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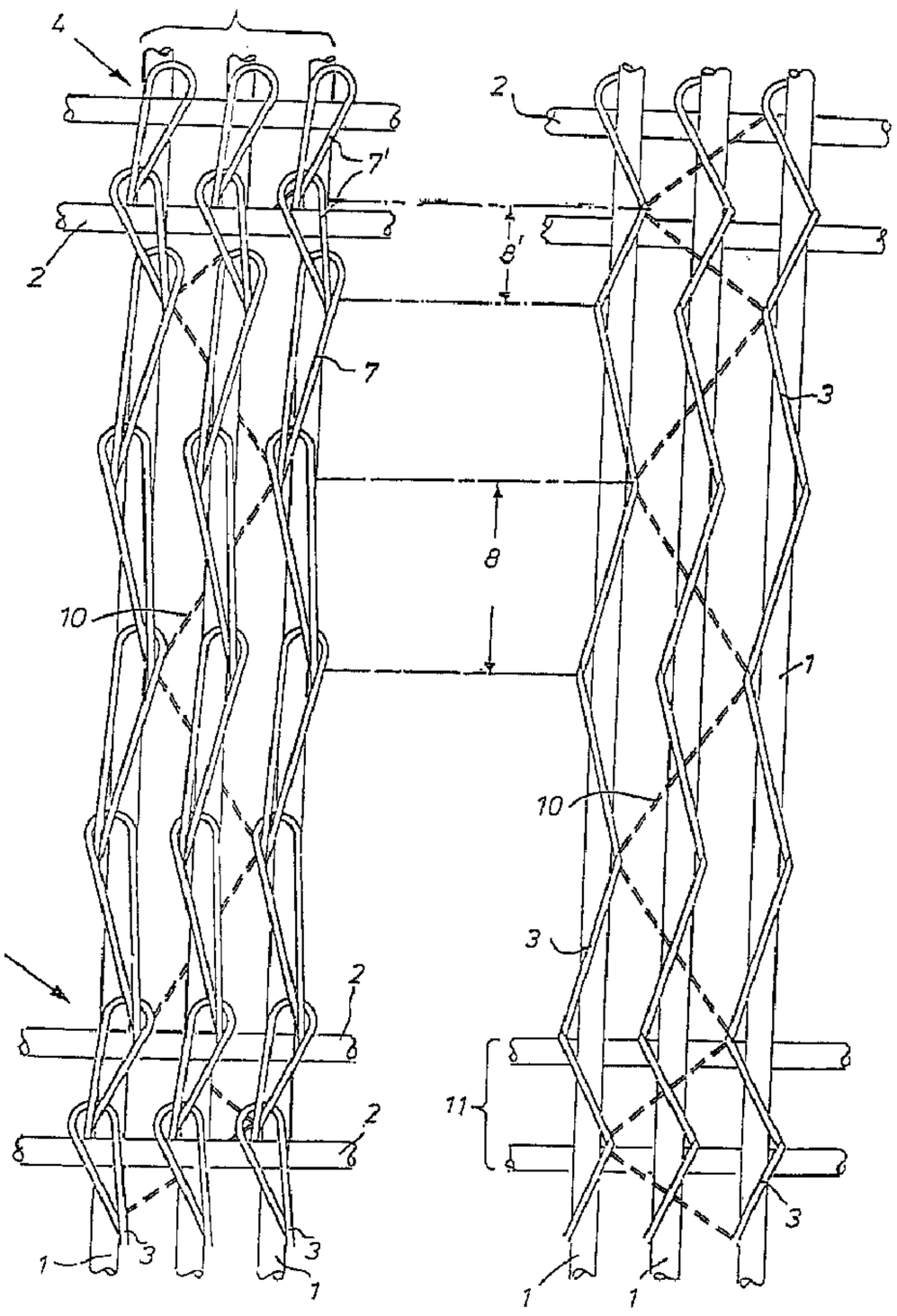

(57) Abrégé/Abstract:
The invention relates in particular to a textile geomesh comprising linearly extending warp threads (1) and weft threads (2) which extend linearly substantially at a right angle to the warp threads and which are joined to the warp threads (1) by means of fixing

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(57) Abrégé(suite)/Abstract(continued):
threads (3) which are applied by warp knitting and the meshes of which extend around the warp threads (1) over the entire length and the weft threads (2) in the region of the intersections (4), wherein the warp threads (1) and the weft threads (2) are arranged individually or in groups at relatively large spacings which produce the internal widths (5) of the mesh (6). The object of the invention is to attain an improved join between warp threads and weft threads without requiring additional fixing threads or stronger fixing threads. To attain that object in the regions in which the weft threads (2) cross the warp threads (1) the lengths of the meshes (7) of the fixing threads (3) are markedly shorter than in the regions of the mesh structure which are located therebetween.

ABSTRACT

The invention relates in particular to a textile geomesh comprising linearly extending warp threads (1) and weft threads (2) which extend linearly substantially at a right angle to the warp threads and which are joined to the warp threads (1) by means of fixing threads (3) which are applied by warp knitting and the meshes of which extend around the warp threads (1) over the entire length and the weft threads (2) in the region of the intersections (4), wherein the warp threads (1) and the weft threads (2) are arranged individually or in groups at relatively large spacings which produce the internal widths (5) of the mesh (6). The object of the invention is to attain an improved join between warp threads and weft threads without requiring additional fixing threads or stronger fixing threads. To attain that object in the regions in which the weft threads (2) cross the warp threads (1) the lengths of the meshes (7) of the fixing threads (3) are markedly shorter than in the regions of the mesh structure which are located therebetween.

Textile mesh structure, in particular a geomesh

The invention relates to a textile mesh structure, in particular a geomesh, comprising linearly extending warp threads and weft threads which extend linearly substantially at a right angle to the warp threads and which are joined to the warp threads by means of fixing threads which are applied by warp knitting and the meshes of which extend around the warp threads over the entire length and the weft threads in the region of the intersections, wherein the warp threads and the weft threads are arranged individually or in groups at relatively large spacings which produce the internal widths of the mesh.

Textile mesh structures of that kind are known from US patents Nos. 4 472 086 and 4 540 311. The linearly extending and load-carrying warp threads and weft threads of the mesh preferably comprise high-module polyester yarns or other high-strength filament yarns, for example of polyamide. The fixing thread which is knitted onto the structure and which joins the warp threads to the weft threads in the form of knitted meshes or tricot meshes is considerably weaker in terms of its thread strength than the warp threads and the weft threads.

If necessary that mesh structure after manufacture thereof is encased with a soft plastic material, for example PVC, with a bitumen emulsion or with latex.

The invention seeks to provide a better join between the warp threads and the weft threads without requiring additional fixing threads or stronger fixing threads.

In accordance with the invention in the regions in which the weft threads cross the warp threads the lengths of the meshes of the fixing threads are markedly shorter than in the regions which are therebetween.

According to one aspect of the present invention there is provided a textile mesh structure comprising: linearly extending warp threads; linearly extending weft threads positioned substantially at a right angle to said warp threads; fixing threads arranged to join said warp and weft threads, said fixing threads being applied by warp knitting to form thread meshes; said thread meshes being arranged to extend around said warp threads over an entire length of said warp

threads and around said weft threads in regions in which said warp threads and weft threads intersect; said warp threads and said weft treads being arranged individually or in groups at relatively large spacings in order to form internal widths; and in said regions in which said warp threads and said weft threads intersect, lengths of said thread meshes are shorter than in regions between intersect regions.

According to a further aspect of the present invention there is provided a process for forming a textile mesh structure comprising: linearly extending warp threads; linearly extending weft threads at substantially a right angle to the warp threads; and warp knitting fixing threads to join the warp and weft threads, whereby thread meshes are formed, wherein the thread meshes are arranged to extend around the warp threads over an entire length of the warp threads and around the weft threads in regions in which the warp threads and weft threads intersect, and wherein, in the regions in which the warp threads and the weft threads intersect, lengths of the thread meshes are formed to be shorter than in regions between intersect regions.

According to another aspect of the present invention there is provided a textile mesh structure comprising: linearly extending warp threads; linearly extending weft threads positioned substantially at a right angle to said warp threads; fixing threads arranged to join said warp and weft threads, said fixing threads being applied by warp knitting to form thread meshes; said thread meshes being arranged to extend around said warp threads over an entire length of said warp threads and around said weft threads in regions in which said warp threads and weft threads intersect; said warp threads and said weft threads being arranged one of individually or in groups at relatively large spacings in order to form internal widths; in said regions in which said warp threads and said weft threads intersect, lengths of said thread meshes are shorter than in regions between intersect regions; and a non-woven material layer, wherein one of joining threads and said fixing threads are one of knitted on and applied by Raschel knitting to join said warp and said weft threads to said non-woven material layer.

According to a still further aspect of the present invention there is provided a process for forming a textile mesh structure comprising: linearly extending warp threads; linearly extending weft threads at substantially a right angle to the warp threads; and warp knitting fixing threads to join the warp and weft treads, whereby thread meshes are formed, wherein the thread meshes are arranged to extend around the warp threads over an entire length of the warp threads and around the weft treads in regions in which the warp threads and weft threads intersect, wherein, in the regions in which the warp threads and the weft threads intersect, lengths of the thread meshes are formed to be shorter than in regions between intersect regions, and joining the warp and weft threads to a non-woven material layer.

According to another aspect of the present invention there is provided a textile mesh structure comprising: linearly extending warp threads; linearly extending weft threads positioned substantially at a right angle to said warp threads; fixing threads joining said warp and weft threads; each fixing thread extends around each warp thread over an entire length of each warp thread and around each weft thread in regions in which said warp threads and weft threads intersect, wherein said fixing threads are applied by warp knitting to form thread meshes along each warp thread and around each weft thread in regions in which said warp threads and weft threads intersect; said warp threads and said weft threads being arranged in groups; in regions in which said warp threads and said weft threads intersect, lengths of the thread meshes are shorter than in regions between the regions in which said warp threads and said weft threads intersect; spacings having internal widths being defined by the regions between the regions in which said warp threads and said weft threads intersect; and each group of warp threads being joined together by a joining thread, wherein the internal widths are greater than widths of the groups of said warp threads and said weft threads.

Advantageously, the length of the meshes of the fixing threads in the regions in which the weft threads cross the warp threads is at least 30% shorter than the length of the meshes between the intersection regions. That measure provides for a considerable saving in terms of fixing threads or fixing yarn without

any fear of an adverse influence on the strength of the mesh structure. The manufacturing speed of those textile mesh structures is also increased.

Further features of the invention are set forth in the claims.

An embodiment of the invention is described in greater detail in the description hereinafter with reference to the drawings in which:

Figure 1 is a diagrammatic view of the textile mesh structure, in accordance with the invention,

Figure 2 is a view on an enlarged scale of a register round or repeat of the mesh structure from one side, and

Figure 3 is a view on an enlarged scale of a register round or repeat of the mesh structure from the other side.

The textile mesh structure shown in Figure 1 is composed of linearly extending warp threads 1 and weft threads 2 which extend at a right angle to the warp threads 1. Each three warp threads 1 are combined to form a respective warp thread group 9. In addition each two weft threads 2 are combined to form a respective weft thread group 11. The weft threads 2 are joined to the warp threads 1 by means of fixing threads 3 which are knitted thereon. The meshes of the fixing threads 3 extend in a zig-zag configuration over the warp threads 1. The warp thread groups 9 and the weft thread groups 11 are arranged at relatively large spacings which afford the internal widths 5 of the mesh 6.

In accordance with the invention, in the regions 4 in which the weft threads 2 cross the warp threads 1, the lengths 8' of the meshes 7' of the

fixing threads 3 are markedly shorter than in the regions therebetween of the mesh structure.

As Figures 2 and 3 in particular show the lengths 8' of the meshes 7' or the threads loops of the fixing threads 3 in the regions 4 in which the weft threads 2 intersect the warp threads 1 are at least 30% and preferably 50% shorter than the lengths 8 of the meshes 7 between the intersection regions 4. In the intersection regions 4, a mesh 7' of the fixing threads 3 can be associated with each weft thread 2 per warp thread 1.

So that the warp threads 1 are secured to prevent lateral displacement thereof, a joining yarn 10 is applied by a Raschel knitting procedure, for holding the warp threads 1 of a warp thread group 9 together or securing them to prevent lateral displacement. That joining yarn 10 can either extend around the warp threads 1 of a warp thread group 9 in a zig-zag configuration or, as shown in Figures 2 and 3, the fixing threads 3 of each warp thread group 9. It is however also possible for the warp threads 1 of a warp thread group 9 to be secured to prevent lateral displacement by the fixing threads 3 of a warp thread group 9 changing by tricot thread laying from one warp thread 1 of a warp thread group 9 to the adjacent warp thread 1 of the same warp thread group 9.

The textile mesh structure according to the invention can also be combined in known manner with a non-woven material layer.

List of references

1 warp threads

2 weft threads

3 fixing threads

4 intersection region

5 internal width

6 mesh structure

7 mesh

7′ mesh in the region of the intersection 4

8 length of the mesh 7

8′ length of the mesh 7′

9 warp thread group

10 joining yarn

11 weft thread group

CLAIMS:

1. A textile mesh structure comprising:

linearly extending warp threads;

linearly extending weft threads positioned substantially at a right angle to said warp threads;

fixing threads arranged to join said warp and weft threads, said fixing threads being applied by warp knitting to form thread meshes;

said thread meshes being arranged to extend around said warp threads over an entire length of said warp threads and around said weft threads in regions in which said warp threads and weft threads intersect;

said warp threads and said weft threads being arranged individually or in groups at relatively large spacings in order to form internal widths; and

in said regions in which said warp threads and said weft threads intersect, lengths of said thread meshes are shorter than in regions between intersect regions.

2. The mesh structure in accordance with claim 1, wherein said textile mesh structure is structured as a geomesh.

3. The mesh structure in accordance with claim 1 or 2, wherein said lengths of said thread meshes in said intersect regions are at least 30% shorter than said lengths of the meshes between said intersect regions.

4. The mesh structure in accordance with any one of claims 1 to 3, wherein, in said intersect regions, said lengths of said thread meshes are structured and arranged such that a mesh is associated with each weft thread.

5. The mesh structure in accordance with claim 4, wherein said weft threads are arranged in weft thread groups comprising a plurality of weft threads, and said lengths of said thread meshes are structured and arranged such that a mesh is

associated with each weft thread of said weft thread group.

6. The mesh structure in accordance with any one of claims 1 to 5, wherein a fixing thread is associated with each warp thread to form a warp mesh.

7. The mesh structure in accordance with any one of claims 1 to 6, wherein said warp threads are arranged in warp groups including at least two warp threads positioned in closer relation to each other than to adjacent warp groups.

8. The mesh structure in accordance with claim 7, further comprising a joining thread arranged in a zig-zag configuration to prevent lateral displacement of said warp threads of said warp group.

9. The mesh structure in accordance with claim 7, wherein each fixing thread of said warp group is associated with each warp thread.

10. The mesh structure in accordance with claim 9, further comprising joining threads extending in a zig-zag configuration to prevent lateral displacement of said fixing threads.

11. The mesh structure in accordance with any one of claims 1 to 10, further comprising a non-woven material layer, wherein one of joining threads and said fixing threads are one of knitted on and applied by Raschel knitting to join said warp and said weft threads to said non-woven material layer.

12. A process for forming a textile mesh structure comprising:

linearly extending warp threads;

linearly extending weft threads at substantially a right angle to the warp threads; and

warp knitting fixing threads to join the warp and weft threads, whereby thread meshes are formed,

wherein the thread meshes are arranged to extend around the warp threads over an entire length of the warp threads and around the weft threads in regions in which the warp threads and weft threads intersect, and

wherein, in the regions in which the warp threads and the weft threads intersect, lengths of the thread meshes are formed to be shorter than in regions between intersect regions.

13. The process in accordance with claim 12, wherein the warp threads and the weft threads are arranged individually or in groups, such that, spacing between threads in a group is smaller than spacing between adjacent groups.

14. The process in accordance with claim 12 or 13, further comprising arranging a joining thread in a zig-zag configuration to prevent lateral displacement of the warp threads of a warp group.

15. The process in accordance with any one of claims 12 to 14, further comprising arranging a joining thread in a zig-zag configuration to prevent lateral displacement of the fixing threads.

16. The process in accordance with any one of claims 12 to 15, further comprising joining the warp and weft threads to a non-woven material layer.

17. The process in accordance with any one of claims 12 to16, wherein the joining includes one of knitting on and applying by Raschel knitting.

18. A textile mesh structure comprising:

linearly extending warp threads;

linearly extending weft threads positioned substantially at a right angle to said warp threads;

fixing threads arranged to join said warp and weft threads, said fixing threads being applied by warp knitting to form thread meshes;

said thread meshes being arranged to extend around said warp threads over an entire length of said warp threads and around said weft threads in regions in which said warp threads and weft threads intersect;

said warp threads and said weft threads being arranged individually or in groups at relatively large spacings in order to form internal widths;

in said regions in which said warp threads and said weft threads intersect, lengths of said thread meshes are shorter than in regions between intersect regions; and

a non-woven material layer,

wherein one of joining threads and said fixing threads are knitted on or applied by Raschel knitting to join said warp and said weft threads to said non-woven material layer.

19. A process for forming a textile mesh structure comprising:

linearly extending warp threads;

linearly extending weft threads at substantially a right angle to the warp threads; and

warp knitting fixing threads to join the warp and weft treads, whereby thread meshes are formed,

wherein the thread meshes are arranged to extend around the warp threads over an entire length of the warp threads and around the weft treads in regions in which the warp threads and weft threads intersect,

wherein, in the regions in which the warp threads and the weft threads intersect, lengths of the thread meshes are formed to be shorter than in regions between intersect regions, and

joining the warp and weft threads to a non-woven material layer.

20. A textile mesh structure comprising:

linearly extending warp threads;

linearly extending weft threads positioned substantially at a right angle to said warp threads;

fixing threads joining said warp and weft threads;

each fixing thread extends around each warp thread over an entire length of each warp thread and around each weft thread in regions in which said warp threads and weft threads intersect, wherein said fixing threads are applied by warp knitting to form thread meshes along each warp thread and around each weft thread in regions in which said warp threads and weft threads intersect;

said warp threads and said weft threads being arranged in groups;

in regions in which said warp threads and said weft threads intersect, lengths of the thread meshes are shorter than in regions between the regions in which said warp threads and said weft threads intersect;

spacings having internal widths being defined by the regions between the regions in which said warp threads and said weft threads intersect; and

each group of warp threads being joined together by a joining thread,

wherein the internal widths are greater than widths of the groups of said warp threads and said weft threads.

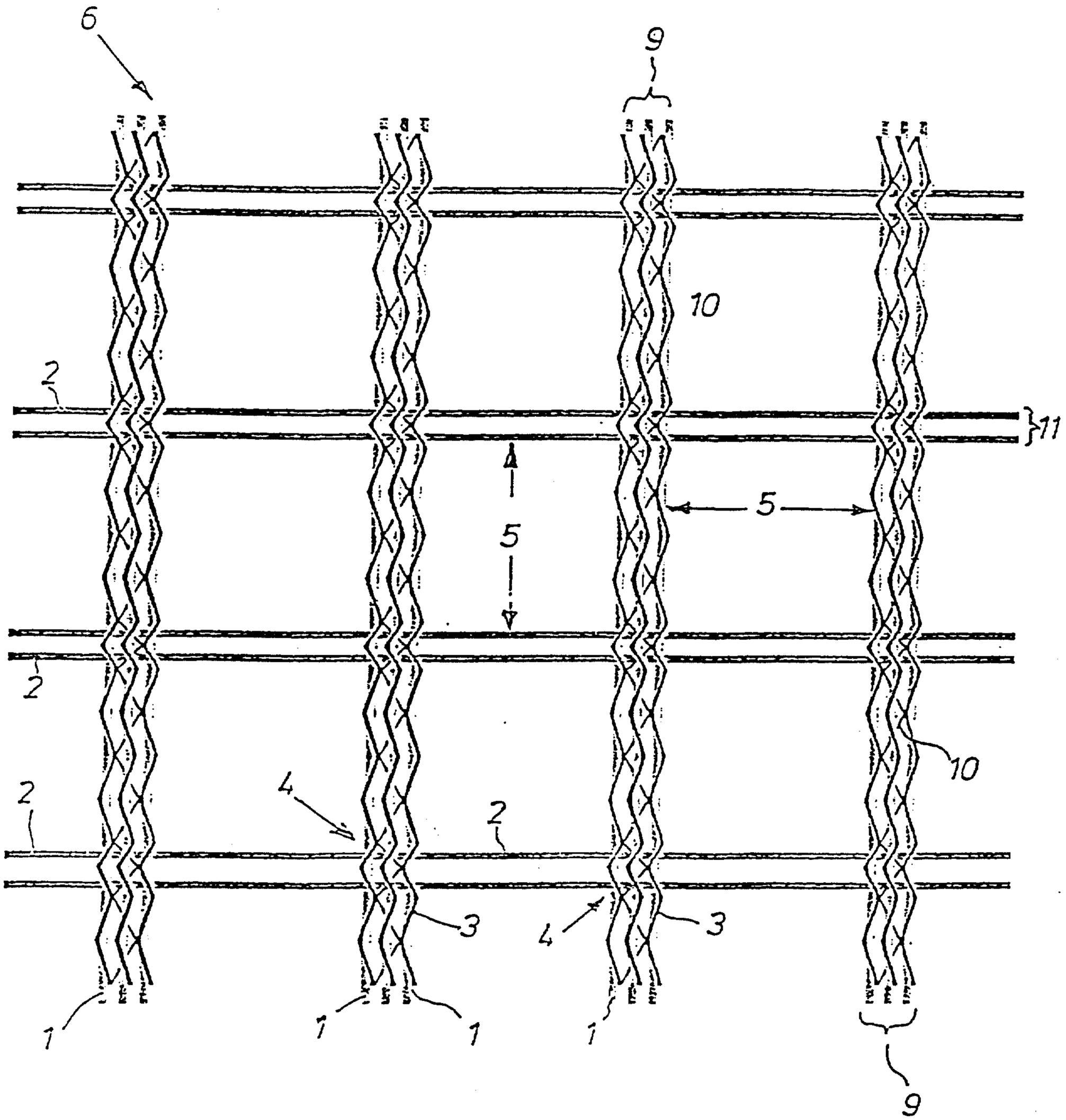

FIG. 1

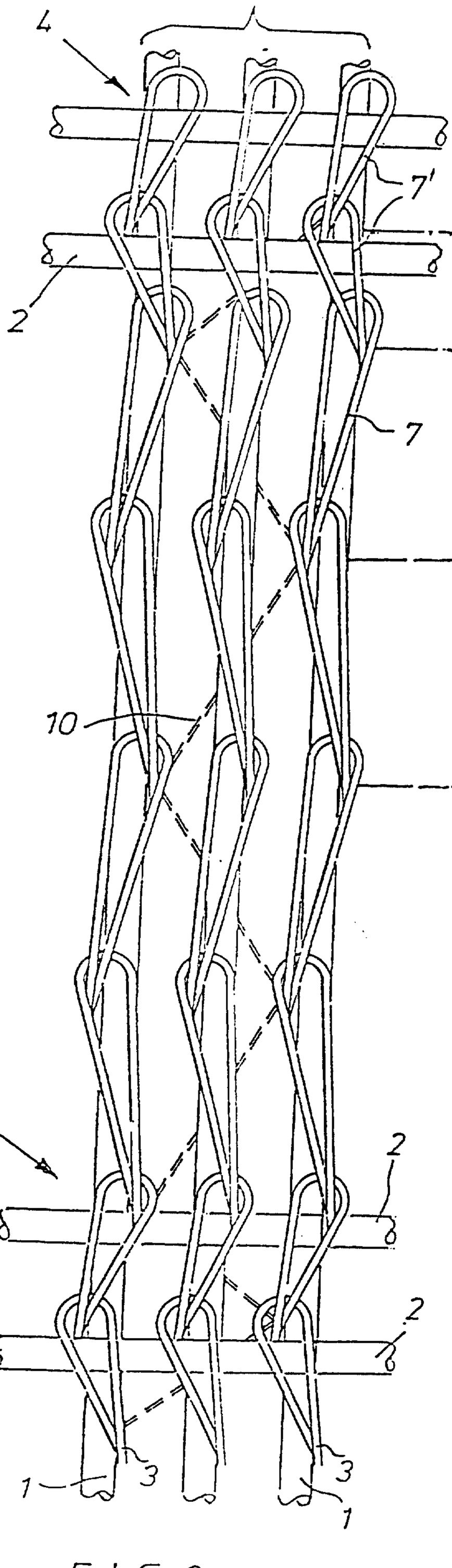

FIG. 2

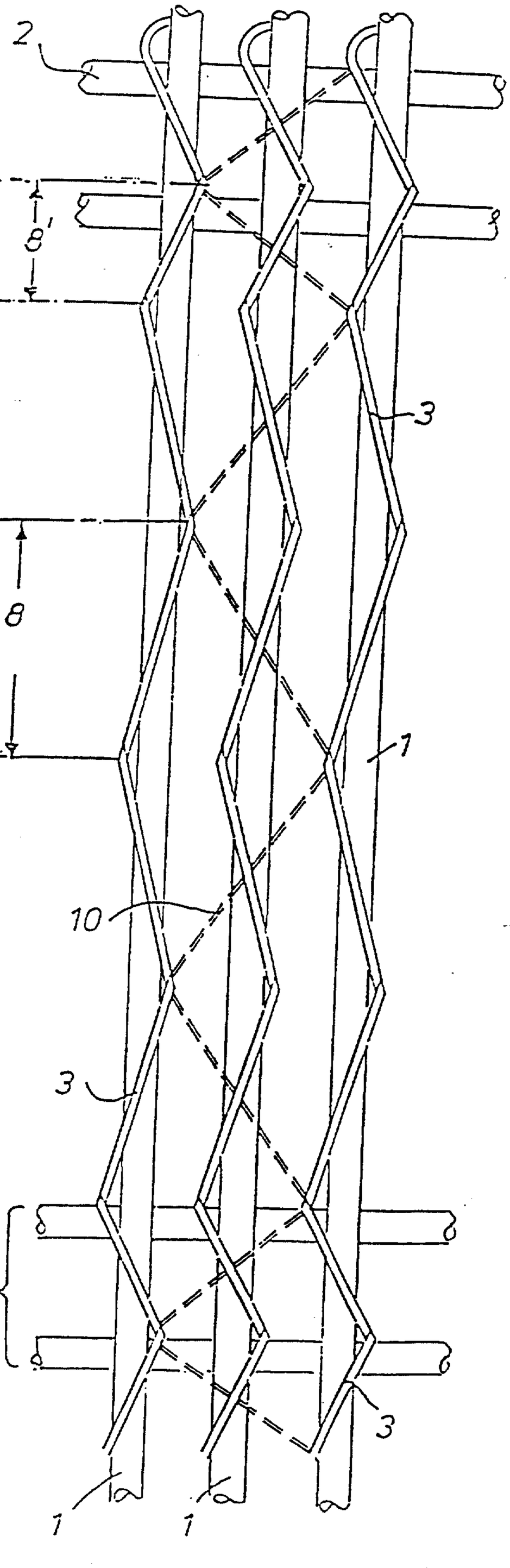

FIG. 3

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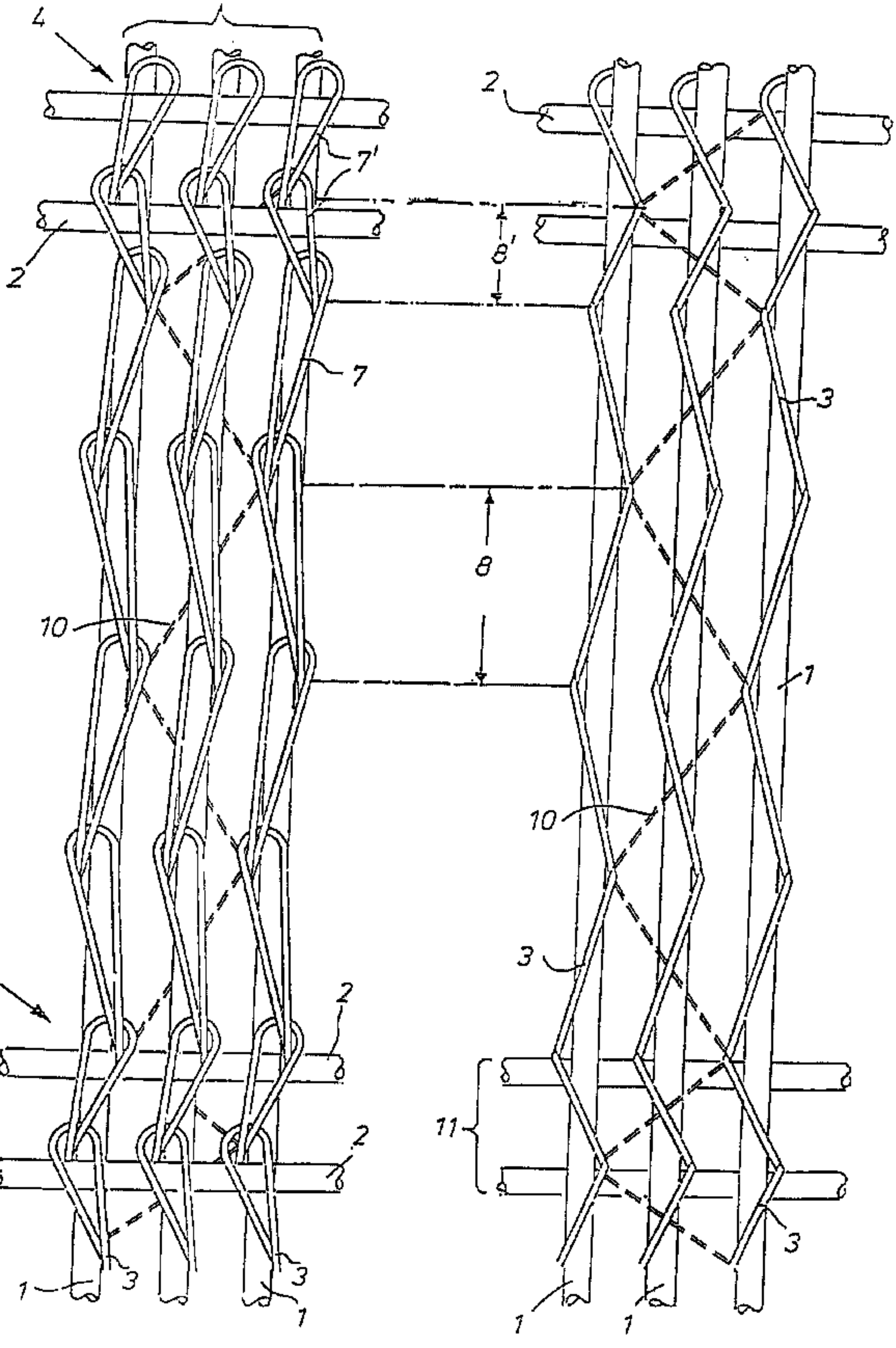
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