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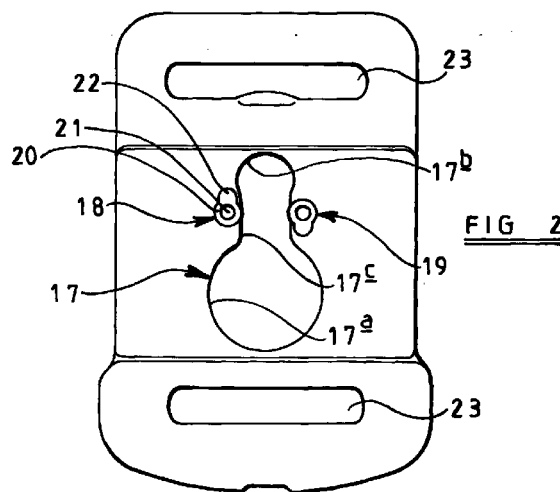
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(54) **Attachment device**

(57) An attachment device for attaching a sling to a hoist, comprises a headed stud 10 and a plate-like clip 12 having a body moulded in plastics material. The body has a slot 17 comprising a first portion 17a through which the head 16 of the stud 10 will pass, a second portion 17b through which the head 16 of the stud 10 will not pass and a third portion 17c joining the first and second portions. The clip also includes two insert moulded elements 18 and 19 on opposite sides, respectively, of the third portion 17c. The insert moulded elements 18 and 19 define a gate in the third portion intermediate the first and second portions. The gate has a width which is slightly less than the cross sectional dimension of the shaft 15 of the stud.



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Description

[0001] This invention relates to an attachment device for attaching a sling to a hoist, particularly but, not necessarily exclusively, an invalid hoist.

[0002] It is known to provide an attachment device comprising a headed stud, which is secured to the lifting arm of a hoist, and a plate-like clip, which is connected to a sling. The clip is provided with a slot comprising a first portion through which the head of the stud will pass, a second portion through which the head of the stud will not pass and a passage joining the first portion to the second portion. In order to place the clip on the stud, the first portion of the slot is aligned with the head of the stud. The clip is then placed over the stud and moved relative to the stud until the shaft of the stud is disposed in the second portion of the slot. The second portion of the slot receives the shaft of the stud with a clearance so that the clip can pivot about the shaft. The passage receives the shaft of the stud as a friction fit to discourage unintentional movement of the clip from an operative position in which the shaft of the stud is disposed in the second slot portion to a disengageable position in which the shaft of the stud is disposed in the first slot portion.

[0003] However, these known clips occasionally unintentionally disengaged from the studs.

[0004] GB 2293857A discloses a clip also provided with a slot having first and second portions similar to those referred to above and a passage joining the first portion to the second portion. The passage over at least part of its length has a width which is less than the cross-sectional dimension of the shaft of the stud and the clip has a weakened zone adjacent to each side of the passage so that the clip can deform to allow the shaft of the stud to pass along the passage between the first and second slot portions. This clip proved unsatisfactory because the manufacturing tolerances were hard to hold and this resulted in clips which were often difficult to disengage.

[0005] The present invention seeks to provide an improved attachment device which overcomes the aforementioned drawbacks.

[0006] According to the present invention, there is provided an attachment device for attaching a sling to a hoist, the attachment device comprising a headed stud and a plate-like clip having a body moulded in plastics material, the body having a slot comprising a first portion through which the head of the stud will pass, a second portion through which the head of the stud will not pass and a third portion joining the first and second portions, the clip including two insert moulded elements on opposite sides, respectively, of the third portion, the insert moulded elements defining a gate in the third portion intermediate the first and second portions, the gate having a width which is slightly less than the cross sectional dimension of the shaft of the stud.

[0007] Preferably, the insert moulded elements are

of more durable plastics material than the material of the body of the clip. The inserts may be of resilient material but are more preferably of non-resilient material and, in the latter case, the inserts, preferably, have a hole extending therethrough from one side to the other side of the clip.

[0008] The invention will now be more particularly described, with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of one embodiment of an attachment device according to the invention; and

Figure 2 is a plan view of the clip shown in Figure 1 on an enlarged scale.

[0009] Referring to the drawings, the attachment device shown therein comprises a stud 10 secured to a lifting arm 11 of an invalid hoist, e.g. a hoist according to GB 2184706B, and a clip 12 connected by a flexible strap 13 to a sling 14.

[0010] The stud 10 has a shaft 15 of circular cross section and a round head 16.

[0011] The clip 12 is plate-like and of generally rectangular shape. It is made of plastics material, typically glass fibre reinforced nylon. The clip 12 has a slot 17 comprising a first part circular end portion 17a, a second part circular end portion 17b spaced from the portion 17a, and a neck portion 17c joining the portions 17a and 17b.

[0012] The diameter of the slot portion 17a, is slightly larger than the diameter of the head 16 of the stud 10. The diameter of the slot portion 17b is less than the diameter of the head 16 of the stud 10 and slightly larger than the diameter of the shaft 15 of the stud 10 so that when the shaft 15 is disposed in the slot portion 17b the clip can pivot freely about the stud 10 but cannot disengage therefrom. The slot portion 17c has a width equal to or slightly greater than the diameter of the shaft 15.

[0013] The clip 12 also includes two insert moulded elements 18 and 19 on opposite sides, respectively, of the neck portion 17c. These insert moulded elements 18 and 19 define a gate in the neck portion 17c intermediate the first and second portions 17a and 17b, respectively. The gate has a width which is slightly less than the diameter of the shaft 15. The insert moulded elements 18 and 19 are of more durable plastics material than the body of the clip and are typically made of an acetyl resin which is a non-resilient material. The inserts 18 and 19 comprise a generally cylindrical body part 20 having a hole 21 extending axially therethrough and an ear 22 projecting from one side of the body 20 in order to prevent the insert moulded elements 18 and 19 from rotating in use.

[0014] It will be appreciated that in order for the shaft 15 to pass from the slot portion 17a to the slot por-

tion 17**b**, the insert moulded elements 18 and 19 must deform outwardly.

[0015] Transverse slots 23 are provided so that the clip can be attached to the strap 13.

[0016] In order to place the clip on the stud, the part circular slot portion 17**a** is aligned with the head 16 of the stud 10. The clip 12 is then placed over the stud 10. A force is then applied to the clip 12 to cause the clip to slide relative to the stud 10 until the shaft 15 of the stud is disposed in the part circular slot portion 17**b**. During the sliding movement, the shaft 15 of the stud 10 outwardly deforms the elements 18 and 19. These elements 18 and 19 must also be outwardly deformed to allow the stud to return to a disengageable position in which the shaft 15 of the stud is disposed in the slot portion 17**a**. The clip is, therefore, unlikely to become unintentionally disengaged from the stud. Also, the clip moves past the gate defined by the elements 18 and 19 with a resounding click. This gives both attendant and user a sense of great security.

[0017] The gate is preferably mid-way or substantially mid-way between the slot portion 17**a** and 17**b**. The shaft 15 of the stud will therefore self locate within the neck portion 17**c** in abutment with the gate. As soon as a load is applied to the clip, the shaft of the stud will move into an engaged position. This will prevent a situation in which the clip fails to be engaged.

[0018] The embodiment described above is given by way of example only and various modifications will be apparent to persons skilled in the art without departing from the scope of the invention. For example, the insert moulded elements 18 and 19 could be of resilient material and, in this case, no hole need be provided therein. Also, the slot portion 17**c** need not be rectilinear. It could be of any other appropriate shape.

3. An attachment device as claimed in claim 1 or claim 2, wherein the inserts (18 and 19) are of resilient material.

4. An attachment device as claimed in claim 1 or claim 2, wherein the inserts (18 and 19) are of non-resilient material.

5. An attachment device as claimed in claim 4, wherein the inserts (18 and 19) have a hole (21) extending therethrough from one side to the other side of the clip.

Claims

1. An attachment device for attaching a sling to a hoist, the attachment device comprising a headed stud (10) and a plate-like clip (12) having a body moulded in plastics material, the body having a slot (17) comprising a first portion (17**a**) through which the head of the stud will pass, a second portion (17**b**) through which the head of the stud will not pass and a third portion (17**c**) joining the first and second portions, the clip including two insert moulded elements (18 and 19) on opposite sides, respectively, of the third portion, the insert moulded elements defining a gate in the third portion intermediate the first and second portions, the gate having a width which is slightly less than the cross sectional dimension of the shaft (15) of the stud.
2. An attachment device as claimed in claim 1, wherein the insert moulded elements (18 and 19) are of more durable plastics than the material of the body of the clip.

