convector plates may vary greatly from one manufacturer to another, for which reason both their dimensioning and location may vary. Furthermore, there are many designs and constructions in which the convector plates take up considerable space and are located closely together so that the available space for inserting, in a composite radiator between its radiator elements, an anchorage device for securing the radiator may be extremely limited.

[0003] Radiators of the type under consideration here are often provided with safety plates along their vertical side edges and on the upper side. This implies that if an anchorage device for mounting the radiator on the substrate is located concealed in between the radiator elements, it cannot be accessed from the side walls of the radiator or its upper side.

[0004] Furthermore, the radiators are generally supplied

ready-painted and packed in a protective transport package out to the worksite. When the radiators are mounted in place, the intention is to retain the transport packaging on the radiator, preferably even after the radiator has been mounted in place. Consequently, there is a considerable need in the art that the anchorage arrangement must be able to be pushed straight through the transport packaging at the underside of the radiator and up into an accommodation space interiorly in the radiator, where the accommodation space may be limited or defined by radiator elements or convector plates included in the radiator. Thus, in the mounting operation, the aim is that the transport packaging should not be unnecessarily damaged or need to be removed.

[0005] DE 4 440 746 discloses an anchorage element with a tube-shaped upright with a rectangular cross-section. At the upper end of the upright, there is an anchorage with a horizontally extending bore having longitudinal slit. The bore can be compressed so that two spring-biased pins in the bore are fixed in their respective positions. The pins abut two facing surfaces of a radiator to hold it in its place.

[0006] A major disadvantage of the construction according to DE 4 440 746 is that it requires access from above for its mounting. Thus it cannot be used when the radiator has an upper cover plate fixed in its position, for instance by the transport packaging.

[0007] The anchorage arrangement according to EP 723 118 A1 has a base section fixable in a substrate and from which an upright extends upwards and, in its upper end, has an upper anchorage. The upper anchorage is insertable from beneath into an accommodation space in the radiator and has an open position and a position which secures the radiator. The upper anchorage is manoeuvrable by the intermediary of a rod shiftably disposed in the upright which, by means of a gear wheel arrangement at the lower end of the upright, is displaceable in the vertical direction in the upright.

[0008] The anchorage arrangement according to the above publication further displays a lower anchorage secured in the upright which cooperates with a lower edge portion of the radiator.

[0009] The anchorage arrangement further has a locking mechanism which is intended for locking the upper anchorage in its locking position but also for locking the lower anchorage in a position chosen and adjusted for it in response to the dimensions of the radiator.

[0010] The above-outlined construction functions satisfactorily in many contexts, but because of the separate operating device for the upper anchorage, it is necessary, on mounting a radiator in place, to employ two different tools at the same time. First, the operating device for the upper anchorage must be activated so that the upper anchorage is brought to its locking position and retained there. Secondly, the upper and lower anchorages must be locked in locking position and in chosen adjustment position, respectively, before the radiator may be considered as mounted in place.

PROBLEM STRUCTURE

[0011] The present invention has for its object to develop the anchorage arrangement described by way of introduction such that its operation and use are simplified without jeopardising its reliable function. Further, the present invention has for its object to realise an anchorage arrangement which is simple and economical in manufacture.

SOLUTION

[0012] The objects forming the basis of the present invention will be attained if the anchorage arrangement intimated by way of introduction is characterized in that the spring means is operative to actuate the second anchorage by the intermediary of the transmission device.

[0013] As a result of this distinguishing feature, the need for a special operating device for transferring the upper anchorage between its open position and its locking position is obviated.

[0014] According to one preferred embodiment of the present invention, it moreover applies that the locking device is located outside the accommodation space and is functionally interconnected to the second anchorage via a transmission device.

[0015] It further suitably applies according to the present invention that the locking device is common to both the first and the second anchorage.

[0016] As a result of the above-considered features, the advantages afforded will be convenience in the operation of the arrangement according to the present invention and also simple design and construction.

BRIEF DESCRIPTION OF THE ACCOMPANYING DRAWINGS

[0017] The present invention will now be described in greater detail hereinbelow, with particular reference to the accompanying Drawings. In the accompanying Drawings:

Fig. 1 shows a duplex radiator mounted on the arrangement according to the present invention which, for the purpose of clarity, is shown in a partly cut-away view;

Fig. 2 is a vertical view of the arrangement according to the present invention in which the first anchorage device is fully pivoted outwards;

Fig. 3 is a side elevation of a part of the arrangement according to the present invention according to the arrow A in Figs. 1 and 2; and

Fig. 4 is a cross section through the arrangement according to the present invention taken along the section line B-B in Fig. 2.

DESCRIPTION OF PREFERRED EMBODIMENT

[0018] In Fig. 1, reference numeral 1 relates to a duplex radiator which is seen from its end wall and which is composed of two radiator elements 2 and 3. The two radiator elements 2 and 3 are interconnected with each other by the intermediary of pipe couplings 4 and 5 so that there is formed between an accommodation space 6 which is at least open downwards. The radiator 1 is secured by means of the arrangement according to the present invention a distance above a substrate 7.

[0019] In Fig. 1, a duplex radiator is shown which, according to the Figure, has no convector plates. However, there are generally also provided on duplex radiators convector plates which are disposed on the sides of the two radiator elements 2 and 3 turned to face towards one another. This implies that the accommodation space 6 may have varying configuration and, in the longitudinal direction of the radiator, at right angles to the plane of the paper of Fig. 1, be quite narrow. In any event, the accommodation space is defined or limited by two substantially vertical and mutually approximately parallel surfaces which, in the embodiment according to Fig. 1, are to be found on the two radiator elements 2 and 3.

[0020] In such radiators as display the above-mentioned convector plates, the accommodation space may, however, also be limited by a radiator and a convector plate or possibly between two convector plates. According to the present invention, it is of no major importance how the accommodation space is limited or defined, as long as it has two opposing sides with which the arrangement according to the present invention may engage and as long as it is sufficiently large for accommodating at least an upper portion of the arrangement according to the present invention.

[0021] Taken from Figs. 1 and 4 together, it will be apparent that the arrangement according to the present invention has a lower base section 8 which, via an anchorage plate 9, is secured in the substrate 7. From the base section 8, an upright 10 extends upwards and is at least partly accommodated in the accommodation space 6. The upright 10 is composed of two plates 11 and 12 which form a space between them. The plates abut against each other along their vertical side edges and are joined together at the side edges, at least partly along their longitudinal extent.

[0022] The base section 8 is also formed by the two above-mentioned plates 11 and 12, and the base section also has an inner space 13 whose purpose will be described below. In the lower edge of the base section 8, the plates 11 and 12 included in the base section are outwardly flared from one another so that the above-mentioned anchorage plate 9 is thereby formed. It will be apparent from the foregoing that the upright, the base section and the anchorage plate are manufactured from two mutually joined plate parts. It will further be apparent from Fig. 4 that the anchorage plate 9 has an embossing

14 for purposes of rigidification.

[0023] The upright 10 supports or serves as an anchorage for a first anchorage 15 which is disposed for cooperation with a first portion of the radiator. In one preferred embodiment, the first anchorage is a lower anchorage and cooperates with lower edge portions of the radiator 1.

[0024] According to the present invention, the anchorage arrangement also has a second anchorage which is insertable in the accommodation space 6 and which there cooperates with a second portion of the radiator 1. The second anchorage 16 is located vertically above the first anchorage, and so the second portion of the radiator is also located over its first or lower portion.

[0025] The lower anchorage 15 is adjustable in response to the dimensions of the radiator and is thus vertically adjustable, depending upon the vertical extent of the radiator, along the longitudinal extent of the upright 10. Furthermore, the first anchorage is adjustable in the width direction, corresponding to the width of the radiator, transversely of the longitudinal direction of the upright 10 so that the first anchorage 15 may thereby cooperate with radiators in which the distance between the radiator elements 2 and 3 may vary. The first anchorage may further be designed in such a manner that it engages with lower portions of convector plates (not shown in the Drawings). Combinations may also occur in which the lower anchorage engages with, on the one hand, a radiator element and, on the other hand, with a convector plate or possibly with anchorages specifically provided on the radiator.

[0026] The second anchorage 16, which, thus, in the preferred embodiment is placed at an upper portion of the upright 10, has a locking position for positionally fixing cooperation with the radiator 1, and an open position in which the radiator may be mounted on the arrangement according to the present invention. In its most generic form, the present invention entails that the second anchorage is spring-biased towards the locking position and is fixedly lockable in this position by means of a locking device which is actuable from outside the accommodation space 6 and is preferably a slight distance under it.

[0027] The second, or upper, anchorage 16 includes two pivotal arms 17 and 18 which, by the intermediary of joints 19 and 20, are secured in the upright 10. The arms 17 and 18 are pivotal in opposite directions away from one another and laterally out from the upright 10 between a retracted position where the distance between the lower ends of the arms 17 and 18 is less than that shown in Fig. 1, to a wholly outwardly pivoted position which is approximately apparent from Fig. 2. The force which realises the above-mentioned counter-directed pivoting of the arms, the outward pivoting of them, is generated by spring means 21, as will be described in greater detail below.

[0028] Expressed generally, the second or upper anchorage is expandable laterally in relation to the upright

10 under the action of the spring means 21 in order thereby to be able to engage with the surfaces in the radiator 1 which limit the accommodation space 6.

[0029] Interiorly in the upright 10, there is provided a rail 22 which is shiftable in its longitudinal direction and is movable in the vertical direction of the upright 10. The upper end of the rail 22 is in engagement with the mutually facing surfaces of the two arms 17 and 18, whereby an upwardly directed movement of the rail 22 causes pivoting of the arms away from one another, while a downwardly directed movement of the rail permits the arms to be pivoted in towards one another, i.e. in a direction from the position illustrated in Fig. 2 to the position illustrated in Fig. 1, or further.

[0030] It was mentioned above that the lower anchorage 15 is adjustable. For fixedly locking the lower anchorage, this cooperates with a locking device which includes a screw 23 which extends through the upright 10 and through an elongate aperture 24 in the rail 22. On activation of the locking device, the lower anchorage 15 is locked in the adjusted position at the same time as the rail 22 is blocked in the vertical direction. This implies that, with the rail blocked in the vertical direction, the two arms 17 and 18 cannot be pivoted towards one another since they are in engagement with the upper end of the rail. Consequently, the rail 22 acts as a transmission device which functionally interconnects the upper anchorage 16 with the locking device which includes the screw 23 and which is located easily accessible outside the accommodation space 6 and preferably a slight distance under it.

[0031] As will have been apparent from the foregoing, spring means 21 are provided in the base section 8 in the form of a substantially zig-zag shaped spring which, with one end 25 is supported in the base section 8, and which, with its other end 26, abuts against the lower end of the rail 22 and urges the rail upwards. That the rail is urged upwards entails, by cooperation between the upper end of the rail 22 and the two pivotal arms 17 and 18, that these strive to be pivoted away from one another in a direction towards the locking position of the upper anchorage 16.

[0032] On mounting of radiator 1 on the anchorage arrangement illustrated in Figs. 1 and 2, the radiator is pressed down over the upright 10, the two outwardly spring-biased arms 17 and 18 being urged in towards one another, whereby the rail 22 is pressed downwards and the spring 21 is compressed. When the radiator has subsequently come to the correct position and rests on the lower anchorage 15, both of the arms 17 and 18 are spring-biased away from one another and into abutment against those surfaces in the radiator which limit or define the accommodation space 6. On tightening of the screw 23 included in the locking device, and which serves the purpose of manoeuvring device for the locking function of the second anchorage 16, the two plate parts 11 and 12 in the upright are pressed towards one another by the action of the screw and in such a manner

that they clamp the rail 22 fast between them, the rail being thereby locked in position in relation to the upright. This also entails that the two pivotal arms 17 and 18 are effectively prevented from being pivoted back towards the open position of the anchorage 16. As a result, a positionally fixing contact without play prevails between the two arms 17 and 18 and the radiator.

[0033] Fig. 3 shows, on a larger scale, the first or lower anchorage 15. It will be apparent from Figs. 2 and 3 together that the lower anchorage includes two arms 27 and 28 which are displaceable in relation to one another and whose longitudinal direction is transversely directed in relation to the longitudinal direction of the upright 10. The arms 27 and 28 have elongate apertures through which the screw 23 extends. In the outer ends, the two arms have upwardly open recesses 29 and 30 which are intended for accommodating the lower edge portions of the two radiator elements 2 and 3. The two arms 27 and 28 are accommodated in a U-shaped stirrup 31 which, with its rear side, abuts against one of the two plates 11 and 12 of which the upright 10 is composed. On that side of the upright which is opposite to the two arms 27 and 28, as, well as the stirrup 31, there is provided a nut 32 which, on tightening of the screw 23, is urged against the one 11 of the two plates of which the upright 10 is composed. Finally, the lower anchorage 15 also has a lug 34 on each side of the upright for guiding the U-shaped stirrup 31 in the transverse direction of the upright 10.

[0034] In the foregoing, it was mentioned that the lower anchorage 15 is adjustable in the vertical direction, i. e. in the longitudinal direction of the upright 10. This is achieved in that the upright 10 has an elongate aperture 33 along which the screw 23 is slidable in the vertical direction of the upright. On tightening of the screw 23, the lower anchorage 15 is therefore positionally fixed in the vertical direction of the upright 10, at the same time as the two arms 27 and 28 are locked in relation to one another in the transverse direction of the upright. As a result, both of the anchorages 15 and 16 share a common locking device.

DESCRIPTION OF ALTERNATIVE EMBODIMENTS

[0035] As an alternative to the spring means 21 provided in the base section 8 of the arrangement according to the present invention, a spring serving the same function may be placed, in principle, anywhere whatever in the construction. By way of example, mention might be made that one or possibly two springs may be provided for directly acting on the two pivotal arms 17 and 18. Furthermore, the spring may be designed as an elongate, helical spring which, with its one end, abuts against the rail 22 and with its other end abuts against the upright 10.

Claims

1. An arrangement for mounting a radiator (1) with at least two radiator elements (2, 3) on a substrate (7), the radiator (1) having a downwardly open accommodation space (6) extending in its vertical direction, the arrangement comprising:

a base section (8) fixable in the substrate (7);

an upright (10) extending upwards from the base section (8) and disposed to extend up into the accommodation space (6);

a first anchorage (15) supported by the upright (10) and designed for cooperation with a first portion of the radiator (1);

a second anchorage (16) which is accommodated in the accommodation space (6) for cooperation with a second portion of the radiator (1), the second portion being located above the first portion, and the second anchorage (16) having an open position and a locking position for positionally fixing cooperation with the radiator (1);

spring means (21) for pre-tensioning the second anchorage (16) in a direction towards its locking position.

a locking device for locking the second anchorage in the locking position, the locking device being functionally interconnected with the second anchorage (16) by the intermediary of a transmission device (22), and having an operating member (23) located outside the accommodation space (6),

characterized in that said spring means (21) is operative to actuate the second anchorage (16) by the intermediary of the transmission device (22).

2. The arrangement as claimed in Claim 1, **characterized in that** the first anchorage (15) is adjustable in response to the dimensions of the radiator (1) and has a locking device for fixedly locking the first anchorage (15) in a chosen position of adjustment.
3. The arrangement as claimed in Claim 2, **characterized in that** the locking device is common to the first (15) and the second (16) anchorage.
4. The arrangement as claimed in any of Claims 1 to 3, **characterized in that** the transmission device includes an elongate rail (22) which is slidable in its longitudinal direction in the vertical direction in relation to the upright (10).

5. The arrangement as claimed in Claim 4, **characterized in that** the locking device includes a screw (23) which extends through the upright (10) and the rail (22) and which, on tightening, is disposed to clamp the rail (22) fast between wall portions (11,12) included in the upright (10). 5
6. The arrangement as claimed in any of Claims 1 to 5, **characterized in that** the second anchorage (16) includes arms (17,18) pivotally secured in the upright (10) said arms being outwardly pivotal in opposite directions from the upright (10). 10
7. The arrangement as claimed in any of Claims 1 to 6, **characterized in that** said spring means (21) comprises a substantially zig-zag shaped spring (21) which, with its one end (25), is supported in the base section (8) and which, with its other end (26) extends upwards for cooperation with the transmission device (22). 15

Patentansprüche

1. Eine Vorrichtung zur Befestigung eines Heizkörpers (1) mit wenigstens 2 Heizkörperelementen (2,3) an einer Oberfläche, wobei der Heizkörper (1) einen nach unten geöffneten Aufnahmeraum (6) aufweist, der sich in vertikaler Richtung erstreckt, wobei die Vorrichtung aufweist: 25
- einen Basisabschnitt (8), der in der Oberfläche (7) fixierbar ist;
- einen Ständer (10), der sich vom Basisabschnitt (8) nach oben erstreckt und derart gestaltet ist, dass er sich bis in den Aufnahmeraum (6) erstreckt; 30
- einen ersten Anker (15), der durch den Ständer (10) gestützt wird und gestaltet ist, um mit einem ersten Teil des Heizkörpers (1) zusammen zu wirken; 40
- einen zweiten Anker (16), der in dem Aufnahmeraum (6) angeordnet ist, um mit einem zweiten Teil des Heizkörpers (1) zusammenzuwirken, wobei der zweite Teil oberhalb des ersten Teils angeordnet ist und der zweite Anker (16) eine Öffnungsstellung und eine Verschlussstellung hat, um mit dem Heizkörper (1) zusammen zu wirken und ihn auf einer Position zu fixieren; 45
- Federmittel (21), um den zweiten Anker (16) in Richtung seiner Verschlussstellung vorzuspannen; 50
- eine Verschlussvorrichtung zum Verriegeln des 55

zweiten Ankers in der Verschlussstellung, wobei die Verschlussvorrichtung mit dem zweiten Anker (1) funktionell mittels einer dazwischen liegenden Übertragungsvorrichtung (22) verbunden ist, und ein Betätigungsteil (23) aufweist, das außerhalb des Aufnahmeraums (6) angeordnet ist

dadurch gekennzeichnet, dass die Federmittel (21) den zweiten Anker (16) mittels der Übertragungsvorrichtung (22) im Betrieb beaufschlagen.

2. Die Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** der erste Anker (15) in Abhängigkeit von den Abmessungen des Heizkörpers (1) anpassbar ist und eine Verschlussvorrichtung aufweist, um den ersten Anker (15) in einer gewählten, angepassten Position fest zu verriegeln.

3. Die Vorrichtung nach Anspruch 2, **dadurch gekennzeichnet, dass** die Verschlussvorrichtung dem ersten (15) und zweiten (16) Anker gemeinsam ist. 20

4. Die Vorrichtung nach einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet, dass** die Übertragungsvorrichtung eine längliche Schiene (22) aufweist, die in ihrer Längsrichtung, in Bezug auf den Ständer (10), in vertikaler Richtung verschiebbar ist. 30

5. Die Vorrichtung nach Anspruch 4, **dadurch gekennzeichnet, dass** die Verschlussvorrichtung eine Schraube (23) beinhaltet, die sich durch den Ständer (10) und die Schiene (22) erstreckt, und die bei Festziehen derart angeordnet ist, dass sie die Schiene (22) zwischen Wandteilen festklemmt, die im Ständer (10) beinhaltet sind. 35

6. Die Vorrichtung nach einem der Ansprüche 1 bis 5, **dadurch gekennzeichnet, dass** der zweite Anker (16) Arme (17, 18) beinhaltet, die schwenkbar im Ständer (10) befestigt sind, wobei die Arme in entgegen gesetzten Richtungen vom Ständer (10) weggerichtet nach außen schwenkbar sind. 40

7. Die Vorrichtung nach einem der Ansprüche 1 bis 6, **dadurch gekennzeichnet, dass** die Federmittel (21) eine im wesentlichen Zick-Zack geformte Feder (21) aufweisen, die mit ihrem einen Ende (25) im Basisabschnitt (8) festgelegt ist und die sich mit ihrem anderen Ende (26) nach oben erstreckt, um mit der Übertragungsvorrichtung (22) zusammen zu wirken. 45

Revendications

1. Dispositif de fixation d'un radiateur (1) avec au moins deux éléments de radiateur (2, 3) sur un substrat (7), le radiateur (1) ayant un espace de réception ouvert vers le bas (6) s'étendant dans sa direction verticale, le dispositif comprenant :
 - une section de base (8) qui peut être fixée dans le substrat (7) ;
 - un montant (10) s'étendant vers le haut à partir de la section de base (8) et disposé de manière à s'étendre dans l'espace de réception (6) ;
 - un premier ancrage (15) supporté par le montant (10) et conçu pour coopération avec une première partie du radiateur (1) ;
 - un deuxième ancrage (16) qui est logé dans l'espace de réception (6) pour coopération avec une deuxième partie du radiateur (1), la deuxième partie étant située au-dessus de la première partie, et le deuxième ancrage (16) ayant une position ouverte et une position de blocage pour coopération de fixation en position avec le radiateur (1) ;
 - un moyen à ressort (21) pour créer une tension préalable sur le deuxième ancrage (18) dans une direction vers sa position de blocage ;
 - un moyen de blocage pour bloquer le deuxième ancrage dans sa position de blocage, le moyen de blocage étant fonctionnellement interconnecté avec le deuxième ancrage (16) par l'intermédiaire d'un dispositif de transmission (22), et ayant un élément de manoeuvre (23) placé à l'extérieur de l'espace de réception (6) ;

caractérisé en ce que le dit moyen à ressort (21) agit pour actionner le deuxième ancrage (16) par l'intermédiaire du dispositif de transmission (22).
2. Dispositif selon la revendication 1, **caractérisé en ce que** le premier ancrage (15) est réglable en réponse aux dimensions du radiateur (1) et comprend un dispositif de blocage pour bloquer de façon fixe le premier ancrage (15) dans une position de réglage choisie.
3. Dispositif selon la revendication 2, **caractérisé en ce que** le dispositif de blocage est commun au premier (15) et au deuxième (16) ancrages.
4. Dispositif selon une quelconque des revendications 1 à 3, **caractérisé en ce que** le dispositif de transmission comprend un rail allongé (22) qui peut coulisser dans sa direction longitudinale dans la direction verticale par rapport au montant (10).
5. Dispositif selon la revendication 4, **caractérisé en ce que** le dispositif de blocage comprend une vis

(23) qui traverse le montant (10) et le rail (22) et qui est disposée, lors du serrage, de manière à pincer le rail (22) et à le fixer entre des portions de paroi (11, 12) incluses dans le montant (10).

6. Dispositif selon une quelconque des revendications 1 à 5, **caractérisé en ce que** le deuxième ancrage (16) comprend des bras (17, 18) fixés de façon pivotante dans le montant (10), les dits bras pouvant pivoter vers l'extérieur dans des directions opposées par rapport au montant (10).
7. Dispositif selon une quelconque des revendications 1 à 6, **caractérisé en ce que** le dit moyen à ressort (21) comprend un ressort sensiblement en zigzag (21) qui est supporté, à sa première extrémité (25), dans la section de base (8), et qui s'étend, à son autre extrémité (26), vers le haut pour coopération avec le dispositif de transmission (22).





