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(72) Inventor: **Romero Magarino, Antonio**
09006 Burgos (ES)

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(74) Representative: **Urteaga Simarro, José Antonio**
31 Principe de Vergara St.
28001 Madrid (ES)

(71) Applicant: **IRAUSA INGENIERIA, S.A.**
E-09007 Burgos (ES)

(54) **Clip-on support shaft for pulley**

(57) A clip-on support shaft for a pulley used in automobile vehicle window winders. The support shaft (10) is a part in the shape of a pan or bowl, provided with a perimetral ledge (23) that controls a wheel (9) arranged on its upper surface. The base of the bowl is occupied

by a set of legs (1,2,3,4) and an auxiliary part (5) in an annex to the support-shaft. These legs become housed on the edges of windows (14,15,16) cut in the profile (II). The base also has a flexible tongue (6) which fits into one wall (12) of the profile (II). The support shaft is fixed to the profile by being clipped directly onto it.

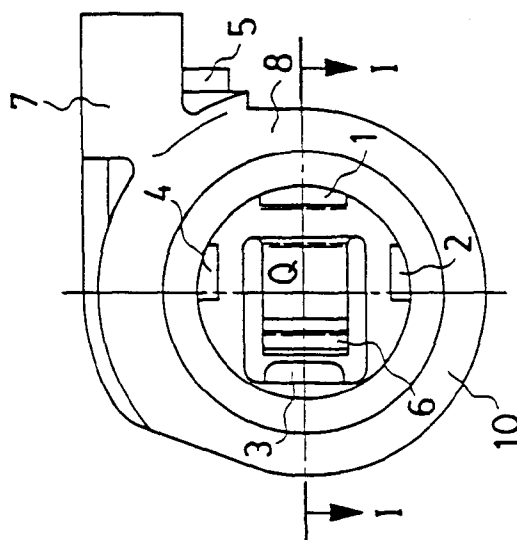


Fig.: 1

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Description

The present invention relates to a clip-on support shaft for rolling band or wheel which can be applied to several techniques, and in particular to the technique used in automobile vehicle window winders, while not excluding other applications, as will be appreciated throughout this description.

It is well known that in the technique used in automobile vehicle window winders, a profile or band is used, along which a window pane drive part travels and is guided. This drive part is in turn connected to a set of cables that pull it according to the turning direction of the winding handle that operates a spool or reel on which the cable is wound.

Some wheels or pulleys stand out from the ends of the profile or band, responsible for guiding the cable towards the said reel and winding handle or electric motor.

These wheels or pulleys, as guide elements, are usually arranged based on a metallic support with a pulley, whose shaft is also metallic, riveted to the support, and a independent plastic guide. This whole assembly means the existence of several parts and the arranging of these parts on the profile or band, in such a way that its manufacture is awkward and expensive. Apart from this, the arranging of the plastic guide also involves certain disadvantages, due to the fact that depending on the output direction, different parts have to be manufactured in order to attend all types of requirements.

As oppose to this traditional technique, the invention provides a support shaft that only needs a simple pulley to adapt itself to the profile or band.

Another object of the invention is the fact that the support shaft is situated onto or removed from the band or profile directly, with a single movement.

Yet another object of the invention is a clip-on support shaft whose geometrical structures are designed so that with two shapes and their symmetrical parts, a solution is provided to the whole range of applications which are required, with a rolling band or pulley which is a single part for any of the said applications.

Another final object of the invention is the fact that in order to use the clip-on shaft, only the assistance of a single band or profile is necessary.

In order to implement these objectives, the invention presents a clip-on support shaft with the shape of a pan or bowl, provided with an outer side surface which is a straight cylinder, with one end open and the other end closed and with a base with a particular shape.

The outer edge of the open end is provided with a circular flange and from the base at least four L-shaped legs jut out, protruding towards the exterior, which are inscribed in the theoretical circular plan view of the said base.

The wings of the said legs remain in a position essentially parallel to the plane of the base, so that hollow spaces are procured between the said wings and the base.

The base of the support shaft is also provided with a horizontal fixing tongue, which is made of and part of the same material as the base and whose free end is interrupted a certain distance from one of the legs.

The ends of the band or profile on which the support shaft has to be received are provided with holes, at least two, which provide a set of edges onto which the legs of the support shaft are accommodated by a clipping action. A horizontal wall is established between the two holes, onto which the tongue of the said support shaft is accommodated, as will be detailed later.

The holes in the profile or band are made, in accordance with any direction whatsoever in relation to the longitudinal direction, for example, of the profile, so that when the support shaft is clipped into place, it can adopt the position that corresponds to the exact operating position of the corresponding installation.

As mentioned previously, the wings on the legs are parallel to the surface of the base plane and, moreover, the space that they procure should be almost equal to the thickness of the band or profile, so that when clipping together is carried out, the grip is secure.

The outer cylindrical area of the support shaft receives a pulley that is clasped by the cable or flexible element in question, with this pulley, during assembly, being controlled between the circular flange and the surface of the band or profile.

Depending on the conductor that promotes the movement of the drive part is used alone or housed in a sheath by way of a Bowden type cable, the support shaft will assume the outer shape of each of these.

When the system uses a conductor directly, the support shaft will assume the simplest expression in its shape and to perform its function, it will use the pulley to which the conductor is adapted.

When the system uses Bowden type cable, the support shaft will be provided with a projection or intake portal or mouthpiece for the flexible conductor, which procures a gap or channel provided on the inside with a set of retaining ridges, so that the said flexible conductor does not become detached during assembly. In the same way, it entails an outer guide casing for the cable or another element driven by the pulley or rolling band.

In the simple case, the first of those mentioned, the support shaft will be provided with the four legs and the tongue already described, and in the second case, the support shaft will also include a fifth leg that stems from the outer area of the guide casing described. This fifth leg protrudes in an equal manner to the other four legs from the base of the bowl-shaped part and is of exactly the same shape.

In order to adjust this latter shaft by clipping it to the profile or band, a third hole or window is made in the band, in which the fifth leg described will be received.

Of the legs from the base of the bowl-shaped part, two are made according to a diametrical line and the other two according to another diametrical line, approximately perpendicular to the former.

The wings of the first two legs are directed in the same direction, with the tongue positioned longitudinally between them, and the other two are in the opposite direction and open towards the exterior.

The two basic windows or holes in the profile or band form edges, of which two are perpendicular to the other two, so that the two, so that the two pairs of legs are received on the two pairs of edges.

Standing out between the two windows is a wall or portion of band. This wall is formed between one edge of one of the windows that receives a leg and another free edge, in such a way that the tongue fits against this free edge as opposed to the leg.

In either of these two variants of the support shaft, the windows or holes, two or three as mentioned, are cut with a joint perforation punching tool. The theoretical centre of these windows indicates the reference point over which the tool should be directed, and this point will coincide with the rotation axis of the clip-on support shaft.

If the support shaft includes the intake mouthpiece for the flexible conductor and the outer guide casing of the cable or other driven element, the detail concerning the centre is particularly interesting, since it allows the mouthpiece to be situated in the direction desired.

All these and other details of the invention can be appreciated in greater detail and exactitude on the sheets of drawings which are attached, where the following, without any kind of limiting nature, are represented:

- Figure 1 is a view of the support shaft in the variant provided with an intake mouthpiece for the flexible conductor.
- Figure 2 is a rear view of Figure 1.
- Figure 3 is a view of Figure 1 seen from the right, showing the band or profile on which the drive part moves.
- Figure 4 is a view of Figure 1 seen from the left, also showing the band or profile.
- Figure 5 represents a top view of Figure 2.
- Figure 6 is the representation of the cross-section I-I carried out in Figure 1, also showing the band or profile.
- Figure 7 is a view of the support shaft in its simplest expression or variant.
- Figure 8 represents the windows or holes cut in the band or profile.

Looking now at Figure 1, we can see the support shaft (10) with its rotation centre (Q), from the base of which it is possible to appreciate the protruding legs (1,2,3,4) as well as the fixing tongue (6) positioned between the legs (1,3). From the body of the shaft (10) itself, it is possible to appreciate the mouthpiece (7) and the leg (5) of this portion. These details are complemented by those shown in Figure 2, in which the rear part of the mouthpiece that procures the gap or hollow (24) and

the inner retaining ridges can be appreciated more clearly, as can the guide casing (26) and the leg (5). The other legs (1,2,3,4) are also visible in their corresponding position in relation to the fixing tongue (6).

5 The shape and arrangement of the legs (1,2,3,4,5) can be observed accurately in Figures 3,4, and 5. The two legs (1,3) from the base have their wings pointing in the same direction and the other two legs (2,4) are also pointing in the same direction, but in the opposite direction to the first two, given that their wings are directed outwards from the said base. For its part, the leg (5) takes the same direction as the leg (4).

10 In these Figures 3 and 4, the intake of the profile or band (11) can be seen perfectly, and how it is taken in by the wings on the legs, as well as the position of the pulley or rolling band (9) situated above the band (11) housed in the support shaft (10).

To understand the part played by the fixing tongue (6), Figures 5 and 6 particularly show its position in relation to the legs, and more specifically to the legs (3,1), with the former (3) of which remaining a certain distance (Fig. 6) away, in such a way that it takes in a portion or wall (12) of the profile or band (11).

15 The outer circular ledge (23) that centres the wheel (11) is also perfectly visible in Figure 6, where we can see the pulley (9) situated on the portion (27) and controlled between the outer circular ledge (23) of the clip-on support shaft (19) and the profile or band (11) itself.

20 As regards the profile or band (11) shown in Figure 7, we can appreciate the two basic holes or windows (14,15) that provide a set of edges (17,18,19,20), as well as a wall (12) between the two holes or windows and an edge or ridge (22).

25 The legs (3,1,4,2) are housed on the edges or ridges (17,18,19,20) respectively, when the support shaft (10) is inserted in accordance with (M) in the profile or band (11) and the end of the fixing tongue (6) is housed on the edge or ridge (22), as illustrated in Figure 6.

A clip-on support shaft (10), as represented in Figure 7, illustrates the simplest solution when the assembly has its function reduced to that of conductor or guide, with the provision of the mouthpiece (7), the leg (5) and the guide casing (26) not being necessary in this case.

30 This support shaft (10) shown in Figure 7 is housed in the holes or windows (14,15) in the profile, with the particularity that the centre (Q) of the joint perforation or hole of these said holes or windows coincides with the centre or axis of the rotation axis of the shaft (10).

35 When the support shaft (10) is configured as represented in Figures 1 and 2, the profile or band (11) receives another auxiliary hole or perforation (16) that provides another edge or ridge (21), on which the leg (5) is received.

40 When the support shaft (10) is housed in the holes or windows, the said shaft is perfectly stabilised, in one direction, by means of the legs (2,4) and in the other direction by means of the legs (1,3) and tongue (6), and, when necessary, by the leg (5).

The holes or window (14,15,16) can be cut in any direction, which means that the joint perforation or hole for clip-fitting the support shaft (10) can be oriented in the direction desired and required for the assembly.

In order to fix the clip-on support shaft (10), both as show in Figures 1 and 2 and as shown in Figure 7, it will be sufficient to simply make it enter or be inserted in the direction (M) illustrated in Figure 8. The legs hold the edges or ridges, and the tongue (6) is fixed against the ledge (22).

In order to dismantle the assembly, it is sufficient to press the tongue (6) downwards and pull the clip-on support shaft (10) in the opposite direction to that of insertion.

The clip-on support shaft is obtained by the injection of a suitable thermoplastic material projected in such a way that it is carried out on moulds with simple opening and closure without displaceable parts, which makes this part a profitable unit as regards tooling production and maintenance.

The thermoplastic materials to be used must be carefully selected in order to coordinate their features with a view to their use, such as stiffness, flexibility and low friction coefficient.

It is important to point out, once having described the nature and advantages of this invention, its non-restrictive character, inasmuch as changes in the shape, materials or dimensions of its constituent parts will not in any way alter its essence, as long as they do not mean a substantial variation of the whole assembly.

Claims

1. Clip-on support shaft for rolling band or wheel, with a wheel or pulley (9) to receive a cable that clasps or entwines the said wheel, which is mounted on a shaft (10), which is connected to a band or profile (11) of constant thickness, which is characterized by:

- a support shaft (10) in the shape of a pan or bowl, with a straight central cylindrical portion (27), on whose open end is situated an outer circular flange (23) and at whose other end or base at least four protruding L-shaped engaging legs (1,2,3,4) are formed, jutting out equally from the surface of the base and elbow-shaped to form wings, with a fixing tongue (6) also being arranged on this base with its end extending towards one of the legs and being interrupted a short distance (12) from it,
- at least two holes or windows (14,15), cut in the band or profile (11), that procure edges or ridges (17,18,19,20) onto which the legs (1,2,3,4) become fitted by the clipping on of the support shaft (10), as well as an area (12) between two holes or windows, into which the fixing tongue

(6) is connected, in that these windows are oriented in any direction so as to allow the positioning of the support shaft in the direction required, with the centre (Q) of the perforation or hole for the windows coinciding with the rotation axis of the support shaft (10),

- a pulley (9) received on the cylindrical outer portion of the shaft.

2. Clip-on support shaft for rolling band or wheel, in accordance with claim 1, characterized in that the support shaft (10) is linked with an outer casing (11) by way of a guide for the cable or other element driven by the pulley (9), with this casing having an intake mouthpiece (7) for the said flexible conductor, with an inner hollow or channel (24) provided with internal retaining ridges (25), in that a leg (5) begins from the exterior of the mouthpiece, similar to those on the base of the shaft and protruding out the same distance as them, with the wing or elbow part of this leg (5) being directed in the same direction as two of the legs (1,3) from the base, carried out according to a horizontal diametrical axis, whereas the other two legs (2,4) from the base are carried out in a vertical direction, and very close to the vertical diametrical axis of the said base, with its wings or elbow parts directed outwards, with the particularity that in the holes or windows in the profile or band (11), the two legs oriented in the same direction as the leg from the mouthpiece are situated clasping longitudinal edges (17,18) formed by the windows (14,15) and the other two outwardly directed legs clasp the transverse edges (19, 20) of one of the windows (15), at the same time that the leg from the mouthpiece is housed on the longitudinal edge (21) of one of an auxiliary windows, (5) also cut in the profile or band, with the two windows that house the legs being separated, in accordance with the horizontal axis, by a wall (12) into which the fixing tongue fits (6).

3. Clip-on support shaft for rolling band or wheel, in accordance with claims 1 and 2, characterized in that when the shaft (10) is reduced to the function of conducting and guiding, the assembly is provided only with the two windows (14,15) for inserting the legs (1,2,3,4) from the base of the bowl-shaped part and the shaft (10) holds the four legs (1,2,3,4) from the base.

4. Clip-on support shaft for rolling band or wheel, in accordance with claims 1,2 and 3, characterized in that the support shaft (10) is housed in the profile or band (11) in such a way that the legs (1,3) in accordance with the horizontal axis and where applicable the leg (5) from the mouthpiece, are housed perpendicularly on the edges (17,18), and edge (21) of the windows or holes in the profile, with the

flexible tongue (6) being housed against the wall (12) between the windows (14, 15), in that to extract the support shaft, the tongue is flexed and the assembly is pulled outwards in the opposite direction.

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5. Clip-on support shaft for rolling band or wheel, in accordance with claims 1, 2 and 3, characterized in that geometrical structure of the support shaft is conceived so that with two symmetrical shapes, with or without the casing and mouthpiece, a solution is provided to the entire range of applications of these devices.

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6. Clip-on support shaft for rolling band or wheel, in accordance with claim 1, characterized in that the shaft (10) and the wheel (9) are made of thermoplastic material, and the shaft is obtained in multiple cavity mould without displaceable parts or other mechanisms.

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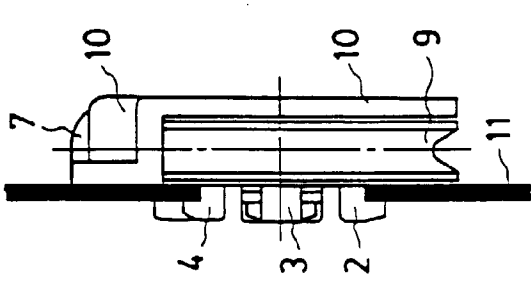


Fig.: 1

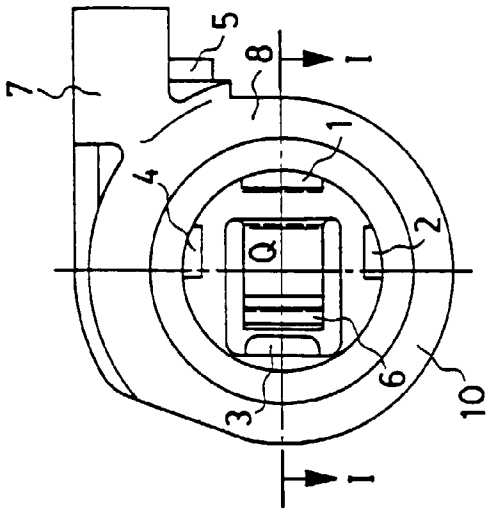


Fig.: 2

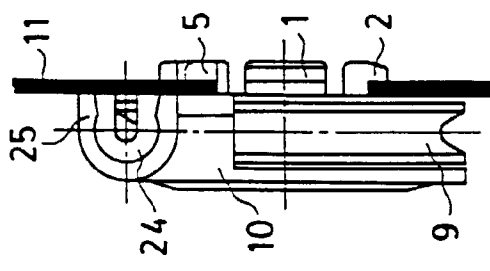


Fig.: 3

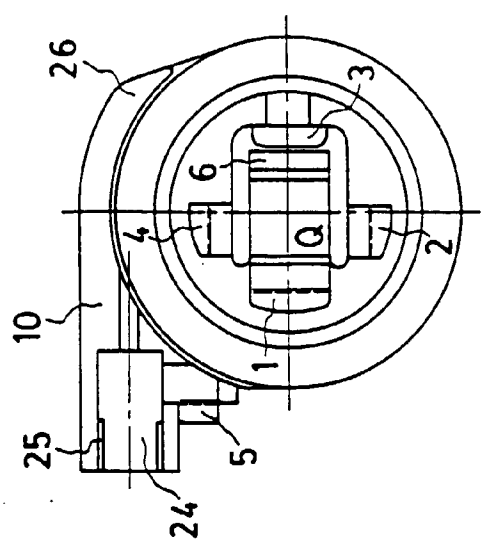


Fig.: 4

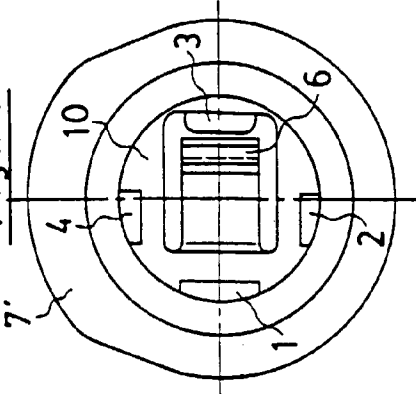


Fig.: 5

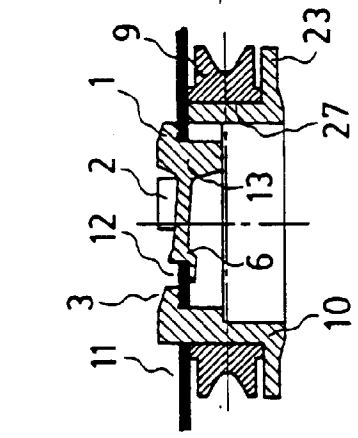


Fig.: 6

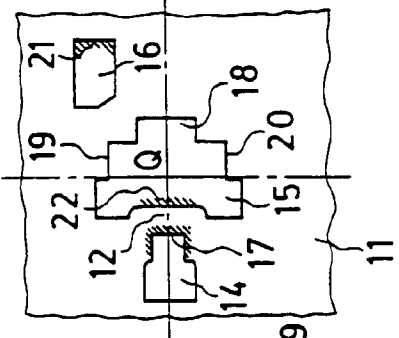


Fig.: 7

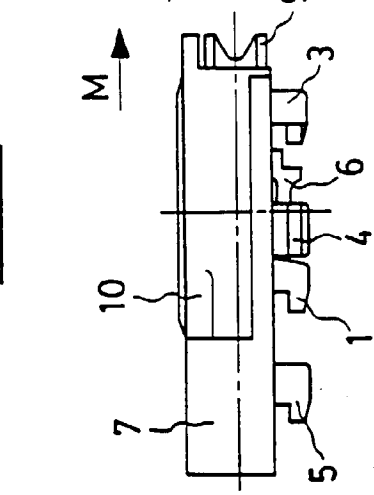


Fig.: 8



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EUROPEAN SEARCH REPORT

Application Number
EP 96 50 0064

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	EP-A-0 385 167 (BROSE) * column 5, line 18 - column 7, line 33; figures * -----	1	E05F11/48
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			E05F
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 13 August 1996	Examiner Van Kessel, J
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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