

MESH BAND

The present invention relates to a mesh band which comprises helical members and pin members. Such a band might be used as a bracelet or a bracelet for a wrist watch.

Helical members are classified as to the direction of wind into left-handed or S-twist helical members 1 as shown in Fig. 1, and right-handed or Z-twist helical members 2 as shown in Fig. 2. A mesh band 3 as shown in Figs. 3, 4 is known which comprises a row of parallel, helical members of the same direction of wind, for example, left-handed helical members 1 fitted into one another, or passing through one another. Another mesh band 6 or 7 as shown in Figs. 5, 6, 7 or in Fig. 8 is also known which is manufactured by causing a row of parallel, alternate helical members of different directions of wind, for example, parallel, alternate left-handed and right-handed helical members 1,2 to engage with one another, and then by inserting a connecting rod across the length of each of the columns of the portions 4 at which such engagements take place, to connect the helical members 1,2 to one another.

In any of these mesh bands 3, 6, 7 fabricated according to the prior art, the cut ends 8 and/or 9 of the helical members 1 and/or 2 appear on both lateral faces of the mesh band, as shown in the schematic perspective views of Fig. 4 and Fig. 6. Therefore any one of the mesh bands 3, 6, 7 has a drawback that, when it is worn about the wrist, the cuff of a sleeve of wearer's apparel catches on the cut ends 8, 9 of the helical members 1, 2. They possess another drawback that it is difficult to expect absolute safety since the cut ends 8, 9 can damage other objects and inflict bodily injury on the wearer and on other persons.

Various attempts have been proposed to eliminate the above-

mentioned drawbacks; for example, either the cut ends 8, 9 are individually brazed or pushed into the inside, or the lateral faces of the mesh band 3, 6 or 7 are hammered or spread out in order to form flat ones. However, these operations require intricate process steps and cost a great deal. Furthermore, the finished goods themselves do not look nice and are of no value as articles of commerce. Especially in the case where helical members are made of a noble metal, in the prior art a process of individually brazing the cut ends requires an extremely large number of man-hours. Another attempt has been proposed in which an unfinished mesh band is folded across two straight lines which pass through their respective points at a perpendicular distance of approximately $1/4$ of the width of the unfinished mesh band from both the edges thereof and which are parallel to the longitudinal center line, in such a way that both the edges are brought to the center line on the wrong side, and then the unfinished mesh band thus folded is sewn at the middle. In this case, the mesh band has a drawback that its thickness will be increased unless a smaller diameter is employed for the wire forming the helical member.

According to the present invention there is provided a mesh band which comprises:

a row of parallel, helical members adjoining one another, each of the helical members having end faces; and

connecting pin members, each of which has a head and at least one pin body, the pin bodies of the connecting pin members being inserted into the end faces of the helical members, the heads of the connecting pin members substantially covering the end faces of the helical members, the helical members being rigidly fixed to the pin bodies thus inserted.

5 The pin bodies of the connecting pin members are generally inserted from the end faces of the helical members thereinto in such a way that the connecting pin members of each said pair are diametrically opposed to each other with relation to the longitudinal centerline of the mesh band. The pin bodies thus inserted connect the helical members to one another as well as impart flexibility to the mesh band. The covering of the cut ends or end faces of the helical members by the heads of the connecting pin members serves to make the whole of the lateral faces of the mesh band smooth.

The invention will be further described by way of example with reference to the accompanying drawings, in which:

Fig. 1 is a front view of a left-handed helical member;

Fig. 2 is a front view of a right-handed helical member;

Fig. 3 is a schematic plan view of a conventional mesh band which comprises a row of parallel, helical members of the same wind direction fitted into one another;

Fig. 4 is a perspective view of the conventional mesh band of Fig. 3;

Fig. 5 is a schematic plan view of a conventional mesh band which has a row of parallel, alternate left-handed and right-handed helical members intermeshing shallowly with one another;

Fig. 6 is a perspective view of the conventional mesh band of Fig. 5;

Fig. 7 is a schematic side view of the conventional mesh band of Fig. 5;

Fig. 8 is a schematic plan view of a conventional mesh band in which three connecting rods are inserted into each helical member;

Fig. 9 is a schematic plan view of an embodiment of the invention, similar to the conventional mesh band of Fig. 3 in the arrangement of helical members;

Fig. 10 is a perspective view of the embodiment of Fig. 9;

Fig. 11 is a schematic plan view of another embodiment of the invention which is similar to the conventional mesh band of

Fig. 5 in the arrangement of helical members;

Fig. 12 is a schematic plan view of a further embodiment of the invention which is similar to the conventional mesh band of Fig. 8 in the arrangement of helical members;

5 Fig. 13 is a schematic plan view of yet another embodiment of the invention;

Fig. 14 shows perspective views of various connecting pin members related.

A mesh band embodying the invention is shown in Fig. 9 and
10 comprises a band-like object or a stripe consisting of a row of parallel, helical members of the same direction of wind, for example, parallel, left-handed helical members 1 fitted into one another and having two end faces 15; and a multiplicity of pairs of connecting pin members 14, each said connecting pin member having two pin
15 bodies 16 and a head 17 integral therewith. The pin bodies 16 of the connecting pin members 14 are inserted from the end faces 15 of the helical members 1 therein into in such a way that the connecting pin members 14 of each said pair are diametrically opposed to each other with relation to the longitudinal centerline of the band-like object.
20 The pin bodies thus inserted 16 connect the helical members 1 to one another. The coils of the helical members 1 are pressed to the inserted pin bodies 16 so as to be rigidly fixed thereto. Fig. 10 is a perspective view of the embodiment of Fig. 9.

The embodiment is roughly the same as a conventional mesh
25 band of Fig. 3 in the arrangement of helical members. Since the parallel, left-handed helical members 1 shown in Fig. 3 are fitted into one another, a band-like object or a strip can in a sort be made out of only the helical members of the same direction of wind without the insertion of connecting rods 5 from the end faces 15

② into the helical members 1. However, a mesh band embodying the invention is manufactured by the steps of: slitting a row of parallel, left-handed helical members 1 of multiple length fitted into one another, into multiple band-like objects or strips of the desired width - the desired length of the helical member or the length of the desired number of coils; inserting the pin bodies 16 of connecting pin members 14 into the helical members 1 with the heads 17 of the connecting pin members 14 pushed against the end faces 15 of the helical members 1; and pressing the coils of the helical members 1 to the inserted pin bodies 16 so as to be rigidly fixed thereto. Therefore the number of pin bodies 16 of a connecting pin member 14 may be one or more. Since the connecting pin members 14 prevent the ravelling of the helical members 1 at the edges of the band-like object and since the heads 17 of the connecting pin members 14 cover the lateral faces of the band-like object to smooth them, the connecting pin members 14 can obviate the longstanding drawback of the cut ends catching other objects.

Another mesh band 11 embodying the invention may be seen in Fig. 11 to comprise: a row of parallel, alternate left-handed and right-handed helical members 1, 2 engaging shallowly with one another to form engagement portions 4 such as those shown in Fig. 7; and a multiplicity of pairs of connecting pin members 14, each said connecting pin member 14 having two pin bodies 16 and a head 17. A pair of diametrically opposed pin bodies 16 are inserted across the length of each of the columns of the engagement portions 4 to connect the helical members 1, 2 to one another. This mesh band is called a herringbone mesh band and is roughly the same as a conventional mesh band of Fig. 5 in the arrangement of helical members; but in the mesh band 11 embodying the invention, each connecting rod 5 of Fig. 5



is replaced by a pair of the diametrically opposed pin bodies 16 which function as a connecting means, and the heads 17 of the connecting pin members 14 cover the cut ends 8, 9 of the left-handed and right-handed helical members 1, 2 situated in the lateral faces 15 of a band-like object or a strip, which fact results in the solution of the longstanding problem of the cut ends catching other objects. The number of the pin bodies 16 of a connecting pin member 14 may be one or two; however, a connecting pin member 14 which has two pin bodies 16 is thought to be more effective in inserting them into the helical member and in manufacturing the connecting pin member. A mesh band more excellent in ornamental design may be provided by imparting an ornamental property to the mesh band 11, for example, by using helical members and connecting pin members, both of which are different from each other in material, or by adding colors to or making patterns on the heads 17 of the connecting pin members 14.

A further mesh band 12 embodying the invention may be seen in Fig. 12 to be what is called a herringbone mesh band of the type in which parallel, alternate left-handed and right-handed helical members 1, 2 intermesh deeply with one another and thereby three pairs of pin bodies 16 are inserted into each of the helical members 1, 2. The number of the pin bodies 16 of a connecting pin member 14 may be one or more, and a combination of a connecting pin member having one pin body and a connecting pin member having plural pin bodies may be used. The mesh band shown in Fig. 12 is roughly the same as the conventional mesh band of Fig. 8 in the arrangement of helical members.

A still further mesh band 13 embodying the invention may be seen in Fig. 13 to comprise: a row of parallel, helical members of the same direction of wind, for example, left-handed helical members intermeshing slightly with one another; and a multiplicity of pairs

of connecting pin members 14, each said connecting pin member 14 having two pin bodies 16 and a head 17. The pin bodies 16 of each said pair of the connecting pin member 14 are inserted into two intermeshing helical members 1 in such a way that the connecting pin members of each said pair are diametrically opposed to each other with relation to the longitudinal centerline of the mesh band. The pin bodies thus inserted 16 connect the helical members 1 to one another. The coils of the helical members 1 are rigidly fixed to the inserted pin bodies 16. A mesh band may likewise be constructed by the use of right-handed helical members 2 instead of the left-handed helical members 1.

Although the invention has been described with respect to a few embodiments thereof, it will be clearly understood by those skilled in the art that the invention is not limited thereto or thereby, but various changes and modifications, or the various combinations and arrangement of parts can be made in the invention without departing from the spirit and scope thereof as defined in the claims. Since a problem of the lateral faces catching other objects in a conventional mesh band arises from the cut ends 8 and/or 9 of helical members 1 and/or 2, mesh bands of higher quality can be supplied to the market by covering the cut ends 8 and/or 9 without impairing the characteristics which such mesh bands should possess. The connecting pin members 14 of the invention eliminate the above-mentioned drawback of catching other objects, irrespective both of the material of which helical members are made and of the shape thereof, and the impartation of ornamentality to the heads 17 of the connecting pin members 14 enables the provision of a mesh band having a novel ornamental design not obtainable from a conventional one.

Fig. 14 shows the connecting pin members 14-a through 14-i embodying the invention. A connecting pin member 14-a has a pin body 16 and is shaped into a thumbtack-like form. The head 17 of the connecting pin member 14-a may previously be formed into the same shape as the lateral face of the helical member in a finished state of a mesh band. Connecting pin members 14-b, 14-c have two and three pin bodies 16 respectively. Like the head 17 of the connecting pin member 14-a, the head 17 of each of the connecting pin members 14-b, 14-c may beforehand be formed into the same shape as the lateral face of the helical member in a finished state of its own mesh band. Each of connecting pin members 14-d through 14-h has a head 17 and two pin bodies 16, both of which are integrally formed with each other out of one and the same stock. A connecting pin member 14-i comprises a head 17 and a pin body 16, both of which are integrally formed with each other out of one and the same stock. The pin body 16 of the connecting pin member 14-i is eccentric with respect to the head 17 thereof. The shape of a head 17 is not limited to those shown in Fig. 14, but any shape and size that can cover the cut end 8 or 9 of a helical member 1 or 2 may be employed. The number of pin bodies 16 may be varied as required. In the case of a mesh band of the type having a row of parallel, helical members of the same direction of wind fitted into one another and connecting pin members, each of the pin bodies thereof not only serves to reinforce the connective strength between two mating helical members, but also provides the places to which the coils thereof are rigidly fixed.

In the mesh band of the invention, the cut ends of helical members in the lateral faces of an in-process mesh band are covered with the heads of connecting pin members, which solves the problem of the lateral faces catching other objects which is a problem in

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a conventional mesh band. Furthermore, either ornamentality such as color, patterns, etc., may be imparted to the heads of helical members, or the respective materials of which a connecting pin member and a helical member are made may be caused to be different from each other
5 in order to create a novel ornamental design, which will result in a mesh band which meets diversified needs.

In the herringbone mesh band of the invention in which left-handed helical members are arranged alternately with right-handed ones, connecting pin members, each of which has at least one pin body and a
10 head integral therewith, are substituted for conventional connecting rods having no head. Therefore the need for attaching heads individually to the connecting rods which have been inserted into the helical members so arranged is eliminated, which fact will assure extremely efficient manufacture of the mesh band.

15 As has been mentioned above, the mesh band of the invention is the epoch-making one in which, no matter how arranged any helical members are, the cut ends thereof are covered with the heads of connecting pin members, and the coils of the helical members are rigidly fixed to the pin bodies of the connecting pin members, which
20 fact permits the mesh band to fulfill its function proper as a mesh band and to remove all the drawbacks of a conventional mesh band.



CLAIMS

1. A mesh band which comprises:
a row or parallel, helical members adjoining one
another, each of the helical members having end
faces; and
5 connecting pin members, each of which has a head
and at least one pin body, the pin bodies of the
connecting pin members being inserted into the
end faces of the helical members, the heads of the
connecting pin members substantially covering the
10 end faces of the helical members, the helical
members being rigidly fixed to the pin bodies thus
inserted.
2. A mesh band according to Claim 1, wherein the
direction of wind of the helical members alternates
15 along the row.
3. A mesh band according to Claim 1, wherein the
helical members have the same direction of wind.
4. A mesh band according to Claim 1; wherein the row
of parallel, helical members adjoining to one
20 another are a row of parallel, helical members of
the same direction of wind fitted into one another.
5. A mesh band according to Claim 1, wherein at least
two helices intermesh and wherein a pin member
comprises two said pin bodies each said pin body
25 extending into a respective one of said two inter-
meshing helices, the said helices being locked

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together by means of said head of said pin member.

6. A mesh band substantially as hereinbefore described with reference to Figs. 9, 10, 11, 12 or 13 of the accompanying drawings.
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