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(54) **Pivotable antenna bracket**

Drehbare Halterung für eine Antenne

Support d'antenne pivotant

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Description

Field of invention

[0001] The present invention relates to antenna devices, more particularly antenna brackets and most particularly antenna brackets for television antennas for use at/on vehicles such as caravans.

Background

[0002] Television antennas for use with caravans are known in the art. Such antennas can be of the dipole type having directional elements. Such an antenna is directed towards the transmitter by means of a rotateable antenna mast, which can be rotated manually from inside the caravan by means of a roof entrance in the roof of the caravan. The roof entrance also allows the mast to be shifted upwards to obtain better reception as well as downwards to obtain reduced influence of the wind and reduced risk of damage during ride, particularly when passing below bridges and viaducts with reduced free passage height.

[0003] During reception of analogue TV-signals these antennas have worked satisfactorily. After the introduction of digital transmissions the inventors have by practical trials been able to show that lattice antennas, also called vertical net antennas, are to prefer to dipole antennas and omni-directional antennas, when it comes to digital transmissions.

[0004] A drawback with lattice antennas has hitherto been that the they extend principally vertically, which has exposed them to the wind and thereby they have become prone to damage on vehicles, such as caravans.

[0005] The object of the present invention is therefore to provide a device that reduces or totally eliminates the above-mentioned drawbacks with lattice antennas for use with vehicles.

[0006] A further object of the invention is to provide a simple, easy to handle and resource saving device.

Summary of the invention

[0007] The above objects are fulfilled by means of a device according to the present invention.

[0008] By providing an antenna that is easy to fold, the above objects are fulfilled. This is accomplished by providing an antenna device which is provided with a hinge joint between a mast head and an antenna, which allows the antenna to be pivoted between a horizontal position, mainly perpendicularly to the mast and a vertical position, principally parallel to the mast, and which further comprises means to automatically, having its origin in the upward motion of the mast, pivoting the antenna towards the vertical position, when the mast is raised, and means for automatically, having its origin in the mast movement downwards, pivoting the antenna towards to the horizontal position, when the mast is lowered.

[0009] Further, the above mentioned objects are fulfilled by providing a set of fittings, comprising a runner fitting, capable of running along a vertically adjustable mast of the kind often found in caravans. To the runner fittings is attached a stay which in its other end is jointly attached to the antennas main or central beam, in the following called antenna beam. An antenna beam fitting is attached to the antenna beam at a certain distance from the position where the stay is jointly attached to said beam. Further, the antenna beam fitting is jointly attached to a mast head fitting, which is mounted at the top of said mast, forming a hinge joint. By elevating the mast the antenna will be elevated and pivoted from a horizontal to a vertical position. In the vertical position the antenna will work most properly, because the antenna is preferably a lattice type antenna. By lowering the mast the antenna is folded and lowered. With reference to the above reasoning it is most proper to move the caravan, or which ever vehicle, when the antenna is in this horizontal position.

[0010] The function of the stay and the runner fittings is in principle to relay pressure forces in order to pivot the antenna to a horizontal position, when the mast is lowered.

Brief description of the drawings

[0011]

Fig. 1 shows a device according to an embodiment of the invention seen from the side.
Fig. 2 shows in detail an antenna beam fitting from fig. 1 from the side and in cross section.
Fig. 3 shows in detail a mast head fitting from fig. 1 from the side and in cross section.
Fig. 4 shows in detail a runner fitting from fig. 1 from the side and from above.
Fig. 5 shows in detail a stay fitting from fig. 1 from the side and in cross section.

Detailed description of preferred embodiments

[0012] Fig. 1 shows an antenna bracket from the side according to a preferred embodiment of the present invention. An antenna beam fitting 1 is fixedly attached to an antenna beam 8. The antenna beam fitting 1 is close to its first end, by a joint 10, jointly attached to a mast head fitting 2. The mast head fitting 2 is fixedly attached to the top of the mast 4, possibly by means of a mast head adjustment fitting 3.

[0013] Further, a runner fitting 5 is mounted to the mast 4 in such a way that this fitting 5 can run freely along the mast 4, when this is elevated and lowered and rotated. The runner fitting 5 is preferably angularly formed with a hole 43 insignificantly bigger than the diameter of the mast 4.

[0014] At the runner fitting 5 is jointly attached a first end of a stay 6. The other end of the stay 6 is jointly attached to a stay fitting 7, which stay fitting 7 is fixedly

attached to the antenna beam 8. The stay fitting 7 is attached to the antenna beam 8 having a suitable distance to the antenna beam fitting 1 to allow the function below to be accomplished.

[0015] To put the antenna in the receiving position, i.e. a vertical position, the mast 4 is elevated.

[0016] The antenna beam fitting 1 is so mounted to the antenna beam 8 that the centre of gravity 12 of the antenna will be positioned on the stay fitting side of the antenna beam in relation to the joint 10. This position of the centre of gravity 12 entails that, when the mast 4 is elevated, the antenna beam 8 and the associated antenna elements, not shown, will be angularly rotated to a more vertical position, as the mast is elevated. If the mast is further raised after that a vertical position has been taken by the antenna beam 8, the whole antenna will be elevated to a higher position.

[0017] To place the antenna in a transport position, i.e. a horizontal position, the mast 4 is lowered. The runner fitting will then come into contact with the roof entrance 14 (in the roof of the vehicle), which will cause a pressure force in the stay 6 to arise, which is propagated to the antenna beam 8 through the stay fitting 7, which fitting in turn interferes with the antenna beam 8 to pivot around the joint 10 to a gradually more horizontal position. When the antenna beam 8 is horizontal, the design of the antenna beam fitting 1 and the mast head fitting entails that a end position is reached, see further below.

[0018] Fig. 2 shows the antenna beam fitting 1 from the side and in profile. The fitting 1 is preferably devised having with an H-formed profile forming two elongated indentations 21, 22. The upper indentation 21 is intended to house the antenna beam 8. The lower indentation 22 is intended to house the mast head fitting 2, when the antenna is positioned in the folded, i.e. the horizontal position. The advantage having the mast head fitting 2 positioned in the indentation 22 is that the antenna bracket including the antenna gets a stable and safe construction, having large resistance against the speed wind and such, which would otherwise rotate and damage the construction.

[0019] The antenna beam fitting is further provided with a bore 20 for a joint bolt (not shown).

[0020] Fig. 3 shows the mast head fitting 2 from the side and in cross section. The fitting 2 has a rectangular cross section and can be designed within tapering in its end facing away from the joint 36. The fitting 2 is provided with a bore for the joint bolt described above, which also passes through the bores 20.

[0021] Mounting holes 31, 32 are provided to attach to the mast or the mast head adjustment fitting 3.

[0022] Fig. 4 shows the runner fitting 5, which is provided with a hole 43, through which hole the antenna mast 4, preferably of a circular cross section, can run. Further, the runner fitting 5 is provided with a notch 44 at its periphery to articulate towards the stay 6. Holes 41 are provided next to the notch 44 for a joint bolt (not shown).

[0023] Fig. 5 shows the stay fitting 7 from the side and in cross section. The stay fitting 7 is provided with two notches, 51, 52; an upper notch 51 adapted to be attached to the antenna beam 8 by means of a bolt (not shown) through the holes 53 and through the antenna beam 8, and a low notch 52, which is intended to jointly attach the stay fitting 7 to the end close to the antenna beam of the stay 6.

[0024] In another preferred embodiment the antenna bracket is provided with spring means, mounted to divide the antenna beam fitting and the mast head fitting in the initial phase of an unfolding from the horizontal position. Said spring means can for example be a pressure spring, positioned between said fittings or a coil spring, positioned around the joint bolt in the joint 10 with a first spring arm bearing against the antenna beam fitting 1 and a second spring arm bearing against the mast head fitting 2.

[0025] In a further preferred embodiment the running part corresponding to the part 5 has been mounted in a rail (not shown) on the antenna beam, while the fixed part of the stay is mounted at the mast, preferably close to the roof entrance 14.

Claims

1. An antenna device , suitable for a vehicle roof, said device comprising an antenna (8), a mast (4) for said antenna, and a roof entrance (14) for said mast, the device being devised for achieving that the antenna is put in a vertical position when the mast (4) is raised, and in a horizontal position when the mast is lowered, where said device comprises a hinge joint (10) between the antenna (8) and the mast head (3), a runner fitting (5) which is able to run along the mast, and a stay (6) attached to the runner fitting (5) and to the antenna (8) via a stay fitting (7), **characterized in that** an antenna beam fitting (1) comprising the hinge joint (10) is so mounted to the antenna (8) that the centre of gravity (12) of the antenna is positioned on a stay fitting side (7) of the antenna in relation to the hinge joint (10) such that when the mast is raised the antenna is rotated to a vertical position, and when the mast is lowered the runner fitting (5), restricted by the roof entrance, via the stay (6) forces the lower part of the antenna upwards, thereby forcing the antenna to pivot around the hinge joint (10) to a substantially horizontal position.

2. The antenna device of claim 1 also comprising a mast head fitting (2) attached to the head of the mast, where the hinge joint (10) is arranged between the antenna beam and mast head fittings (1, 2) and where the antenna beam fitting (1) has an H-formed cross section, comprising an upper (21) and a lower (22) elongated indentation and in that the mast head fitting (2) is designed with substantially rectangular

profile, where said fittings (1, 2) are adapted such that the lower, elongated indentation of the antenna beam fitting (1) and the mast head fitting fit into each other.

3. The antenna device according to claim 2, where said upper, elongated indentation (21) is so designed that an antenna beam fits therein.

4. The antenna device according to claim 3, further comprising a rail attached to the antenna (8) and where the end, close to the antenna, of the stay (6), runs in said rail.

5. The antenna device according to one of the claims 2-4, further comprising a spring device, arranged to assist a division of the antenna beam fitting (1) and the mast head fitting (2), when the mast is raised.

Patentansprüche

1. Antennenvorrichtung, die für ein Fahrzeugdach geeignet ist, wobei die Vorrichtung eine Antenne (8), einen Mast (4) für die Antenne, und einen Dachzugang (14) für den Mast umfasst, wobei die Vorrichtung vorgesehen ist, um zu erreichen, dass die Antenne in eine vertikale Position, wenn der Mast (4) angehoben wird, und in eine horizontale Position gebracht wird, wenn der Mast abgesenkt wird, wobei die Vorrichtung ein Scharnier (10) zwischen der Antenne (8) und dem Mastkopf (3), eine Laufbefestigung (5), die entlang des Mastes laufen kann, und eine Strebe (6) umfasst, die an der Laufbefestigung (5) und an der Antenne (8) mittels einer Befestigung (7) angebracht ist, **dadurch gekennzeichnet, dass** eine Holmbefestigung (1), die das Scharnier (10) umfasst, so an die Antenne (8) angebracht ist, dass der Schwerpunkt (12) der Antenne an einer Befestigungsseite (7) der Antenne in einer Beziehung zum Scharnier (10) so positioniert ist, dass, wenn der Mast angehoben wird, die Antenne in eine vertikale Position gedreht wird, und wenn der Mast gesenkt wird, die Laufbefestigung (5), die durch den Dachzugang mittels der Strebe (6) begrenzt ist, den unteren Bereich der Antenne nach oben zwingt, wobei die Antenne gezwungen wird, sich um das Scharnier (10) in eine im Wesentlichen horizontale Position zu drehen.

2. Antennenvorrichtung nach Anspruch 1, ferner umfassend eine Mastkopfbefestigung (2), die an dem Kopf des Mastes angebracht ist, wobei das Scharnier (10) zwischen dem Antennenholm und den Mastkopfbefestigungen (1, 2) angeordnet ist, und wobei die Antennenholmbefestigung (1) einen H-gestalteten Querschnitt aufweist, der eine obere (21) und eine untere (22) längliche Vertiefung aufweist, wobei die Mastkopfbefestigung (2) mit einem im Wesentlichen rechteckigen Profil vorgesehen ist, wobei die Befestigungen (1, 2) so angepasst sind, dass die untere längliche Vertiefung der Antennenholmbefestigung (1) und die Mastkopfbefestigung ineinander passen.

3. Antennenvorrichtung nach Anspruch 2, bei welcher die obere, längliche Vertiefung (21) so vorgesehen ist, dass ein Antennenholm darin hinein passt.

4. Antennenvorrichtung nach Anspruch 3, ferner umfassend eine Schiene, die an der Antenne (8) angebracht ist und bei der das der Antenne nahe Ende der Strebe (6) in der Schiene läuft.

5. Antennenvorrichtung nach einem der Ansprüche 2 bis 4, ferner umfassend eine Federvorrichtung, die angeordnet ist, um eine Trennung der Antennenholmbefestigung (1) und der Mastkopfbefestigung (2) zu unterstützen, wenn der Mast angehoben wird.

Revendications

1. Dispositif d'antenne, pouvant convenir à un toit de véhicule, ledit dispositif comprenant une antenne (8), un mât (4) pour ladite antenne, et une entrée de toit (14) pour ledit mât, le dispositif étant conçu pour faire en sorte que l'antenne soit mise dans une position verticale lorsque le mât (4) est relevé, et dans une position horizontale lorsque le mât est abaissé, ledit dispositif comprenant un joint articulé (10) entre l'antenne (8) et la tête de mât (3), une garniture coulissante (5) pouvant se déplacer le long du mât et un étançon (6) relié à la garniture coulissante (5) et à l'antenne (8) par le biais d'une garniture d'étançon (7), **caractérisé en ce qu'**une garniture de faisceau d'antenne (1) comprenant le joint articulé (10) est montée sur l'antenne (8) de manière que le centre de gravité (12) de l'antenne est positionné sur un côté de la garniture d'étançon (7) de l'antenne par rapport au joint d'articulation (10) de sorte que, lorsque le mât est relevé, l'antenne est tournée par rapport à une position verticale et, lorsque le mât est abaissé, la garniture coulissante (5), contrainte par l'entrée de toit, via l'étançon (6) force la partie inférieure de l'antenne vers le haut, forçant ainsi l'antenne à pivoter autour du joint articulé (10) vers une position sensiblement horizontale.

2. Dispositif d'antenne selon la revendication 1, comprenant également une garniture de tête de mât (2) fixée sur la tête du mât, dispositif dans lequel le joint articulé (10) est disposé entre le faisceau d'antenne et les garnitures de tête de mât (1,2) et dans lequel la garniture de faisceau d'antenne (1) présente une section transversale en forme de H, comprenant un

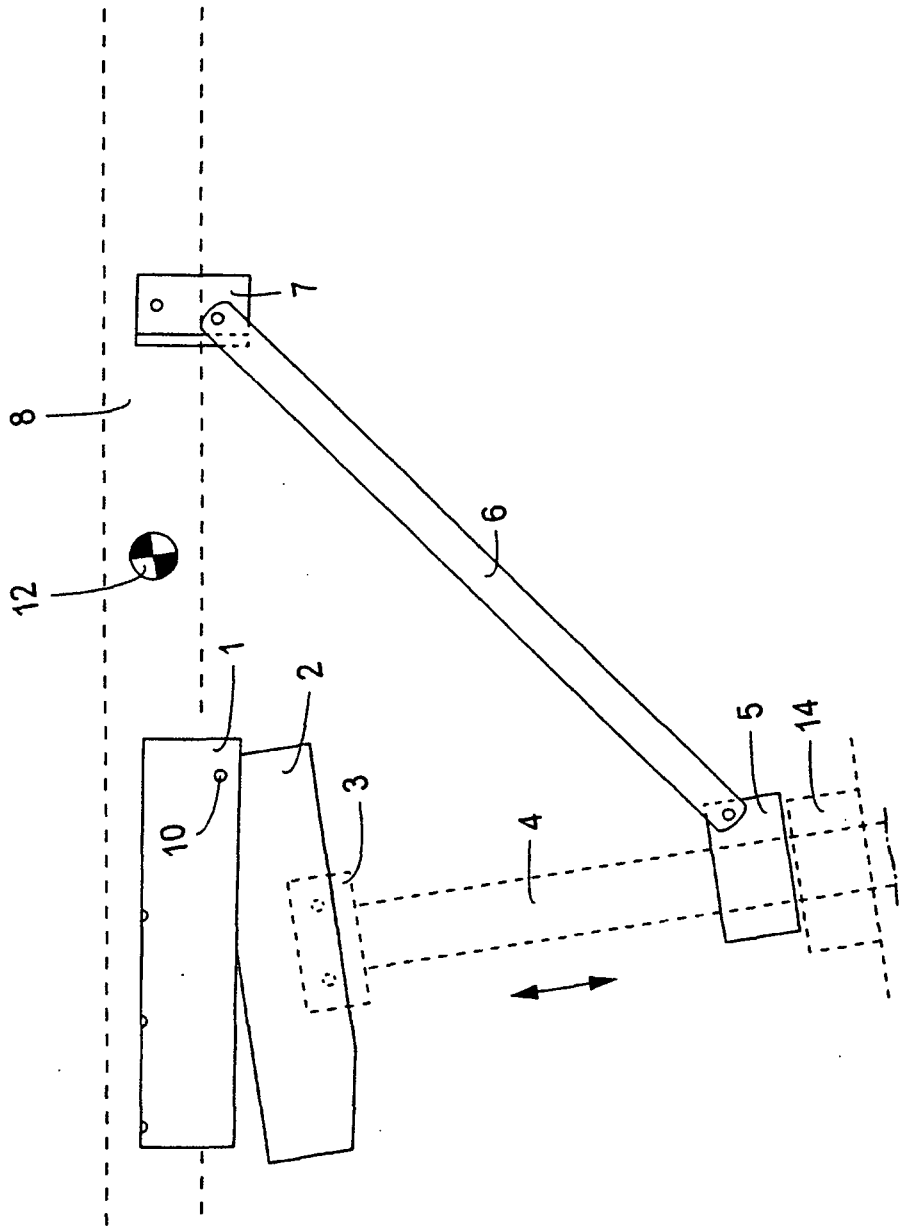
renfoncement allongé supérieur (21) et inférieur (22) et en ce que la garniture de tête de mât (2) est conçue avec un profil sensiblement rectangulaire, dans lequel lesdites garnitures (1,2) sont adaptées de telle sorte que le renfoncement allongé inférieur de la garniture de faisceau d'antenne (1) et la garniture de tête de mât s'emboîtent l'un dans l'autre de façon ajustée.

3. Dispositif d'antenne selon la revendication 2, dans lequel ledit renfoncement allongé supérieur (21) est conçu de telle sorte qu'un faisceau d'antenne peut y être ajusté.

4. Dispositif d'antenne selon la revendication 3, comprenant de plus un rail fixé sur l'antenne (8) et dans lequel l'extrémité, proche de l'antenne, de l'étançon (6) se déplace dans ledit rail.

5. Dispositif d'antenne selon l'une des revendications 2-4, comprenant de plus un dispositif à ressort, disposé pour assister une division de la garniture de faisceau d'antenne (1) et de la garniture de tête de mât (2) lorsque le mât est relevé.

Fig. 1



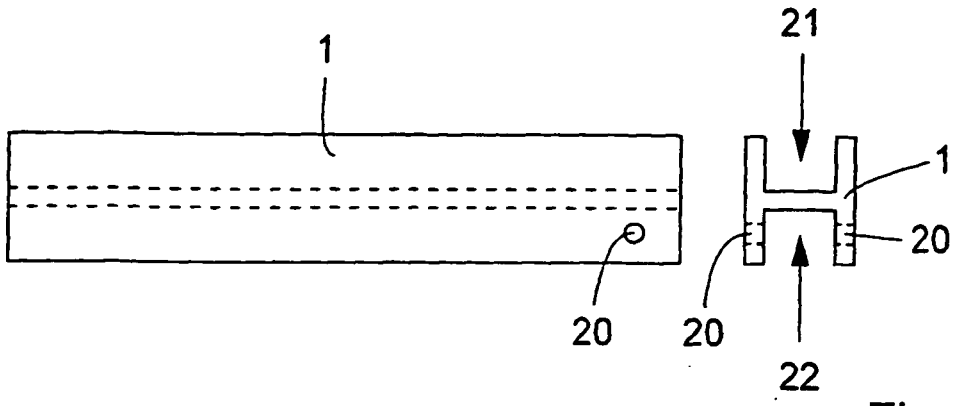


Fig. 2

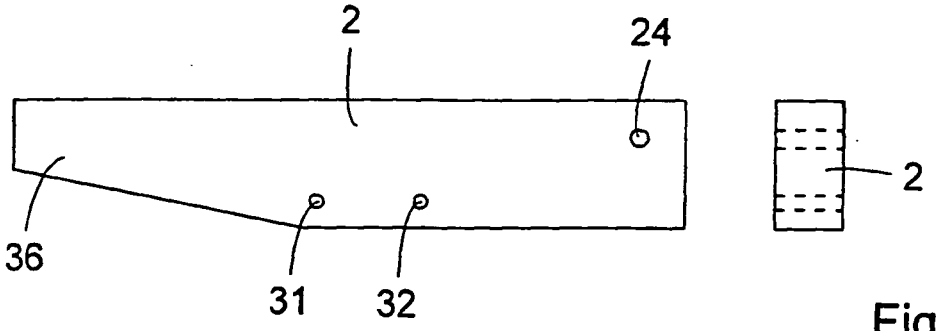


Fig. 3

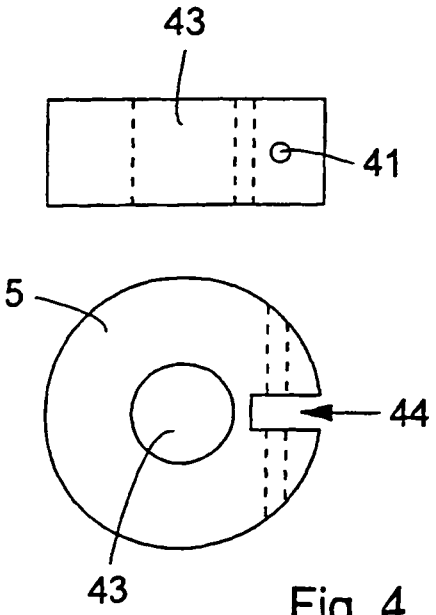


Fig. 4

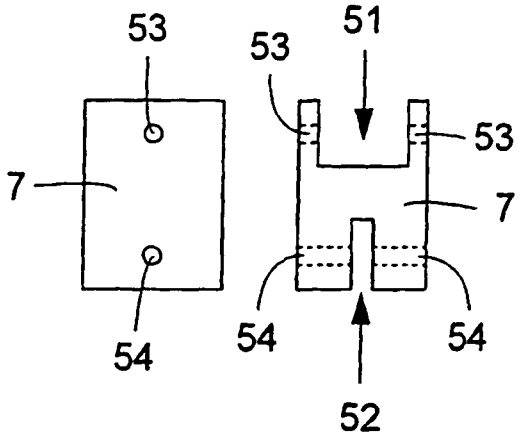


Fig. 5