PATENT SPECIFICATION

DRAWINGS ATTACHED

1,181,358

1,181,358

Inventor: WILLIAM CHARLES CARLTON.

Date of Application (No. 15931/68) and filing Complete Specification: 3 April, 1968.

Complete Specification Published: 18 February, 1970.

Index at Acceptance:—A6 D25C.

International Classification:—A 63 b 49/12.

COMPLETE SPECIFICATION

Improvements in or relating to Moulded Inserts for Apertures in Metal Racket Frames

We, THE CARLTON TYRE SAVING COMPANY LIMITED of Shire Hill, Saffron Walden, Essex, a British Company 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 moulded inserts for apertures in racket frames for stringing.

It has been proposed in the complete specification of Patent No. 1166078 to provide inserts of moulded plastics material in apertures through racket frames, especially metal racket frames, the apertures being employed for stringing the racket frames. The inserts described in the aforesaid complete specification are in the form of sleeves made of a material which, after assembly of said sleeves in apertures in a frame, will permanently deform under the tension of the strings of the racket. Moreover said sleeves each have an outwardly directed flange at one end and are open at their other end. The sleeves are arranged to be inserted, unflanged end first, in respective apertures through a racket frame from the outside of the frame. The unflanged end of each sleeve is arranged to project slightly beyond the inside of the racket frame and may either be flanged prior to stringing, or the application of stringing to the frame may be arranged to deform the plastics material of said unflanged end.

The insertion of such sleeves in apertures in racket frame is, however, frequently time consuming, especially when the frame is a tubular frame, since the unflanged ends of the sleeves may catch on the edges of the frame surrounding the apertures on the inside of the racket frame. Moreover, the inside of the racket frame with sleeves inserted may be uneven in appearance since it is difficult to ensure that all sleeves project from said inside by the same amount.

Furthermore in manufacturing such sleeves difficulties are experienced in withdrawing them from the mould in which they are made. Such a mould is usually formed with a male part and a female part between which a sleeve is moulded. After moulding, the male part is withdrawn from the female part leaving the sleeve in the female part of the mould. It is then difficult to remove the sleeve from said female part.

According to the invention there is provided a metal racket frame having apertures therethrough for stringing and a moulded insert in an aperture, said insert being tubular and having an outwardly directed flange at one end, characterised in that the unflanged end of said insert is tapered. The invention is developed so that the said insert is tapered and closed.

By providing the insert with a closed and tapered end, insertion through an aperture in a racket frame is facilitated. Preferably the unflanged end of the insert is closed and tapered to a point, although the extremity of the taper may alternatively be radiused.

A moulded insert as described can be inserted, closed end first, into an aperture in a metal racket frame from the outside of the frame, and the insert is arranged to be of such a length that when the flanged end engages on the outside of the frame the closed end projects beyond the inside of the frame. The closed end is subsequently cut off so that an open ended flanged insert remains, the cut off end projecting sufficiently beyond the inside of the frame to enable material of said insert adjacent said cut off end to be deformed by the stringing which is subsequently applied to the racket frame. Preferably the exterior of the insert is provided with a shoulder posi-

[Price 5s. 0d.]

tioned to correspond to the cut off end thereof.

In manufacturing such inserts in a mould having a female part and a male part, the male part can be provided with an annular groove positioned to correspond to the part of the insert which is to be cut off. The effect of this annular groove during withdrawal of the male part is to withdraw the moulded insert with said male part from the female part of the mould. The insert can then be withdrawn from the male part much more readily than from the female part. The annular groove on the male part of the tool causes the wall of the corresponding part of the insert to be thicker than elsewhere. Whilst this would be undesirable if it occurred in the final state of the assembled insert it does not present a problem when occurring in the part of the insert which is cut off.

The material from which the moulded inserts are made is chosen such that it will withstand the tension of the strings without flowing away from them when backed by the material of which the frame is made. Moreover said material is chosen to be strong enough to prevent the tension of the strings from forcing the metal of the racket frame around the insert through the insert. Preferably the material chosen for the inserts should be sufficient to withstand a tension of 70 lbs in the case of tennis rackets and a tension of 24 lbs in the case of badminton rackets. Suitable plastics materials for the inserts are nylon 12 and rigid polyvinylchloride, but the invention is not limited to the use of these particular materials.

In order that the invention may be clearly understood and readily carried into effect it will now be more fully described with reference to the accompanying drawings, in which:—

Figure 1 is a plan view of a plurality of inserts for use in a metal racket frame according to one embodiment of the invention, the inserts all being integral, in a readily removable manner, with a common supporting member,

Figure 2 is a section, on an enlarged scale, through one of the inserts of Figure 1, taken on the line II, and

Figure 3 shows in section, and on the same enlarged scale, an insert in an aperture in a racket frame, the end of the insert on the inside of the frame having been cut off.

Figure 4 shows in section and on the same enlarged scale an insert with a tapered but not closed end.

In the embodiment shown in the drawing a plurality of flanged inserts of plastics material are integrally moulded together as shown in Figure 1. Each insert 1 is of the form shown in Figure 2, having at one end an outwardly directed flange 2 and being closed and tapered at the other end 3. In this embodiment the closed end 3 is tapered to a point, although if desired the extremity of the taper may be radiused. There is a small pullout flange 10 which has resulted from a groove in the male portion of the tool. The exterior of the insert 1 is provided with a shoulder 4 as indicated, near the closed end 3. The purpose of the shoulder 4 will be explained more fully hereinafter.

As shown in Figure 1, in this embodiment, twelve inserts 1 are integrally moulded from a suitable plastics material together with a star shaped supporting member 5 having twelve limbs, one for each insert 1. Each limb 6 is integral, via a thinner portion 7, with the flange 2 of the respective insert 1. By way of example the plastics material of the insert 1 and supporting member 5 may be nylon 12 or rigid polyvinylchloride.

In order to apply the inserts 1 to apertures through a racket frame, an insert 1 is detached from its respective limb 6 by breaking the thinner portion 7 and said insert 1 is then inserted, closed end 3 first, into an aperture through the frame from the closed end 3 first, into an aperture through the frame from the outside of the frame until the flange 2 engages the outside surface of the frame around the respective aperture. The length of the sleeve 1 is arranged to be such that in this position the shoulder 4 projects beyond the inside surface of the racket frame, the closed end 3 projecting even further beyond said inside surface. This is repeated for the other apertures through the racket frame and subsequently the closed ends 3 of the inserts 1 in said apertures are all cut off at the shoulders 4 so that the remaining ends of said inserts 1 project sufficiently beyond the inside of the racket frame to enable material of said inserts adjacent said cut off ends to be deformed by stringing which is subsequently applied to the racket frame.

Figure 3 shows an insert 1 in position in an aperture in a racket frame 8 for stringing, the insert 1 having been cut off at its shoulder 4. In this particular embodiment the racket frame 8 is formed from a metal tube, the apertures through the tube for the stringing having integral flanges 9 projecting towards the interior of the tube from the inside and the outside of the racket frame. By way of example the racket frame 8 may be as described in the complete specification of Patent No. 1112028 or 1112029 or 1112030. When stringing is applied to the racket frame 8 the end of the insert 1 remote from the flange 2 after cutting off becomes deformed by said stringing over the respective flange 9. Alternatively if desired said end may be flanged, using a suitable tool, after cutting off but before stringing is applied to the frame.

In some racket frames for stringing the

lengths of the inserts 1 may be required to be different for different apertures in the racket fame. This may, for example, be the case when a part of the outside surface of the racket frame is recessed to accomodate stringing between some of the apertures. In this event those apertures which terminate in the recess will be of smaller depth than other apertures which are provided away from the region of the recess, and different lengths of moulded inserts are employed for the different depths of apertures. All inserts are then cut off so as to project by substantially the same amount from the inside of the racket frame.

Figure 4 shows an insert which is tapered but open ended at 11.

WHAT WE CLAIM IS:—

1. A metal racket frame having apertures therethrough for stringing and a moulded insert in an aperture, said insert being tubular and having an outwardly directed flange at one end, characterised in that the unflanged end of said insert is tapered.

2. A metal racket frame as claimed in Claim 1, characterised in that the unflanged end of said insert is closed.

3. A metal racket frame as claimed in Claim 2 characterised in that the closed end of said insert tapers to a point.

4. A metal racket frame as claimed in Claim 1 or 2, characterised in that the extremity of the unflanged end of said insert is radiused.

5. A metal racket frame as claimed in Claim 1, 2, 3 or 4, characterised in that the exterior of said moulded insert is provided with a shoulder near said unflanged end at which shoulder said unflanged end can be cut off after insertion of said insert in an aperture in said metal racket frame.

6. A metal racket frame as claimed in any preceding Claim, characterised in that said insert is made of nylon 12.

7. A metal racket frame as claimed in any of the preceding Claims 1 to 5, characterised in that said insert is made of rigid polyvinylchloride.

8. A metal racket frame as claimed in any preceding claim in which the tapered end of said insert has been cut off after insertion in said aperture so that said cut off end of said insert projects from the inside of the racket frame.

9. A metal racket frame as claimed in Claim 8 in which the frame is formed from a metal tube and said aperture has integral flanges therearound projecting towards the interior of the tube from the inside and the outside of the racket frame.

10. A metal racket frame having apertures therethrough for stringing and a moulded insert in an aperture substantially as described with reference to the accompanying drawings, or modified as herein described.

11. A method of preparing an apertured metal racket frame as claimed in any of the preceding Claims 1 to 7 for stringing comprising inserting said moulded insert, tapered end first, into an aperture in said frame so that said outwardly directed flange engages on the outside of said frame and said tapered end projects beyond the inside of said frame, and subsequently removing said tapered end.

12. A method as claimed in Claim 11 substantially as herein described.

13. A racket having a metal frame for stringing as claimed in any of the preceding Claims 1 to 10 or when prepared by a method as claimed in Claim 11 or 12.

SHIRLEY M. HARDING
Agent for the Applicants.

Printed for Her Majesty's Stationery Office by The Tweeddale Press Ltd., Berwick-upon-Tweed, 1970
Published at the Patent Office, 25 Southampton Buildings, London, W.C.2, from which copies may be obtained.

lengths of the inserts 1 may be required to be different for different apertures in the racket fame. This may, for example, be the case when a part of the outside surface of the racket frame is recessed to accomodate stringing between some of the apertures. In this event those apertures which terminate in the recess will be of smaller depth than other apertures which are provided away from the region of the recess, and different lengths of moulded inserts are employed for the different depths of apertures. All inserts are then cut off so as to project by substantially the same amount from the inside of the racket frame.

Figure 4 shows an insert which is tapered but open ended at 11.

WHAT WE CLAIM IS:—

1. A metal racket frame having apertures therethrough for stringing and a moulded insert in an aperture, said insert being tubular and having an outwardly directed flange at one end, characterised in that the unflanged end of said insert is tapered.

2. A metal racket frame as claimed in Claim 1, characterised in that the unflanged end of said insert is closed.

3. A metal racket frame as claimed in Claim 2 characterised in that the closed end of said insert tapers to a point.

4. A metal racket frame as claimed in Claim 1 or 2, characterised in that the extremity of the unflanged end of said insert is radiused.

5. A metal racket frame as claimed in Claim 1, 2, 3 or 4, characterised in that the exterior of said moulded insert is provided with a shoulder near said unflanged end at which shoulder said unflanged end can be cut off after insertion of said insert in an aperture in said metal racket frame.

6. A metal racket frame as claimed in any preceding Claim, characterised in that said insert is made of nylon 12.

7. A metal racket frame as claimed in any of the preceding Claims 1 to 5, characterised in that said insert is made of rigid polyvinylchloride.

8. A metal racket frame as claimed in any preceding claim in which the tapered end of said insert has been cut off after insertion in said aperture so that said cut off end of said insert projects from the inside of the racket frame.

9. A metal racket frame as claimed in Claim 8 in which the frame is formed from a metal tube and said aperture has integral flanges therearound projecting towards the interior of the tube from the inside and the outside of the racket frame.

10. A metal racket frame having apertures therethrough for stringing and a moulded insert in an aperture substantially as described with reference to the accompanying drawings, or modified as herein described.

11. A method of preparing an apertured metal racket frame as claimed in any of the preceding Claims 1 to 7 for stringing comprising inserting said moulded insert, tapered end first, into an aperture in said frame so that said outwardly directed flange engages on the outside of said frame and said tapered end projects beyond the inside of said frame, and subsequently removing said tapered end.

12. A method as claimed in Claim 11 substantially as herein described.

13. A racket having a metal frame for stringing as claimed in any of the preceding Claims 1 to 10 or when prepared by a method as claimed in Claim 11 or 12.

SHIRLEY M. HARDING
Agent for the Applicants.

Printed for Her Majesty's Stationery Office by The Tweeddale Press Ltd., Berwick-upon-Tweed, 1970
Published at the Patent Office, 25 Southampton Buildings, London, W.C.2, from which copies may be obtained.

