Abstract: The invention relates to an assembly for retaining optical fibres or other conductors, particularly splices of optical fibres, particularly to be used in a telecommunications network, comprising a base and a holder for one or more optical fibres, wherein the holder is hinged to the base, wherein the holder comprises a passage for passing through the optical fibres in and/or out of the holder, which passage is integrally formed with the holder, wherein the passage extends at least over the length of the hinge connection. In one embodiment the hinge connection has a hinge centre line wherein the passage coincides with the hinge centre line, particularly wherein at least an outer end of the passage is coaxial to the hinge centre line.
Holder for optical fibres or other conductors

BACKGROUND OF THE INVENTION

The invention relates to an assembly for retaining optical fibres or other conductors, particularly to be used in a telecommunications network.

Such holders, also called optical fibre organisers, are used for placing and/or storing fibres therein which fibres have been stripped of their protective sheath of a cable, particularly when two fibres have to be connected one to the other by means of a so-called splice.

For handling a large number of optical fibres, for instance in a distribution box, use can be made of a series of holders that are hinged to a base, as a result of which the holders can be turned individually like the pages of a book, so that the individual holders are accessible for making splices therein between two fibres, or between an introduced fibre and a so-called pigtail. An example of such an assembly is described in European patent application 0.692.102.

In said known assembly the optical fibres are guided to and from the holders underneath the base. In one embodiment use is made of grooves for guiding the fibres, which particularly ensure that the fibres do not make too acute an angle as a result of which they might get damaged.

British patent application 2 312 053 describes a device comprising a base and a number of cassettes for retaining one single splice, wherein the cassettes are hinged to the base. The optical fibres that have been guided into a cassette have been passed through the hinge connection
of the cassette in question. For that purpose the device according to
GB 2 3 1 2 0 5 8 3 is provided with two hollow hinge pins that form a
connection between the base and one of the cassettes, wherein each
hinge pin is able to guide a fibre into the cassette from opposite
directions.

It is an object of the invention to provide at least an alternative device,
preferably a device that is easier to assemble.

It is a further object to provide a device of the type mentioned in the
preamble, wherein optical fibres can be introduced into the cassette
more easily.

It is a further object to provide a device of the type mentioned in the
preamble, with which forces on the unprotected fibres, particularly
tensile and/or pushing forces, can be limited.

SUMMARY OF THE INVENTION

According to one aspect, at least one of these objects is achieved with
the assembly suggested by the invention for retaining optical fibres or
other conductors, comprising a base and a holder for one or more
optical fibres, wherein the holder is hinged to the base, wherein the
holder comprises a passage for passing through the optical fibres in
and/or out of the holder, which passage is integrally formed with the
holder, wherein the passage extends at least over the length of the
hinge connection.

In the assembly according to the invention the passage that is integrally
formed with the holder extends over the hinge connection. As a result
the entrance and/or exit of the passage is situated beyond the hinge
connection and an optical fibre or other conductor can be directly
introduced into the holder via the passage, particularly without the
intervention of further parts such as for instance the hinge pin in GB 2
3 1 2 0 5 3. As a result the fibres or conductor can be placed more easily
in the holder, due to which forces on the unprotected fibres, particularly
tensile and/or pushing forces, can be limited.
In one embodiment the hinge connection has a hinge centre line and the passage, at least partially, coincides with the hinge centre line. In this way the optical fibres can be passed in and/or out of the holder along the hinge centre line.

In one embodiment an outer end of the passage is coaxial to the hinge centre line. As a result the holder will thus hinge around the entrance and/or exit of the holder. When turning the holder the entrance and/or exit remain in their place and only a rotation of the entrance and/or exit opening occurs.

In order to ensure that a bending radius of the optical fibres does not become too small, the passage in one embodiment comprises a cross-section that increases towards the outer end. The increase can be adapted to or exceed a critical bending radius of the optical fibres.

In one embodiment a wall bounding the passage is shaped concave near the outer end. The concave wall may have a radius that exceeds or equals the critical bending radius, as a result of which the outer end is able to guide the optical fibre in a bending radius that exceeds or equals the critical bending radius.

In one embodiment the passage is shaped substantially conical near the outer end. The cross-section then increases substantially equally in all directions. In this embodiment, independent of the position of the holder, the outer end is able to lead the fibre in a bending radius that exceeds the critical bending radius.

In one embodiment the base comprises first hinge members, and the holder comprises second hinge members cooperating with the first hinge members for forming a connection between the holder and the base, which connection is able to hinge. In one embodiment the second hinge members are integrally formed with the holder and said second hinge members comprise the passage.

In one embodiment the holder comprises two hinge members placed near one side of the holder. In one embodiment the two hinge members
are placed near opposite ends of the one side of the holder. In one embodiment said two hinge members each comprise a passage.

In one embodiment the second hinge member comprises a hollow shaft, and the first hinge member comprises an opening for placing the hollow shaft therein.

In one embodiment the first hinge member comprises a snap closure for placing the hollow shaft in the opening, particularly for detachably placing the hollow shaft in the opening. In this way the shaft of the holder can simply be snapped into the opening for placing the holder at the base.

In one embodiment the hollow shaft is rotation fixedly connected to the holder, preferably integrally formed therewith. Such an embodiment can for instance be manufactured from synthetic material by means of an injection moulding process.

In one embodiment a series of holders is hinged to the base, wherein the hinge centre lines of the individual holders are placed substantially parallel to each other and spaced apart from one another, particularly wherein a series of holders is hinged to the base like the pages of a book. The holders preferably can then be turned individually for making the individual holders accessible in order to place for instance a splice therein between an introduced glass fibre cable and a pigtail.

In one embodiment the base comprises detachable covers that can be placed near the hinge connection for covering and protecting the optical fibres passed through the passage.

In one embodiment the base comprises attachment members for placement and attachment of the assembly in a distribution box.

In one embodiment the hinge connection is provided with a through-opening, for instance in the shape of a slot, for introducing an optical fibre from the outside into the passage. Such a through-opening, also called window cut, will make it possible to easily place optical fibres in
the passage, without the optical fibres having to be drawn through the passage from the end of said fibres.

In one embodiment wherein the base comprises first hinge members and the holder comprises second hinge members, wherein the first hinge members comprise a second through-opening, wherein the second through-opening of the first hinge members and the through-opening of the passage comprising second hinge members can be placed in register when the holder is in a certain position with respect to the base.

In one embodiment the wall bounding the passage is provided with a through-opening, for instance in the shape of a slot, for inserting an optical fibre. In a further embodiment the through-opening or slot is placed at an angle to the centre line of the passage. By placing the through-opening or slot at an angle, the optical fibre when being inserted will be place at said angle and be introduced into the passage. The optical fibre, which has been placed in the holder via the passage, will after having been placed sit substantially straight in the passage. Because the through-opening or slot and the optical fibre, that sits straight in the passage, are placed at an angle to each other, the optical fibre cannot move out of the passage to the outside of its own accord, but will be effectively be retained within the passage.

In one embodiment the hinge connection has a hinge centre line, and the passage at least partially coincides with the hinge centre line, wherein the through-opening or slot is placed at an angle to the hinge centre line.

A further embodiment, particularly for an optical cable having at least one optical fibre and at least one flexible reinforcement part, comprises a pull relief device for fixedly clamping the at least one flexible reinforcement part. Such a pull relief device is for instance placed near the base and ensures the fixation of the optical cable so that substantially it does not transfer forces to the unprotected optical fibre that runs along the base, via the passage into the holder.
In one embodiment the pull relief device comprises a tube part, having an introduction side for introducing the optical cable and an exit side for leading out the optical fibre, wherein a wall of the tube part at the exit side comprises a substantially V-shaped cut-out for passing the at least one flexible reinforcement part in axial direction beyond the tube part. Preferably the V-shaped cut-out is provided with lips near the exit side, which lips partially close off the opening for retaining the reinforcement part substantially in the cut-out.

In one embodiment the pull relief device further comprises a confinement device for confining a section of the at least one flexible reinforcement part that has been passed beyond the tube part via the cut-out.

In one embodiment the confinement device comprises a wall part that can be placed substantially against an outer wall of the tube part for confining the section of the reinforcement part that has been placed along the outer wall of the tube part, particularly substantially in a longitudinal direction of the tube part.

In one embodiment the pull relief device comprises an attachment device for attaching the wall part, particularly by forcefully pressing against the outer wall of the tube part.

In one embodiment the wall part is connected to the pull relief device so as to hinge. In this way the wall part, after the reinforcement part has been placed along the outer wall of the tube part, is able to swivel closed and can be attached against the outer wall of the tube part by means of the attachment device.

In one embodiment at least the tube part and the wall part are integrally formed. Such an embodiment can for instance be manufactured from synthetic material by means of an injection moulding process.

In one embodiment the wall part comprises a recess for clamping the section of the reinforcement part placed along the outer wall of the tube part at one or more of the edges of the recess. It has turned out that the reinforcement part can be better fixated when the wall part has
been provided with the recess, than a wall part without recess. Such a recess may comprise a local deepening, but also a through-recess.

In one embodiment the pull relief device comprises a number of adjacently placed tube parts.

In one embodiment the wall part can be placed substantially against adjacent outer walls of the number of tube parts.

In one embodiment the tube part or the tube parts comprise a substantially rectangular, particularly square cross-section.

In one embodiment the pull relief device is connected to the base, or placed in a distribution box together with the base.

According to a further aspect the invention provides an assembly for retaining an optical cable comprising at least one optical fibre and at least one flexible reinforcement part, comprising a pull relief device for fixedly clamping the at least one flexible reinforcement part, wherein the pull relief device comprises a tube part, having an introduction side for introducing the optical cable and an exit side for leading out the optical fibre, and wherein a wall of the tube part at the exit side comprises a substantially V-shaped cut-out for passing the at least one flexible reinforcement part in axial direction beyond the tube part.

In one embodiment the assembly comprises one or more of the measures as described above relating to pull relief devices.

The aspects and measures described in this description and the claims of the application and/or shown in the drawings of this application may where possible also be used individually. Said individual aspects, such as for instance a pull relief device, and other aspects may be the subject of divisional patent applications relating thereto. This particularly applies to the measures and aspect that are described per se in the sub claims.

SHORT DESCRIPTION OF THE DRAWINGS
The invention will be elucidated on the basis of a number of exemplary embodiments shown in the attached drawings, in which:

Figure 1 shows a view in perspective of an exemplary embodiment of an assembly according to the invention;

Figure 2 shows a detail of the hinge connection of the exemplary embodiment of figure 1;

Figure 3 shows a schematic view of an exemplary embodiment of a holder for optical fibres;

Figure 4 shows a schematic view of a detail of figure 3, wherein a through-slot for inserting an optical fibre is arranged in the passage;

Figures 5A and 5B show a view in perspective of an exemplary embodiment of a pull relied device according to the invention;

Figure 6 shows a view in perspective of an example of an assembly of a number of devices of figure 5, and

Figure 7 shows a view in perspective of an example of an assembly of a base having a series of holders for the optical fibres and a number of pull relief devices.

DETAILED DESCRIPTION OF THE DRAWINGS

An exemplary embodiment of a holder 1 according to the invention, as shown in figure 1, is formed like an elongated flat box, wherein the end sides 2, 3 are formed substantially circular. The holder 1 comprises a bottom wall 4 and a circumferential wall 5 placed substantially transverse to the bottom wall 4. At the side facing away from the bottom wall 4, the circumferential wall 5 is provided with lips 6 that extend substantially parallel to bottom wall 4 within the holder 1. The lips 6 are active as stopping means to retain an optical fibre in the holder 1.
The holder 1 may furthermore be provided with further guide walls 7 and/or lips 8 for placing, introducing and retaining a length of optical fibre in a wanted manner.

At one longitudinal side 51, at least at the opposite outer end thereof, the holder 1 is provided with a hollow shaft 9, wherein the circumferential wall 5 comprises an opening 10 that connects to the passage of the hollow shaft 9.

The holder 1 together with a base 11 forms an exemplary embodiment of an assembly according to the invention. The base 11 is provided with a series of support members 12, on which the hollow shafts 9 of the holders 1 may rest. Adjacent to the series of support members 12 a relating series of confinement members 13 is placed, for confining the hollow shafts 9 of the holders 1 that have been placed on the support members 12. In the exemplary embodiment shown in figures 1 and 2 the confinement members 13 form a snap connection for detachably placing the holder 1 on the base 11. The support members 12 and the confinement members 13 form a series of openings in which the hollow shafts 9 of the holders 1 can be placed. The hollow shafts 9 are rotatable in the openings for forming a hinge connection.

As shown in figure 2 the holders 1 can be hinged about their hollow shaft 9. The outer end 91 of the hollow shaft 9 is shaped conical with a wall bounding the passage, which wall is shaped concave. As a result a horn or trumpet-shaped outer end 91 is formed, which guides an optical fibre extending through the passage, in a bend and ensures that a bend radius of the optical fibre does not become too small.

Several fibres can be passed through the hollow shaft 9. In this exemplary embodiment each holder 1 has two hollow shafts 9, wherein two optical fibres can be passed through each hollow shaft 9. As a result two splices, that each connect two optical fibres to each other, can be placed in each holder 1.

The base 11 further comprises a detachable cover 14 for covering, guiding and protecting the optical fibres that are passed from and towards the holders 1.
The assembly as shown in the figures 1 and 2 is particularly suitable for placing and/or storing optical fibres therein which fibres have been stripped from their protective sheath of an optical cable. For that purpose an optical cable is taken, particularly having at least one optical fibre and at least one flexible reinforcement part for instance made of an Aramide fibre, such as Kevlar™ or Twaron™, and a part of the optical fibre is exposed. The unprotected fibre can then be passed via the base 11, particularly underneath the cover 14, via the hollow shaft 9 into the holder 1.

In the embodiment as shown in figure 2, the end of the unprotected optical fibre is introduced via the outer end 91 of the hollow shaft 9 to the holder 1. The unprotected optical fibre is subsequently placed within the holder 1 in a circular path that is bounded by for instance the circumferential walls 5 and/or further guide walls 7, wherein the optical fibre is retained within the holder 1 by the lips 6, 8. Via the second hinging hollow shaft, at the opposite side of the holder 1, a pigtail can subsequently be introduced. Said pigtail can also be placed in the holder 1 and is connected at the wanted location to the end of the optical fibres, via a splice.

In a further embodiment, as shown in figure 3, the hollow shaft 9 is provided with a through-opening in the shape of a slot 92 for placing an optical fibre in the hollow shaft 9. The through slot 92 is shown in more detail in figure 4. The hollow shaft 9 according to this embodiment comprises an outer end 91 that is substantially horn- or trumpet-shaped for guiding the optical fibre in a bend. Said outer end 91 also has a circumferential edge which together with the inwardly situated further circumferential edge 93 forms a boundary for the confinement members 13. As shown in figure 2, the confinement members 13 are spaced apart at a side that faces away from the base 11. In this way it is possible that in a certain turned condition of the holder 1 the through-slot 92 comes to lie atop, such that the through-slot 92 is placed between the ends of the confinement members 13. As a result an optical fibre can be placed in the hollow shaft 9 via the opening between the confinement members 13, the second opening, and the through-slot 92. An advantage of this embodiment is that the
unprotected optical fibre, at least the part that has to be inserted into the holder 1, does not need to be pulled entirely through the hollow shaft 9. The part of the unprotected optical fibre that has to be placed in the hollow shaft 9 can be placed directly from the side into the hollow shaft 9 which considerably simplifies the placement of an optical fibre in the holder 1.

As shown in more detail in figure 4, the through-slot 92 with its centre line 95 is placed at an angle $\alpha$ to the centre line 94 of the hollow shaft 9. After placement an optical fibre will be substantially parallel to the centre line 94. Because the through-slot 92 is placed at an angle $\alpha$, the optical fibre will be effectively confined within the hollow shaft 9.

In addition the holder 1, after the optical fibre has been placed and optionally spliced, will be rotated so that the confinement members 13 will close off the through-slot 92.

In order to counteract the transfer of external forces on the optical cable to the unprotected optical fibre, the end of the optical cable can be placed in a pull relief device. An exemplary embodiment according to the invention is shown in figures 5A and 5B. The exemplary device 30 shown therein comprises four adjacently placed tube parts 31 having a substantially square cross-section. The pull relief device has an introduction side 32 for introducing the optical cable and an exit side 33 for leading the optical fibre out. Each of the tube parts 32 at the exit side 33 is provided with a substantially V-shaped cut-out 34, wherein the cut-outs 34 of the tube parts 32 are situated in one plane.

When exposing the optical fibre of the optical cable, also a part of the flexible reinforcement part is exposed. Said part is placed in the V-shaped cut-out 34 and passed beyond the tube part 32. Near the exit side 33, the V-shaped cut-out 34 is provided with lips 35 that partially close off the opening 36, for retaining the reinforcement part in the cut-out 34.

The exemplary embodiment of the pull relief device 30 is furthermore provided with a wall part 38 that can be placed against the outer wall 37 with the cut-outs 34 of the device 30 for confinement of the
section of the reinforcement part that has been placed along the outer wall 37 of the device 30. At a first side 39 of the outer wall 38 the wall part 38 is connected so as to hinge with the pull relief device 30 having a hinge centre line that runs substantially parallel to the tube parts 31. In the opened condition as shown in figure 5A, the reinforcement parts can be placed along the outer wall 37. At a second side 40 of the device 30 situated opposite the first side 39, attachment means 41 are placed for engaging the edges 42 of the wall section 38. When closing the wall part 38, as shown in figure 5B, the turned edges 42 engage over the outer wall 37 in order to come into engagement with the attachment means 42. The reinforcement parts are then confined between the outer wall 37 and the wall part 38.

The wall part 38 has furthermore been provided with a recess 43 for clamping the sections of the reinforcement parts that have been placed along the outer wall 37 of the device 30 at one or more of the edges 44 of the recess 43. The wall part 38 forms a confinement device for all sections of the reinforcement parts of the optical cables that can be placed in the various tube parts 31. A number, in this example four, optical cables, for instance pigtail cables, can be placed in the individual tube parts 31.

At a side of the device 30 facing away from the outer wall 37, this exemplary embodiment of a pull relief device 30 is furthermore provided with coupling means 45 for coupling the device 30 to a carrier 46 that is adapted for placing a number, in this example four, pull relief devices 30 thereon, as shown in figure 6.

At the introduction side 32 of the pull relief devices 30 the carrier 46 is provided with a guide 47 forming a concave surface, at least at the side where the optical cables are guided to the pull relief devices 30. The guide 47 guides the optical fibres in a bend such that a bending radius of the optical cables does not become too small.

The carrier 46 is provided with coupling means 48 for connecting the carrier 46 with a base 49 that is adapted for placing a number, in this example six, carriers 46 thereon, as shown in figure 7. The case 49 for the carriers 46 is placed near the base 11 for a series of holders 1.
an alternative exemplary embodiment the base 49 for the carriers 46 and the base 11 for a series of holders 1 have been integrally formed.

A composite device as shown in figure 7 can be placed in a distribution box for handling a large number of optical fibres. When necessary further holders 1 and/or carriers 46 can be added thereto.

The above description is included to illustrate the operation of preferred embodiments of the invention and not to limit the scope of the invention. Starting from the above explanation many variations that fall within the spirit and scope of the present invention will be evident to an expert.
Claims

1. Assembly for retaining optical fibres or other conductors, particularly splices of optical fibres, comprising a base and a holder for one or more optical fibres, wherein the holder is hinged to the base, characterised in that the holder comprises a passage for passing through the optical fibres in and/or out of the holder, which passage is integrally formed with the holder, wherein the passage extends at least over the length of the hinge connection.

2. Assembly according to claim 1, wherein the hinge connection has a hinge centre line and wherein the passage coincides with the hinge centre line.

3. Assembly according to claim 1 or 2, wherein at least an outer end of the passage is coaxial to the hinge centre line.

4. Assembly according to claim 3, wherein the passage comprises a cross-section that increases towards the outer end.

5. Assembly according to claim 4, wherein the passage is shaped substantially conical near the outer end.

6. Assembly according to claim 4 or 5, wherein a wall bounding the passage is shaped concave near the outer end.

7. Assembly according to any one of the preceding claims, wherein the base comprises first hinge members, and wherein the holder comprises second hinge members cooperating with the first hinge members for
forming a connection between the holder and the base, which connection is able to hinge.

8. Assembly according to claim 7, wherein the holder comprises two second hinge members placed near one side of the holder.

9. Assembly according to claim 8, wherein the two second hinge members are placed near opposite ends of the one side of the holder.

10. Assembly according to claim 7, 8 or 9, wherein the second hinge member comprises a hollow shaft, and wherein the first hinge member comprises an opening for placing the hollow shaft therein.

11. Assembly according to claim 10, wherein the first hinge member comprises a snap closure for placing the hollow shaft in the opening, particularly for detachably placing the hollow shaft in the opening.

12. Assembly according to claim 10 or 11, wherein the hollow shaft is rotation fixedly connected to the holder, preferably integrally formed therewith.

13. Assembly according to any one of the preceding claims, wherein a series of holders is hinged to the base, wherein the hinge centre lines of the individual holders are placed substantially parallel to each other and spaced apart from one another.

14. Assembly according to any one of the preceding claims, wherein a series of holders is hinged to the base like the pages of a book.

15. Assembly according to claim 13 or 14, wherein the holders can be individually turned for making the individual holders accessible.

16. Assembly according to any one of the preceding claims, wherein the base comprises detachable covers that can be placed near the hinge connection for protecting the optical fibres passed through the passage.
17. Assembly according to any one of the preceding claims, wherein the base comprises attachment members for placement and/or attachment in a distribution box.

18. Assembly according to any one of the preceding claims, wherein the passage comprises a through-opening, preferably extending over the length of the passage for inserting the optical fibres in the passage.

19. Assembly according to claim 18, wherein the through-opening is placed at an angle to the centre line of the passage.

20. Assembly according to claim 18, wherein the hinge connection has a hinge centre line, wherein the passage substantially coincides with the hinge centre line, and wherein the through-opening is placed at an angle to the hinge centre line.

21. Assembly according to claim 18, 19 or 20, when depending on claim 7, wherein the first hinge members comprise a second through-opening, wherein the second through-opening of the first hinge members and the through-opening of the passage can be placed in register when the holder is in a certain position with respect to the base.

22. Assembly according to any one of the claims 18-21, wherein the through-opening and/or the second through-opening comprises a slot.

23. Assembly according to any one of the preceding claims, particularly for an optical cable having at least one optical fibre and at least one flexible reinforcement part, further comprising a pull relief device for fixedly clamping the at least one flexible reinforcement part.

24. Assembly according to claim 23, wherein the pull relief device comprises a tube part, having an introduction side for introducing the optical cable and an exit side for leading out the optical fibre, wherein a wall of the tube part at the exit side comprises a substantially V-shaped cut-out for passing the at least one flexible reinforcement part in axial direction beyond the tube part.
25. Assembly according to claim 23 or 24, wherein the pull relief device further comprises a confinement device for confining a section of the at least one flexible reinforcement part that has been passed beyond the tube part via the cut-out.

26. Assembly according to claim 25, wherein the confinement device comprises a wall part that can be placed substantially against an outer wall of the tube part for confining the section of the reinforcement part that has been placed along the outer wall of the tube part, particularly substantially in a longitudinal direction of the tube part.

27. Assembly according to claim 26, wherein the pull relief device comprises an attachment device for attaching the wall part, particularly wherein the wall part forcefully presses against the outer wall of the tube part.

28. Assembly according to claim 26 or 27, wherein the wall part is connected to the pull relief device so as to hinge.

29. Assembly according to claim 28, wherein at least the tube part and the wall part are integrally formed.

30. Assembly according to claim 26, 27, 28 or 29, wherein the wall part comprises a recess for clamping the section of the reinforcement part placed along the outer wall of the tube part at one or more of the edges of the recess.

31. Assembly according to any one of the claims 24-30, wherein the pull relief device comprises a number of adjacently placed tube parts.

32. Assembly according to claim 32, wherein the wall part can be placed substantially against adjacent outer walls of the number of tube parts.

33. Assembly according to any one of the claims 24-32, wherein the tube part or the tube parts comprise a substantially rectangular, particularly square cross-section.
34. Assembly for retaining an optical cable comprising at least one optical fibre and at least one flexible reinforcement part, comprising a pull relief device for fixedly clamping the at least one flexible reinforcement part, wherein the pull relief device comprises a tube part, having an introduction side for introducing the optical cable and an exit side for leading out the optical fibre, and wherein a wall of the tube part at the exit side comprises a substantially V-shaped cut-out for passing the at least one flexible reinforcement part in axial direction beyond the tube part.

35. Assembly according to claim 34, further comprising one or more of the measures as described per se in claims 25-33.

36. Assembly for retaining optical fibres and/or optical cables provided with one or more of the characterising measures described in the attached description and/or shown in the attached drawings.

37. Method provided with one or more of the characterising measures described in the attached description and/or shown in the attached drawings.