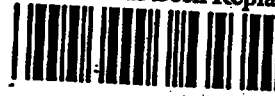


PATENTS ACT 1977
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DESCRIPTION OF INVENTION

"IMPROVEMENTS IN OR RELATING TO AN ELONGATE SUPPORT"

THE PRESENT INVENTION relates to an elongate support.

Elongate supports are used to support tents, marquees, and camouflage nets. Present supports of this type are made of steel, aluminium, bamboo, wood, plastic and the like. Some of these supports, such as supports of bamboo or wood, may have a substantially axially extending fibre structure. Such supports may buckle under an extreme load.

The present invention seeks to provide an elongate support which is lightweight and which is easy to handle.

According to one aspect of this invention there is provided a support comprising the ground engaging base, at least one pole, and a top fork, the ground engaging base being adapted to be connected to the lower end of a or the pole to support a or the pole, and the fork being adapted to be connected to the upper end of a or the pole, the fork presenting a plurality of upwardly directed elements at spaced apart positions.

Preferably the support comprises a plurality of said poles, the poles being adapted to be interconnected.

Conveniently the or each pole is formed of a fibre reinforced plastic material.

Preferably the or each pole is formed of a carbon fibre reinforced plastic material.

Advantageously the or each pole comprises a fibre reinforced plastic material, the fibres comprising carbon fibres together with fibres selected from the group comprising glass, boron and aramid.

Alternatively the or each pole is made of a combination of carbon fibre reinforced plastic material, and plastic reinforced with other fibres selected from the group comprising glass, boron and aramid.

Conveniently wherein the fork is made of a moulded plastics material.

Preferably the fork is made of moulded natural or synthetic rubber or polyurethane.

Advantageously the base is made of a moulded rubber or plastics material.

Conveniently the base is formed of moulded natural or synthetic rubber or polyurethane.

Preferably the or each pole has a weight of between 150 and 200 grams.

Advantageously the base has a weight of between 170 and 200 grams.

Preferably the fork has a weight of approximately 150 grams.

Advantageously the support may be provided in combination with a metal spike to secure the base to the ground.

Preferably the or each pole has a length of between 1 and 1.5 metres.

Conveniently the diameter of the or each pole at one end is less than the diameter at the other end, the said other end of the pole defining a recess adapted to receive frictionally one end of a corresponding pole.

Preferably the means to connect the lower end of the or each pole to the base comprises a recess defined in the base adapted to receive the lower end of the pole as a friction fit.

In one embodiment the recess in the base defines a first portion adapted to receive the lower end of the pole, and a second portion, extending from the first portion, adapted to receive the upper end of the pole.

Advantageously the means to connect the fork to the top of a or the pole comprises a spigot forming part of the fork, the spigot defining a recess adapted to receive the upper end of a pole as a friction fit.

In one embodiment the recess in the spigot defines a first portion adapted to receive the lower end of the pole and a second portion, extending from the first portion, adapted to receive the upper end of the pole.

Preferably the base is substantially identical with the fork.

Conveniently the top fork comprises a plurality of radially outwardly directed arms, each arm terminating with an upwardly directed element.

Preferably the fork comprises a tapering body defining, at one end, a spigot and defining, at the other end, four upstanding regions separated by intersecting grooves or channels.

According to another aspect of this invention there is provided a support comprising a ground engaging base, at least one pole, and a top element, the diameter of the or each pole at one end being less than the diameter at the other end, the base and/or the top element defining a recess having a first portion adapted to receive as a friction fit the said other end of the pole, the recess having a further portion, extending from the first portion, adapted to receive as a friction fit the said one end of the pole.

The invention also relates to a kit of parts for forming a support as described above.

In order that the invention may be more readily understood, and so that further features thereof may be appreciated, the invention will now be described, by way of example, with reference to the accompanying drawings in which:

FIGURE 1 is a perspective of a pole element with parts cut away,

FIGURE 2 is a perspective view of a top fork,

FIGURE 3 is a sectional view of the top fork of Figure 2,

FIGURE 4 is a perspective view of a base,

FIGURE 5 is a sectional view of the base,

FIGURE 6, is a side elevational view of an assembled support with parts cut away,

FIGURE 7 is a perspective view of an alternative top fork,

FIGURE 8 is a sectional view of the alternative top fork of Figure 7,

FIGURE 9 is a sectional view of a modified top fork, mounted on a pole, and

FIGURE 10 is a sectional view of the top fork of Figure 9 used as a base.

A support in accordance with the invention is formed from at least one pole, a top fork and a base. If there are two or more poles they are frictionally interconnected.

Referring to Figure 1 a pole 1 is illustrated. The pole 1 is elongate, having a total length of between 1 and 1.5 metres. The pole 1 is a tapering pole, having an upper narrow end and a lower broader end. The upper end of the pole 2 has a diameter of approximately 22 mm, whereas the lower end 3 of the pole has a larger diameter, typically 25 mm. At least at the lower end 3 of the pole an axially extending bore 4 is provided having a diameter of

approximately 22 mm adapted to receive the upper end 2 of an adjacent pole in a friction fit.

The pole 1 is made of a fibre reinforced plastic material. The fibre used to reinforce the plastic comprises carbon fibre, preferably together with fibres of another material, such as glass, boron, or aramid, which together with the carbon fibres form a hybrid fabric. Preferably the fibres are arranged stochiastically. That is to say that the fibres have a random orientation, with fibres thus extending in all directions. This enhances the strength of the reinforced plastics material, and reduces any tendency to buckle under an extreme load. Alternatively, the pole may be made of a combination of carbon fibre reinforced plastic, and plastic reinforced with other fibrous material, such as glass, boron or aramid.

A pole, as described, may be much lighter than a metal pole of equivalent strength. Typically, a pole as described may have a weight of between 150 and 200 grams.

It is envisaged that the pole may be a tubular pole, with the recess 4 effectively forming one end of a through-bore.

It is to be appreciated that any number of poles 1, as described above, may be interconnected to form the major part of a support element in accordance with the invention, although it is envisaged that a preferred support element in accordance with the invention will comprise between 1 and 10 poles as described.

Referring now to Figures 2 and 3 of the accompanying drawings, a fork 5 adapted to be mounted at

the top of the support comprises a downwardly directed spigot 6, having a downwardly open recess 7 formed therein adapted to receive, as a friction fit, the top end 2 of a pole 1 as described with reference to Figure 1. The upper part of the spigot 6 supports four substantially radially outwardly extending arms 8, each arm being inclined slightly upwardly with reference to the horizontal. Each arm terminates with an upwardly directed projection 9 of rectangular section, presenting a rectangular upper surface.

The fork 5 may be made of any appropriate mouldable plastic material, such as natural or synthetic rubber or polyurethane. It is envisaged that the weight of a fork as illustrated will be approximately 150 grams.

Referring now to Figures 4 and 5 a base 10 is illustrated comprising a circular flange 11 which, when viewed in section in Figure 5, can be seen to be of arcuate form, having a central upwardly extending spigot 12 which defines, at its upper end, a recess 13 dimensioned to receive the lower end of a pole 1 as shown in Figure 1.

The base may be moulded from an appropriate plastic material such as polyurethane or natural or synthetic rubber, and it is envisaged that the base will have a weight of between 170 and 200 grams.

A metal pin 14 may be provided, (shown in phantom) weighing, for example, approximately 50 grams, to be inserted through part of the base to secure the base to the ground.

As can be seen from Figure 6, an assembled support in accordance with the invention comprises a base 10, which

engages the ground, which receives the lower end 3 of a pole 1. Two further poles 1 are provided which are interconnected in a frictional manner as described above, and the upper-most pole 1 supports, at its upper end, a top fork 5.

The entire assembled pole of Figure 6 may, for example, have a height of approximately 3.2 metres, and may have a weight which is less than 1 kilogram.

Figures 7 and 8 illustrate an alternative form of top fork, which again may be moulded from polyurethane or natural or synthetic rubber or any other appropriate mouldable plastics material. The alternative top fork comprises a body 15 having a flat end 16 of circular form, and tapering in a non-uniform manner to a spigot 17 which has, at the end opposed to the flat end 16, a recess 18 adapted to receive the top part 2 of a pole 1.

Two diametrically extending intersecting grooves 19,20 are provided extending across the flat end 16, each groove being of trapezoidal or undercut form. Thus, four separate upwardly directed elements 21,22,23,24 are defined at spaced apart positions, each having a sector-shaped face which partly defines the said flat end 16.

Referring now to Figures 9 and 10, in a modified embodiment of the invention a single design of moulding is used both for the top fork and for the base.

Referring initially to Figure 9 a moulded element 30 is illustrated which is used as a top fork, the element 30 being moulded of natural or synthetic rubber or of polyurethane. The element 30 has a configuration

similar to that of the top fork shown in Figures 7 and 8. Thus the element 30 presents a top face 31 divided into four regions by intersecting channels such as the channel 32. The element presents a depending spigot 33. Formed in the lower terminal end of the spigot is a recess 34. The recess 34 presents an initial part 35 of relatively large diameter. Extending co-axially from the initial part 35 is a second part 36 of narrower diameter. As can be seen from Figure 9, the part 36 of narrower diameter is adapted to receive, as a friction fit, the upper portion 2 of a pole 1.

Turning now to Figure 10, a moulded element 30 is shown in the inverted position acting as a base. Here it can be seen that the initial part 35 of the recess 34 is dimensioned to receive, as a frictional fit, the lower end 3 of the pole 1. It can be seen that the lower end of the pole 3 has a dimension which is larger than the dimension of the second part 36 of the recess 34.

The arrangement illustrated in Figures 9 and 10 does possess various advantages. Clearly, only one type of moulded element 30 is needed to be used either as a base or as a top fork, thus serving to reduce moulding costs. However, with the lower end 3 of a pole 1 received in the first part 35 of the recess 34, because there is no material within the further part 36 of the recess, the spigot 33 possesses a predetermined degree of flexibility. Thus, the pole 1 may be positioned not only to be absolutely vertical, but may, if desired, be positioned to be inclined at a slight angle to the vertical. This may prove to be very desirable in certain circumstances.

It is to be appreciated that whilst in the illustrated embodiments, both the ends of the pole and the

recesses adapted to receive the pole are of substantially circular form, the outer periphery of each pole could be slotted, and corresponding slots or projections could be provided in each recess.

Whilst the invention has been described by way of example, it is to be appreciated that modifications may be effected without departing from the scope of the invention.

CLAIMS:

1. A support comprising the ground engaging base, at least one pole, and a top fork, the ground engaging base being adapted to be connected to the lower end of a or the pole to support a or the pole, and the fork being adapted to be connected to the upper end of a or the pole, the fork presenting a plurality of upwardly directed elements at spaced apart positions.
2. A support according to Claim 1 comprising a plurality of said poles, the poles being adapted to be interconnected.
3. A support according to Claim 2 wherein the or each pole is formed of a fibre reinforced plastic material.
4. A support according to Claim 3 wherein the or each pole is formed of a carbon fibre reinforced plastic material.
5. A support according to Claim 3 wherein the or each pole comprises a fibre reinforced plastic material, the fibres comprising carbon fibres together with fibres selected from the group comprising glass, boron and aramid.
6. A support according to Claim 3 where the or each pole is made of a combination of carbon fibre reinforced plastic material, and plastic reinforced with other fibres selected from the group comprising glass, boron and aramid.



7. A support according to any one of the preceding Claims wherein the fork is made of a moulded plastics material.

8. A support according to Claim 6 wherein the fork is made of moulded natural or synthetic rubber or polyurethane.

9. A support according to any one of the preceding Claims wherein the base is made of a moulded rubber or plastics material.

10. A support according to Claim 9 wherein the base is formed of moulded natural or synthetic rubber or polyurethane.

11. A support according to any one of the preceding Claims wherein the or each pole has a weight of between 150 and 200 grams.

12. A support according to any one of the preceding Claims wherein the base has a weight of between 170 and 200 grams.

13. A support according to any one of the preceding Claims wherein the fork has a weight of approximately 150 grams.

14. A support according to any one of the preceding Claims in combination with a metal spike to secure the base to the ground.

15. A support according to any one of the preceding Claims wherein the or each pole has a length of between 1 and 1.5 metres.



16. A support according to any one of the preceding Claims wherein the diameter of the or each pole at one end is less than the diameter at the other end, the said other end of the pole defining a recess adapted to receive frictionally one end of a corresponding pole.

17. A support according to any one of the preceding Claims wherein the means to connect the lower end of the or each pole to the base comprises a recess defined in the base adapted to receive the lower end of the pole as a friction fit.

18. A support according to Claim 17 wherein the recess in the base defines a first portion adapted to receive the lower end of the pole, and a second portion, extending from the first portion, adapted to receive the upper end of the pole.

19. A support according to any one of the preceding Claims wherein the means to connect the fork to the top of a or the pole comprises a spigot forming part of the fork, the spigot defining a recess adapted to receive the upper end of a pole as a friction fit.

20. A support according to Claim 19 wherein the recess in the spigot defines a first portion adapted to receive the lower end of the pole and a second portion, extending from the first portion, adapted to receive the upper end of the pole.

21. A support according to any one of Claims 17 to 20 wherein the base is substantially identical with the fork.

22. A support according to any one of the preceding Claims wherein the top fork comprises a plurality of



radially outwardly directed arms, each arm terminating with an upwardly directed element.

23. A support according to any one of Claims 1 to wherein the fork comprises a tapering body defining, at one end, a spigot and defining, at the other end, four upstanding regions separated by intersecting grooves or channels.

24. A support comprising a ground engaging base, at least one pole, and a top element, the diameter of the or each pole at one end being less than the diameter at the other end, the base and/or the top element defining a recess having a first portion adapted to receive as a friction fit the said other end of the pole, the recess having a further portion, extending from the first portion, adapted to receive as a friction fit the said one end of the pole.

25. A support substantially as herein described with reference to and as shown in Figures 1 to 6 of the accompanying drawings.

26. A support substantially as herein described with reference to and as shown in Figures 1 to 6 as modified by Figures 7 and 8 of the accompanying drawings.

27. A support substantially as herein described with reference to and as shown in Figures 1 to 6 as modified by Figures 9 and 10 of the accompanying drawings.

28. A kit of parts for forming a support according to any one of the preceding Claims.



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29. Any novel feature or combination of features disclosed herein.

