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PATENT SPECIFICATION

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(72) Inventor RAYMOND ANTHONY PAYTON

(19)

(54) A DRAWING COMPASS

(71) We, HELIX INTERNATIONAL LIMITED, a British Company, of Helix Works, Engine Lane, Lye, Stourbridge, West Midlands DY9 7AJ, 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 drawing compasses of that kind (hereinafter called "the kind referred to") wherein the compass comprises a leg having a pointed element at one end and pivoted at its other end to one end of a shank of an arm, said shank having at its other end a laterally-projecting stub or barrel which has an external screw thread thereon and which is formed with a socket hole suitable for receiving a pencil, ball-point pen, or the like.

An object of the invention is to provide a drawing compass which is of a construction such as to enable it to be inexpensively and robustly made as a mass-produced article suitable for use by, for example, school-children.

According to the invention, there is provided a drawing compass, of the kind referred to, having mounted on the projecting stub or barrel an internally scew-threaded clamping ring or nut which is for clamping the pencil, ball-point pen, or the like in place in the stub or barrel and which is held captive on the external screw thread on the stub or barrel by stop means at the inner and outer ends of said external screw thread, and which clamping ring or nut is of plastics material sufficiently resilient to permit the ring or nut, during assembly of the compass, to be moved past the stop means at an end of the external screw thread and sprung into operative engagement with the said external screw thread. In the case of known arrangements of a clamping ring on a stub or barrel of a compass arm, a child may (unless the stub or barrel is upset or otherwise provided with stop means after the ring is in place) without difficulty remove the ring from the stub or barrel and may lose the ring or cross-thread it with the external screw thread in an attempt to replace it. With an arrangement in accordance with the present invention, however there can be achieved the advantageous result that it can be difficult or impossible for a child to remove the ring or nut from the stub or barrel after ring or nut has been sprung into place in manufacture of the compass, and it is not necessary to carry out an upsetting or other stop-forming operation on the stub or barrel after the clamping ring or nut is in place. The inner end of the stub or barrel may be so fashioned, and the clamping ring or nut be sufficiently resilient, to permit the ring or nut, during assembly of the compass, to be passed from the shank of the arm onto the stub or barrel and to be moved past the stop means at the inner end of the external screw thread and thence sprung into operative engagement with said screw thread. The shank of the arm and the stub or barrel may together constitute a one-piece die-cast unit, and the external screw thread and the stop means may be formed during a single die-casting operation. The stub or barrel may have an unthreaded outer portion the inner end of which is adjacent to the outer end of the external screw thread whereby to constitute the stop means at the outer end of said thread for the ring or nut, and the said stub or barrel may have an unthreaded inner portion the outer end of which is adjacent to the inner end of the external screw thread whereby to constitute the stop means at the inner end of said thread for said ring or nut. If desired the arrangement may be such as to permit the clamping ring or nut, during assembly of the compass, to be sprung over the outer end of the stub or barrel whereby to move past the stop means at the outer end of the external screw thread and sprung into operative engagement with said external screw thread.

Also, according to the invention, in a method of producing a drawing compass of the kind referred to, the shank of the arm of the compass is die-cast in one piece with the stub or barrel, and said stub or barrel is formed during the die-casting thereof with the external screw thread and, at the inner and outer ends of said thread, with stop means for holding captive on the thread a clamping ring or nut, and said clamping ring or nut is of resilient plastics material and is, after the arm has been die-cast, moved by a tool past the stop means at an end of the external screw thread and sprung into operative engagement with said external screw thread.

In the accompanying drawings which show, by way of example, a drawing compass constructed in accordance with the invention:

Figure 1 is a front view of a compass;

Figure 2 is a cross-section on the line II—II, Figure 1;

Figure 3 shows an arm, of the compass, shown in Figure 1, having a stub or barrel at its outer end, before a clamping ring or nut is operatively engaged with the stub or barrel;

Figure 4 shows, by way of example, a tool for use in attaching a clamping ring or nut to the screw thread on the stub or barrel shown in Figure 3; and

Figure 5 is a section on the line V—V, Figure 4.

Referring to the drawings, a drawing compass comprises a die-cast metal leg 1 provided with a pointed element 2 at its one end and pivoted at its other or inner end, by means of a pivot screw 3, to one end, shown at 4a, of a shank 4 of a die-cast arm 5, said shank 4 having at its other or outer end an integral laterally-projecting stub or barrel 6 which has an external screw thread 7 thereon and which is formed with a socket hole 8 for receiving a pencil or the like. An internally screw-threaded knurled resilient plastics clamping ring 9 is mounted on the stub or barrel 6 and is operatively engaged with the external screw thread 7, said ring 9 being held captive on the thread 7 and being for clamping the pencil or the like in place in the socket hole 8 in the stub or barrel 6. The stub or barrel 6 has an unthreaded outer portion 10 the inner end 10a of which is immediately adjacent to the outer end of the external screw thread 7 whereby to constitute stop means, at the outer end of the thread 7, for holding the ring 9 captive against removal in an outwards direction from the thread 7; and said stub or barrel 6 has an unthreaded inner portion 11 the outer end 11a of which is immediately adjacent to the inner end of the thread 7 whereby to constitute the stop means, at the inner end of the thread 7, for holding the ring 9 captive against removal in an inwards direction from the thread 7. The overall diameter of said unthreaded inner portion 11 decreases slightly in a direction towards the outer end of the shank 4.

The arm 5, comprising the shank 4 and the stub or barrel 6 with its thread 7 and its unthreaded portions 10, 11 providing stop means 10a, 11a, is formed in one piece in a single die-casting operation. After this arm 5 has been die-cast, the resilient plastics ring 9 is introduced onto the shank 4 over the inner end 4a thereof, before the arm is pivotally connected to the leg 1, and is thence passed from the shank 4 to the stub or barrel 6, being tilted during this latter operation, as indicated in broken lines at 9' in Figure 2, and is, by a suitable tool (for example the tool shown in Figure 4 and 5), pushed over the unthreaded inner portion 11 of the stub or barrel 6 whereby said ring 9 moves past the stop means 11a at the inner end of the external screw thread 7 and springs into operative engagement with said thread 7.

The tool shown in Figures 4 and 5 comprises a metal base 12 provided with a metal block 13 having an upwardly-presented slot 14 (Figure 5) for receiving the shank 4 of the arm 5 of the compass. Said base 12 has a circular locating recess 15 for receiving the outer end of the stub or barrel 6 when the shank 4 is engaged with the slot 14, and has a metal upright 16 provided with a bracket 17 in which is slidable a vertical metal plunger comprising a rod 18 provided at its lower end with a co-axial cylindrical metal sleeve 19 aligned with the recess 15. The plunger 18, 19 is movable up and down by a handle 20 connected to the said plunger via a toggle link 21 pivotally connected at its one end to the handle 20 and at its other end to the plunger. The handle 20 is pivoted at 22 to a bracket 23 carried by the upright 16. A coiled tension spring 24 is connected between the plunger and the bracket 23. In use of the said tool to attach the plastics ring 9 to the screw-thread 7, the ring 9 and arm 5 are positioned beneath the open lower end of the sleeve 19 as shown in Figures 4 and 5, with the stub or barrel in register with the lower end of the sleeve, and the handle 20 is pulled down, against the action of the spring 24, whereby the plunger 18, 19 moves down and the lower end of the sleeve 19 forces the ring 9 into place on the screw thread 7. The handle is then moved back upwards and the arm 5, with the ring 9 now in place, is removed. A slot 25 in the sleeve 19 provides clearance between the sleeve 19 and the shank 4 when the sleeve is pushing the ring 9 into place.

If desired, the ring 9 may, instead of

being passed from the shank 4 to the stub or barrel 6 as described above, be sprung into place from the opposite direction by pushing it, by a suitable tool (which may, for example, be a tool similar to that shown in Figures 4 and 5 but with the tool base and the block thereon modified to hold the arm 5 in a position in which the outer end of the stub or barrel 6 is presented vertically upwards instead of downwards), over the unthreaded outer portion 10 of the stub or barrel whereby said ring 9 moves past the stop means 10a at the outer end of the screw thread 7 and thence springs into operative engagement with said thread 7. The outer end 10 of the stub or barrel 6 may be tapered slightly in an outwards direction to provide a lead for the ring 9 when the latter is being so sprung into place.

The compass shown is of a neat and robust construction which can be inexpensively manufactured by mass production. Removal of the ring 9 from the thread 7 by a child is difficult or impossible, and no upsetting or other operation on the stub or barrel 6 is required after the ring 9 has been sprung into place on the thread 7.

The member 9 may be of any suitable resilient plastics material, for example, acetal.

WHAT WE CLAIM IS:—

1. A drawing compass, of the kind referred to, having mounted on the projecting stub or barrel an internally screw-threaded clamping ring or nut which is for clamping the pencil, ball-point pen, or the like in place in the stub or barrel and which is held captive on the external screw thread on the stub or barrel by stop means at the inner and outer ends of said external screw thread, and which clamping ring or nut is of plastics material sufficiently resilient to permit the ring or nut, during assembly of the compass, to be moved past the stop means at an end of the external screw thread and sprung into operative engagement with the said external screw thread.

2. A drawing compass as claimed in Claim 1, wherein the inner end of the stub or barrel is so fashioned, and the clamping ring or nut is sufficiently resilient, to permit the ring or nut, during assembly of the compass, to be passed from the shank of the arm onto the stub or barrel and to be moved past the stop means at the inner end of the external screw thread and thence sprung into operative engagement with said screw thread.

3. A drawing compass as claimed in Claim 1 or 2, wherein the shank of the arm and the stub or barrel together constitute a one-piece die-cast unit.

4. A drawing compass as claimed in Claim 3, wherein the external screw thread and the stop means at the inner and outer ends of said thread are formed during a single die-casting operation.

5. A drawing compass as claimed in any one of Claims 1 to 4, wherein the stub or barrel has an unthreaded outer portion of the inner end of which is adjacent to the outer end of the external screw thread whereby to constitute the stop means at the outer end of said thread for the ring or nut, and the said stub or barrel has an unthreaded inner portion the outer end of which is adjacent to the inner end of the external screw thread whereby to constitute the stop means at the inner end of said thread for said ring or nut.

6. A drawing compass as claimed in Claim 1, wherein the arrangement is such as to permit the clamping ring or nut, during assembly of the compass, to be sprung over the outer end of the stub or barrel whereby to move past the stop means at the outer end of the external screw thread and spring into operative engagement with said external screw thread.

7. A method of producing a drawing compass of the kind referred to, wherein the shank of the arm of the compass is die-cast in one piece with the stub or barrel, and said stub or barrel is formed during the die-casting thereof with the external screw thread and, at the inner and outer ends of said thread, with stop means for holding captive on the thread a clamping ring or nut, said clamping ring or nut is of resilient plastics material and is, after the arm has been die-cast, moved by a tool past the stop means at an end of the external screw thread and sprung into operative engagement with said external screw thread.

8. A method of producing a drawing compass as claimed in Claim 7, wherein the ring or nut, when being moved to spring into engagement with the external screw thread, is passed from the shank of the arm onto the stub or barrel and is moved past the stop means at the inner end of said external screw thread, the stub or barrel being so fashioned as to permit of such movement.

9. A method of producing a drawing compass as claimed in Claim 7, wherein the ring of nut, when being moved to spring into engagement with the external screw thread, is sprung over the outer end of the

being passed from the shank 4 to the stub or barrel 6 as described above, be sprung into place from the opposite direction by pushing it, by a suitable tool (which may, for example, be a tool similar to that shown in Figures 4 and 5 but with the tool base and the block thereon modified to hold the arm 5 in a position in which the outer end of the stub or barrel 6 is presented vertically upwards instead of downwards), over the unthreaded outer portion 10 of the stub or barrel whereby said ring 9 moves past the stop means 10a at the outer end of the screw thread 7 and thence springs into operative engagement with said thread 7. The outer end 10 of the stub or barrel 6 may be tapered slightly in an outwards direction to provide a lead for the ring 9 when the latter is being so sprung into place.

The compass shown is of a neat and robust construction which can be inexpensively manufactured by mass production. Removal of the ring 9 from the thread 7 by a child is difficult or impossible, and no upsetting or other operation on the stub or barrel 6 is required after the ring 9 has been sprung into place on the thread 7.

The member 9 may be of any suitable resilient plastics material, for example, acetal.

WHAT WE CLAIM IS:—

1. A drawing compass, of the kind referred to, having mounted on the projecting stub or barrel an internally screw-threaded clamping ring or nut which is for clamping the pencil, ball-point pen, or the like in place in the stub or barrel and which is held captive on the external screw thread on the stub or barrel by stop means at the inner and outer ends of said external screw thread, and which clamping ring or nut is of plastics material sufficiently resilient to permit the ring or nut, during assembly of the compass, to be moved past the stop means at an end of the external screw thread and sprung into operative engagement with the said external screw thread.

2. A drawing compass as claimed in Claim 1, wherein the inner end of the stub or barrel is so fashioned, and the clamping ring or nut is sufficiently resilient, to permit the ring or nut, during assembly of the compass, to be passed from the shank of the arm onto the stub or barrel and to be moved past the stop means at the inner end of the external screw thread and thence sprung into operative engagement with said screw thread.

3. A drawing compass as claimed in Claim 1 or 2, wherein the shank of the arm and the stub or barrel together constitute a one-piece die-cast unit.

4. A drawing compass as claimed in Claim 3, wherein the external screw thread and the stop means at the inner and outer ends of said thread are formed during a single die-casting operation.

5. A drawing compass as claimed in any one of Claims 1 to 4, wherein the stub or barrel has an unthreaded outer portion of the inner end of which is adjacent to the outer end of the external screw thread whereby to constitute the stop means at the outer end of said thread for the ring or nut, and the said stub or barrel has an unthreaded inner portion the outer end of which is adjacent to the inner end of the external screw thread whereby to constitute the stop means at the inner end of said thread for said ring or nut.

6. A drawing compass as claimed in Claim 1, wherein the arrangement is such as to permit the clamping ring or nut, during assembly of the compass, to be sprung over the outer end of the stub or barrel whereby to move past the stop means at the outer end of the external screw thread and spring into operative engagement with said external screw thread.

7. A method of producing a drawing compass of the kind referred to, wherein the shank of the arm of the compass is die-cast in one piece with the stub or barrel, and said stub or barrel is formed during the die-casting thereof with the external screw thread and, at the inner and outer ends of said thread, with stop means for holding captive on the thread a clamping ring or nut, said clamping ring or nut is of resilient plastics material and is, after the arm has been die-cast, moved by a tool past the stop means at an end of the external screw thread and sprung into operative engagement with said external screw thread.

8. A method of producing a drawing compass as claimed in Claim 7, wherein the ring or nut, when being moved to spring into engagement with the external screw thread, is passed from the shank of the arm onto the stub or barrel and is moved past the stop means at the inner end of said external screw thread, the stub or barrel being so fashioned as to permit of such movement.

9. A method of producing a drawing compass as claimed in Claim 7, wherein the ring of nut, when being moved to spring into engagement with the external screw thread, is sprung over the outer end of the

stub or barrel whereby to move past the stop means at the outer end of the external screw thread.

10. A drawing compass substantially as herein described with reference to the accompanying drawings.

H. N. & W. S. SKERRETT,
Chartered Patent Agents,
Rutland House,
148 Edmund Street,
Birmingham. B3 2LQ.
Agents for Applicants.

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