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(19)

(54) A WINDSCREEN WIPER PARTICULARLY FOR MOTOR VEHICLE WINDSCREENS

(71) We, DUCELLIER & CIE, a French Body Corporate located at Echat 950, 94024 Creteil Cedex, France, do hereby declare the invention for which we pray that a Patent may be granted to us and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a windscreen wiper for motor vehicles including a resilient wiper blade and at least one main arm supporting pivotable yokes which are adapted to hook on to the wiper blade, the main arm being adapted for connection to the free end of a driving lever bent back on itself to form a hook.

In windscreen wipers of this type two different arrangements of the bent back hooked end of the driving lever are to be found. If they both have parallel arms, they differ in the arrangement of a locking means formed on the free branch of the hook.

In one type the locking means is constituted by a slot which co-operates with a lug formed on the coupling device while in the other type, it is constituted by the end of the free branch, partly bifurcated longitudinally by an open groove and bent towards the exterior in the form of a tongue in order to present a bearing face which engages behind a combined shoulder formed on the coupling device.

These two different arrangements are described and shown respectively in the two French Patents Nos. 7021128 and 7325200 in the name of the present applicant.

An object of the present invention is to standardize the coupling device in such a manner that the same type of windscreen wiper can be mounted as desired on either of the two different types of driving lever.

According to the invention, a vehicle windscreen wiper comprises a resilient wiper blade, at least one main arm supporting pivotable yokes which are adapted to hook on to the wiper blade, a coupling device adapted to connect said main arm in manually releasable manner to a hook-shaped bent back free end of a driving lever, the coupling device being composed of a yoke of plastics material having two resilient arms which are slightly divergent, the yoke partially surrounding a fixed shaft on said main arm to form a pivotable connection therewith and being housed within the hook-shaped bent back free end of the driving lever, one of the arms of the yoke including a first locking means adapted for coupling with a driving lever of the type having a locking slot in which the locking means is adapted to engage during the coupling operation and a second locking means, of the resilient snap-engaging kind, adapted for coupling to a driving lever of the type of which the end of the free branch of the hook is partially bifurcated longitudinally by an open slot and is bent back in the form of a tongue in order to present a bearing face.

Two embodiments of the invention will now be described, by way of example, with reference to the accompanying drawings in which:—

Figure 1 is a longitudinal view of one form of vehicle windscreen wiper;

Figures 2 and 3 are respectively side and end views of a coupling device for use in the wiper of Figure 1;

Figure 4 and 5 are views in longitudinal cross-section of stages in the connection of a driving lever to the wiper of Figures 1 to 3;

Figures 6 and 7 are views similar to Figures 4 and 5 showing an alternative form of driving lever for driving the wiper;

Figure 8 is a side view of a modified form of coupling device for use in the wiper of the invention, and

Figures 9 and 10 are views in longitudinal cross-section of the wiper of the invention incorporating the modified element of Figure 8, respectively before and after assembly of the wiper with a driving lever of the type having a locking tongue.

The motor vehicle windscreen wiper represented in Figure 1 includes, in known manner, a wiper blade 1 of resilient material of the rubber type, reinforced by a metal backing strip 2 embedded in its spine portion.

On to the strip 2 are hooked claws 3 of two yokes 4 and 5 of which one 4 is articulated on the other 5 itself articulated on a main arm 6 forming with the balance arms 4 and 5 a pressure distribution harness arrangement.

In order to ensure the connection of the windscreen wiper with a driving lever of which the end is bent back in the form of a hook 7, a coupling device 8 is provided and adapted to form a coupling either with a lever 7 of the type in which the free branch of the hook

includes a locking slot 9, or alternatively with a lever of the type in which the end of the free branch of the hook 7 is bent back in the form of a tongue 10.

The coupling device 8 is introduced into an opening 6*a* formed in the back of a U-shaped medial portion of the main arm 6, between lateral walls 6*b* of the main arm with respect to which it is fixed in a manner such as to be capable of oscillating.

In the embodiment shown in Figures 2 and 3, the coupling device 8 is constituted by a yoke 11 of plastics material having two resilient arms 12 and 13 which are slightly divergent and define a housing 14 which, in use, partially, surrounds a pivot shaft 15 fixed to the main arm 6 of the windscreen wiper and on which the yoke 11 is resiliently fixed and pivots. The yoke 11 has an outer profile such that it is resiliently housed within the hooked bent back end of the driving lever and carries on the external face of its arm 13 a locking lug 16 adapted for the coupling of a driving lever of the type having a locking slot 9 in which the lug 16 engages during the coupling operation (Figures 4 and 5).

The yoke 11 includes a second locking means adapted for coupling to a driving lever of the type of which the end of the free branch of the hook 7, partially split longitudinally by an open slot 17, is outwardly bent in the form of a tongue 10. This second locking means is composed of two parallel cheeks 18 and 19 integral with the yoke 11 and extending outwardly from the lateral edges of the end of the arm 13 thereof. On the internal faces of the cheeks 18 and 19 are formed protrusions 20 and 21 disposed in a manner such that they resiliently move aside upon the passage of the tongue 10 of the driving lever during insertion of the lever 7 onto the coupling device 8. Once the tongue 10 has passed the protrusions, they regain their integral positions, in order to constitute abutments on which the tongue 10 bears. The lug 16 of the first locking means is hidden within the slot 17 (Figures 6 and 7).

The modified coupling device shown in Figure 8, and in use in Figures 9 and 10, differs essentially from the preceding one in that the second locking means is contituted by a bent back portion 22 which extends the arm 13A of the yoke 11A to form a yoke of generally S-shaped profile. The free end of the portion 22 includes a protrusion 23 adapted to move aside, during the coupling operation, upon passage of the tongue 10 of the driving lever which is introduced within the bent back portion 23. The protrusion 23 regains its initial position after introduction in order to constitute a locking abutment for the tongue 10, as shown in Figure 10.

WHAT WE CLAIM IS:–

1. A vehicle windscreen wiper comprising a resilient wiper blade, at least one main arm supporting pivotable yokes which are adapted to hook on the wiper blade, a coupling device adapted to connect said main arm in manually releasable manner to a hook shaped bent back free end of a driving lever, the coupling device being composed of a yoke of plastics material having two resilient arms which are slightly divergent, the yoke partially surrounding a fixed shaft on said main arm to form a pivotable connection therewith and being housed within the hook-shaped bent back free end of the driving lever, one of the arms of the yoke including a first locking means adapted for coupling with a driving lever of the type having a locking slot in which the locking means is adapted to engage during the coupling operation and a second locking means, of the resilient snap-engaging kind, adapted for coupling to a driving lever of the type of which the end of the free branch of the hook is partially bifurcated longitudinally by an open slot and is bent back in the form of a tongue in order to present a bearing face.

2. A windscreen wiper according to Claim 1, wherein the second locking means, which is integral with the yoke, comprises two parallel cheeks on the internal faces of which are formed two protrusions disposed in such a manner that they resiliently move aside upon the passage of the tongue of the driving lever of the second mentioned type during the coupling operation, and regain their initial positions after passage of said tongue in order to constitute locking abutments for the tongue.

3. A windscreen wiper according to Claim 1, wherein the second locking means is constituted by a bent back portion which extends an arm of the yoke to form a yoke of "S" shape, the end of the bent back portion including a protrusion adapted to move aside, during the coupling operation, upon passage of the tongue of the driving lever of the second mentioned type which is introduced into the bent back end of the yoke, and to regain its initial position, after said introduction, in order to constitute a locking abutment for the tongue.

4. A windscreen wiper substantially as hereinbefore described with reference to Figures 1 to 5, Figures 6 and 7 or Figures 8, 9 and 10 of the accompanying drawings.

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2. A windscreen wiper according to Claim 1, wherein the second locking means, which is integral with the yoke, comprises two parallel cheeks on the internal faces of which are formed two protrusions disposed in such a manner that they resiliently move aside upon the passage of the tongue of the driving lever of the second mentioned type during the coupling operation, and regain their initial positions after passage of said tongue in order to constitute locking abutments for the tongue.

3. A windscreen wiper according to Claim 1, wherein the second locking means is constituted by a bent back portion which extends an arm of the yoke to form a yoke of "S" shape, the end of the bent back portion including a protrusion adapted to move aside, during the coupling operation, upon passage of the tongue of the driving lever of the second mentioned type which is introduced into the bent back end of the yoke, and to regain its initial position, after said introduction, in order to constitute a locking abutment for the tongue.

4. A windscreen wiper substantially as hereinbefore described with reference to Figures 1 to 5, Figures 6 and 7 or Figures 8, 9 and 10 of the accompanying drawings.

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