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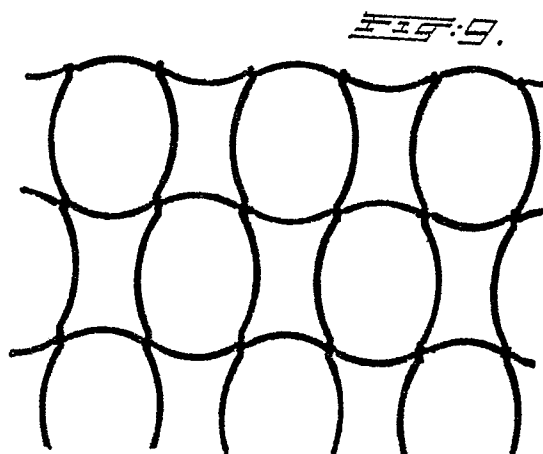
①㉓ Applicant: **N.V. BEKAERT S.A.**
Bekaertstraat 2
B-8550 Zwevegem(BE)

①㉔ Inventor: **Bruggeman, Frans**
Dorenstraat 4
B-9690 Kuisbergen - Zulzeke(BE)

①㉕ Representative: **Demeester, Gabriel et al,**
N.V. Bekaert S.A. Bekaertstraat 2
B-8550 Zwevegem(BE)

①㉖ **Method for manufacturing metal wire netting.**

①㉗ This invention relates to a method for manufacturing metal wire netting whereby intersecting wires are welded together at the crossing points while forming meshes and the thus formed wire netting is subjected to a mechanical operation resulting in a deformation of at least a part of the meshes; whereby the deformation is carried out with the help of deformation means engaging into the meshes to be directly deformed and whereby in each of the meshes to be directly deformed, all intersecting wires are deformed with respect to the condition prior to the deformation operation. The invention also relates to the so-manufactured metal wire nettings.



METHOD FOR MANUFACTURING METAL WIRE NETTING

5 The invention relates to a method for manufacturing metal wire netting whereby intersecting wires are welded together at the crossing points while forming meshes and the thus obtained wire netting is subjected to a mechanical operation resulting in a deformation of at least a part of the meshes.

10 Such metal wire netting the meshes of which have been deformed with respect to the original condition by a mechanical operation, is known and is mainly applied as ornamental wire netting in e.g. garden fences. Such known wire netting is manufactured departing from intersecting wires, whether or not shaped, whether or not straight, which are welded together at the crossing points. The thus formed wire netting is thereupon fixed and mechanically treated in such a way
15 that the wires running in one and the same direction of part of or all the meshes of the thus formed wire netting are always deformed with respect to the original condition. The deformation of wires that run in one and the same direction solely, makes high demands upon the fixation of the wire
20 netting during this deformation treatment ; whereby fixation faults easily cause excessive, total deformation of or damage to the wire netting.

25 Another disadvantage of the deformation of only the wires running in one and the same direction of part of or all the meshes of the thus formed wire netting, consists in that it only allows to obtain a limited number of shapes or patterns of the deformed meshes.

30 The purpose of the present invention is to provide suchlike method overcoming the aforementioned disadvantages.

To that end, the method according to the invention is characterized in that the deformation is carried out with the help of deformation means engaging into the meshes to be directly deformed and that in each of the meshes to be directly deformed, all the intersecting wires are deformed with respect to the condition prior to the deformation operation.

In the method according to the invention a distinction is made between meshes to be directly deformed and meshes that are to be indirectly deformed. Meshes to be directly deformed are meshes that are directly engaged by a means of deformation resulting in deformation of said meshes ; meshes to be indirectly deformed are meshes that are deformed as a result of a means of deformation engaging one or more adjacent meshes resulting in an indirect deformation of said meshes, which meshes are not treated by a means of deformation.

Due to the fact that by said method according to the invention all intersecting wires of a mesh to be directly deformed are deformed with respect to the original condition, the risk of damage to the welded wire netting in case of deficient fixation is strongly reduced. If the symmetry of the mesh is maintained during the deformation operation, no damage to the welded wire netting will be possible even if the wire netting has not been fixed at all, as in that case the wire netting will not tend to shift as a result of the deformation operation.

By the maintenance of the symmetry during the deformation operation is understood, that a welded wire netting is formed the meshes of which have prior to the deformation operation a shape, which is symmetrical with respect to at least one axis, and that after the deformation operation, the meshes

to be directly deformed have also a shape, which is symmetrical with respect to at least one axis. Preferably, a welded wire netting is formed the mesh of which have prior to the deformation operation a shape, which is symmetrical with respect to at least two axes perpendicular to each other, and whereby after the deformation operation, the meshes to be directly deformed have also a shape, which is symmetrical with respect to at least two axes perpendicular to each other.

The deformation operation can be carried out in such a way that the welded crossing points of the intersecting wires remain substantially in the same place with respect to each other or in other words, the wires constituting the meshes of the wire netting will be allowed to deform, but the angular points of the meshes will remain substantially in their place with respect to each other. It is also possible, that the meshes of the welded wire netting will be allowed to deform, but that the total length of the wires or sides of the meshes will be substantially equal to the length thereof before the deformation operation.

In particular, in the method according to the invention, a welded wire netting is formed the meshes of which have a quadrangular shape prior to the deformation operation, such as a rectangular and a square shape. In this case, it is possible that at least the meshes to be directly deformed obtain an n-angular shape, whereby n is greater than 4. By such method a wire netting is obtained wherein each of the wires of the meshes to be directly deformed contains one or more bends and wherein the wire lengths between the different bends and angular points have remained substantially straight. In an attractive embodiment this is the way in which a quadrangular mesh is converted into an octagonal mesh.

In an advantageous embodiment of the method according to the invention all the intersecting wires of each of the meshes to be directly deformed obtain an at least partly bent shape through the deformation operation. Preferably, all the intersecting wires of each of the meshes to be directly deformed are deformed over substantially the whole length thereof.

With particularly great advantage, by the method according to the invention the deformation operation is applied to a maximum of 50 % of the total number of the meshes. Through the all-sided deformation of the meshes to be directly deformed it is attained that also the meshes that are not engaged by a means of deformation, are deformed with respect to the original condition. Taking this aspect into account, only a maximum of 50 % of all the meshes will finally need to be deformed to attain a deformation of all the meshes as a result of the deformation operation ; 50 % of all the meshes are in that case directly deformed and 50 % of all the meshes are in that case indirectly deformed. Consequently, this condition results in a strong decrease of the required number of deformation operations, or, alternatively, the required number of means of deformation per surface of wire netting.

With very great advantage, by the method according to the invention a welded wire netting is formed wherein the meshes adjacent to the edges have a smaller surface than the other meshes, the dimensions of the means of deformation engaging the marginal meshes being adapted accordingly. Due to the fact that the surface of the so-called marginal meshes is smaller than the surface of the meshes in the rest of the wire netting, a reinforcing effect is attained at the edges of the wire netting, e.g. facilitating the fixation of such wire netting to posts or other fixation places and improving the maintenance of such wire netting during use.

The invention will hereinafter be illustrated with the help of the drawing, wherein :

- 5 fig. 1 represents a welded wire netting with square meshes, with a schematic indication of minimum and maximum size of deformation means.
- fig. 2 represents a wire netting as in figure 1 during a deformation treatment with the highest frequency.
- 10 fig. 3 represents a wire netting as in figure 1 and 2 with a schematic indication of differently shaped deformation means.
- fig. 4 represents a welded wire netting with rectangular meshes and a schematic indication of minimum and maximum size of adapted deformation means.
- 15 fig. 5 represents a welded wire netting with triangular meshes and a schematic indication of minimum and maximum size of adapted deformation means.
- fig. 6 represents a form of wire netting attained by carrying out the deformation operation schematically represented in figure 1.
- 20 fig. 7 represents a form of wire netting after application of the deformation operation with the highest frequency schematically indicated in figure 2.
- fig. 8 represents a form of wire netting with a deformation operation applied thereto as schematically indicated in figure 3.
- 25 fig. 9 represents a form of wire netting after application of the deformation operation applied thereto as schematically indicated in figure 4.
- 30 fig. 10 represents a form of wire netting with a deformation operation applied thereto as schematically indicated in figure 5.

In figure 1 reference number 1 indicates a mesh to be directly deformed, while reference number 10 indicates a mesh to be

indirectly, partly deformed and reference number 20 a mesh not to be deformed. The wires 2 and 3 intersect and are welded to each other at crossing points 4. In the meshes 1 to be directly deformed, dotted lines indicate the size at introduction and the maximum size of a deformation instrument whereby an at least partly bent final shape of each of the wires 2 and 3 bounding the mesh to be directly deformed is brought about. In this case, the maximum deformation to be attained is such that the square mesh obtains a substantially circular shape, whereby the original welded points 4 lying on this circle. In the direct area of the welded points 4, the bent wires 2 and 3 show a bend.

In figure 2, the meshes to be directly deformed are again indicated by 1 and the central mesh to be deformed indirectly yet all-sidedly is indicated by 11. In this case, a direct deformation of 50 % of the total number of meshes is required to deform all meshes of the original welded wire netting. Here again, in the direct area of the welded points 4, the bent wires 2 and 3 show a bend in the wire, because the meshes 1 to be directly deformed are deformed over substantially the whole length of the sides 2, 3 of the meshes 1.

In figure 3, yet another shape is indicated, the inside dotted line again representing a possible size and shape of the means of deformation at introduction into the mesh 1, and the outside dotted line representing a maximum final shape that can be realized of the mesh 1. The meshes to be indirectly deformed are again indicated by 10, while the meshes that are not to be deformed are indicated by 20.

Figure 4 represents a welded wire netting with rectangular meshes. The meshes to be directly deformed are again indicated by 1 and the central mesh to be deformed indirectly

yet all-sidedly is indicated by 11. The inside dotted line again representing a possible size and shape of the means of deformation at introduction into the mesh 1, and the outside dotted line representing a maximum final shape that can be realized of the mesh 1. These rectangular meshes have prior to the deformation operation a shape, which is symmetrical with respect to two axes 5 and 6, which are perpendicular to each other.

Figure 5 represents a welded wire netting with triangular meshes. The meshes to be directly deformed are again indicated by 1. The triangular meshes are symmetrical with respect to one axis 5.

Figures 6, 7, 8, 9 and 10 represent possible shapes resulting from the deformation methods according to the invention schematically indicated in figures 1, 2, 3, 4 and 5 and which have been applied to welded wire netting with square, rectangular and triangular meshes.

The used wires 2 and 3 are preferably made of steel wire with a low carbon content, e.g. lower than 0,1 % carbon (weight percentage). These wires 2 and 3 are preferably annealed to obtain good deformation characteristics.

The invention is not limited to the represented mesh shapes, e.g. hexagonal mesh types can be treated in the same way and meshes the wires of which have no straight original shape can also be treated in the same way. A lot of attention is paid to quadrangular mesh types because such mesh types are very frequently applied in practice.

CLAIMS :

1. Method for manufacturing metal wire netting whereby
intersecting wires are welded together at the crossing points
5 while forming meshes and the thus formed wire netting is
subjected to a mechanical operation resulting in a deformation
of at least a part of the meshes, characterized in, that
the deformation is carried out with the help of deformation
means engaging into the meshes (1) to be directly deformed
10 and that in each of the meshes (1) to be directly deformed,
all intersecting wires (2, 3) are deformed with respect to
the condition prior to the deformation operation.

2. Method according to claim 1, characterized in, that
15 a welded wire netting is formed the meshes of which have
prior to the deformation operation a shape, which is symmetrical
with respect to at least one axis, and that after the
deformation operation, the meshes (1) to be directly deformed
have also a shape, which is symmetrical with respect to at
20 least one axis.

3. Method according to claim 2, characterized in, that
a welded wire netting is formed the meshes of which have
prior to the deformation operation a shape, which is symmetrical
25 trical with respect to at least two axes perpendicular to
each other, and that after the deformation operation, the
meshes (1) to be directly deformed have also a shape, which
is symmetrical with respect to at least two axes perpendicular
to each other.

30 4. Method according to claim 3, characterized in, that
the meshes of the welded wire netting prior to the deformation
operation are quadrangular.

5. Method according to claim 4, characterized in, that the meshes of the welded wire netting prior to the deformation operation are rectangular.

5 6. Method according to one or more of the claims 1 - 5, characterized in that through the deformation operation at least the meshes (1) to be directly deformed obtain an n-angular shape, whereby n is > 4.

10 7. Method according to one or more of the claims 1 - 5, characterized in that through the deformation operation all the intersecting wires (2, 3) of each of the meshes (1) to be directly deformed obtain an at least partly bent shape.

15 8. Method according to claim 7, characterized in that all the intersecting wires (2, 3) of each of the meshes (1) to be directly deformed are deformed over substantially the whole length thereof.

20 9. Method according to one or more of the claims 1 - 8, characterized in that the deformation operation is applied to a maximum of 50 % of the total number of the meshes (1).

25 10. Method according to one or more of the claims 1 - 9, characterized in that a welded wire netting is formed of which the meshes adjacent to the edges have a smaller surface than the other meshes and that the dimensions of the deformation means engaging the marginal meshes have been adapted accordingly.

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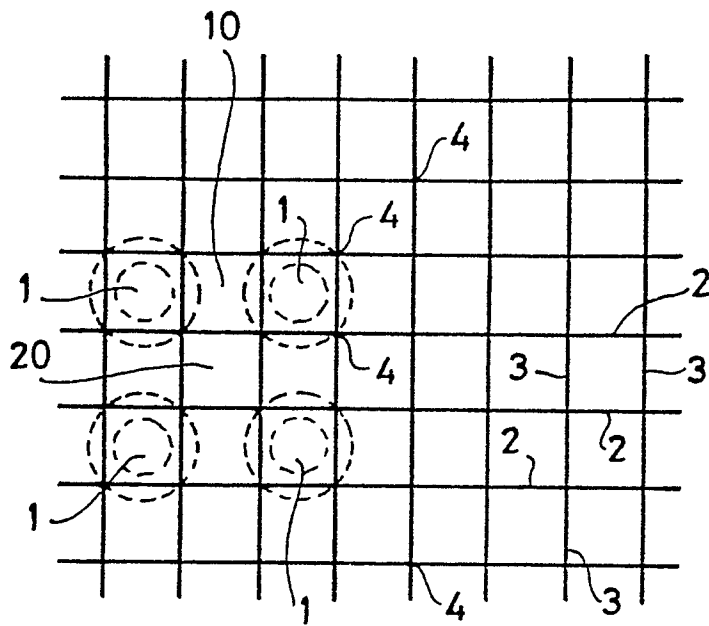


FIG. 1.

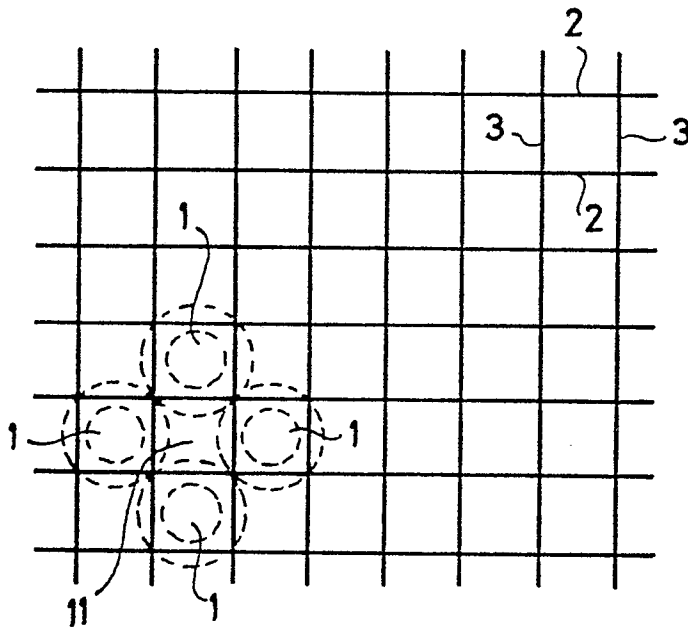


FIG. 2.

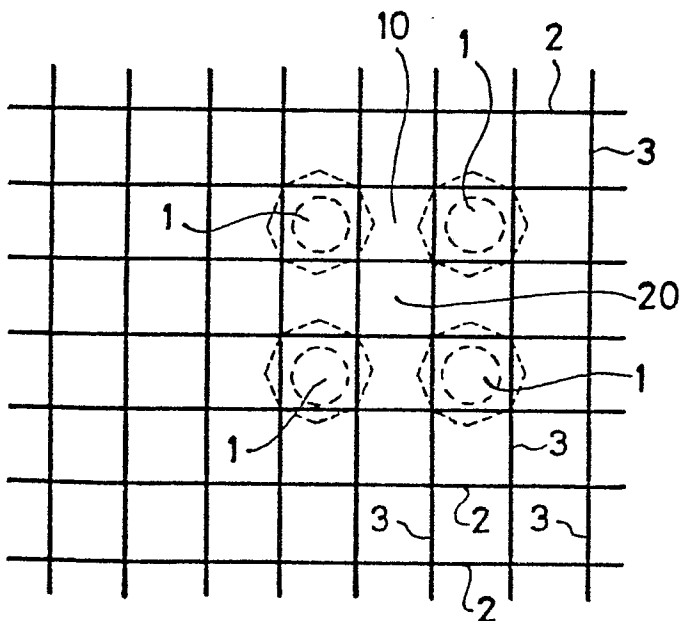


FIG. 3.

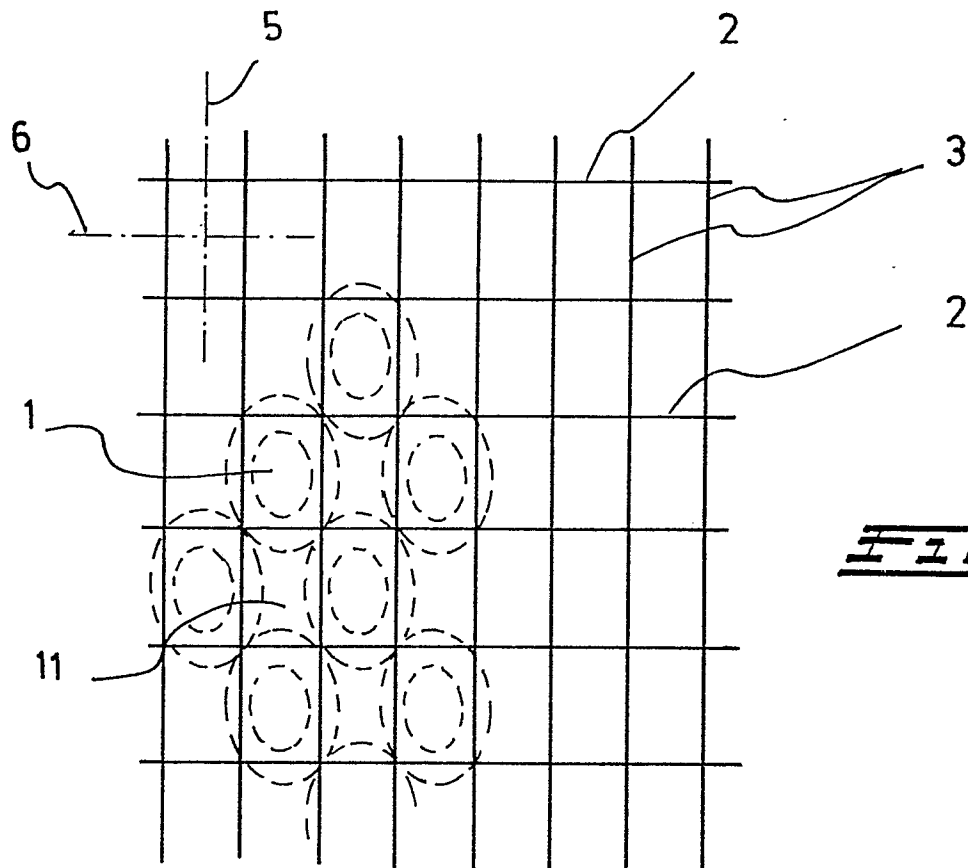


FIG: 4

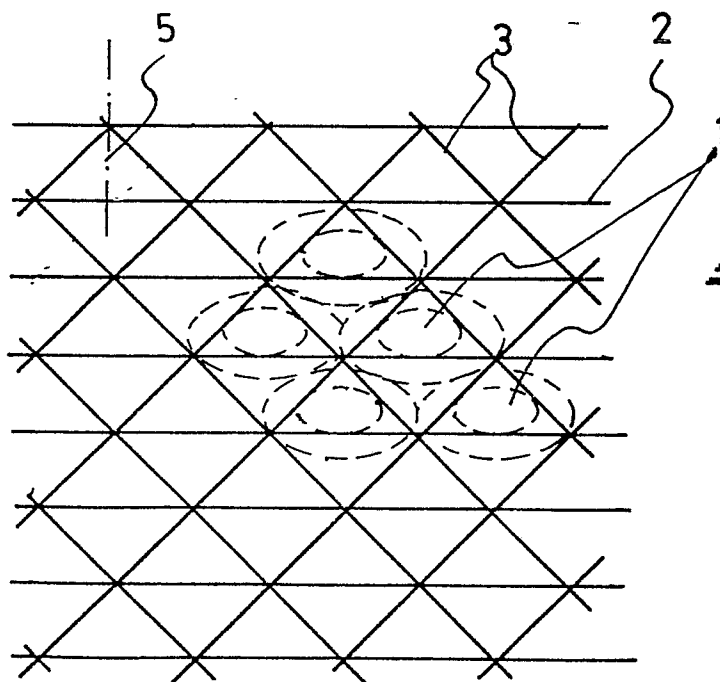


FIG: 5

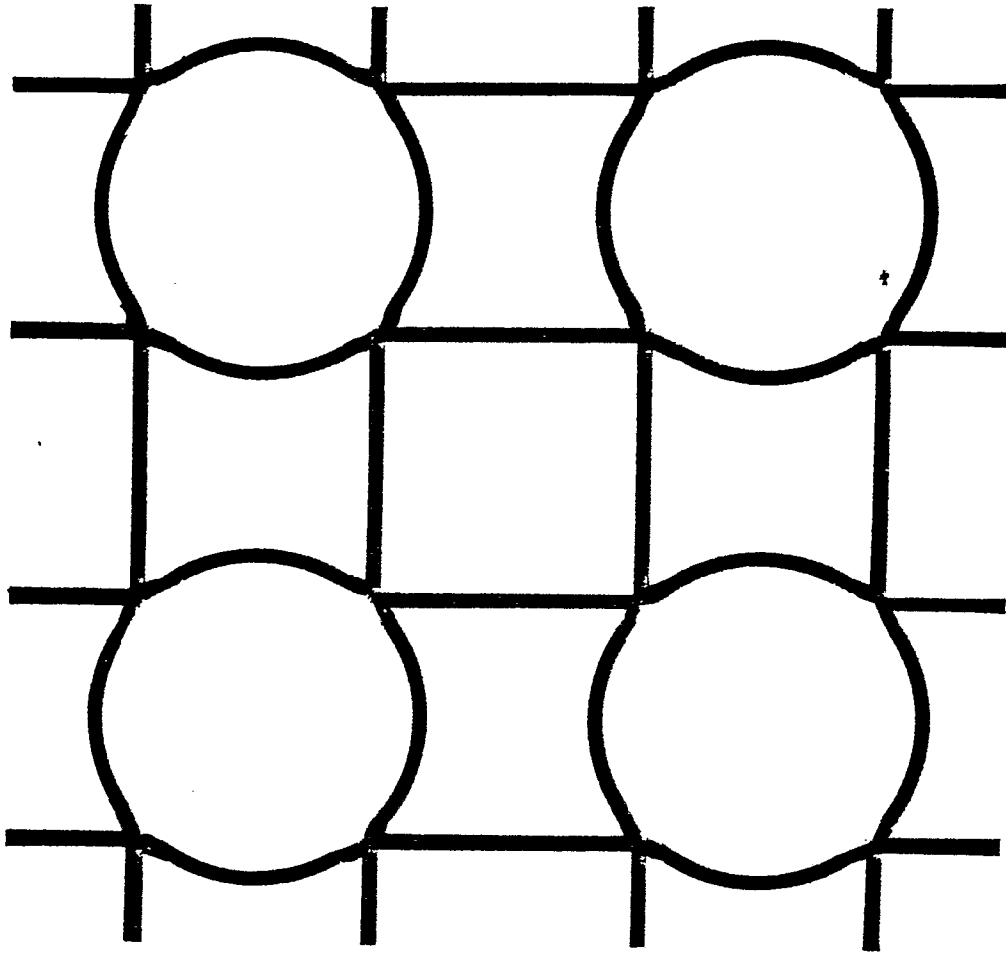


FIG. 6.

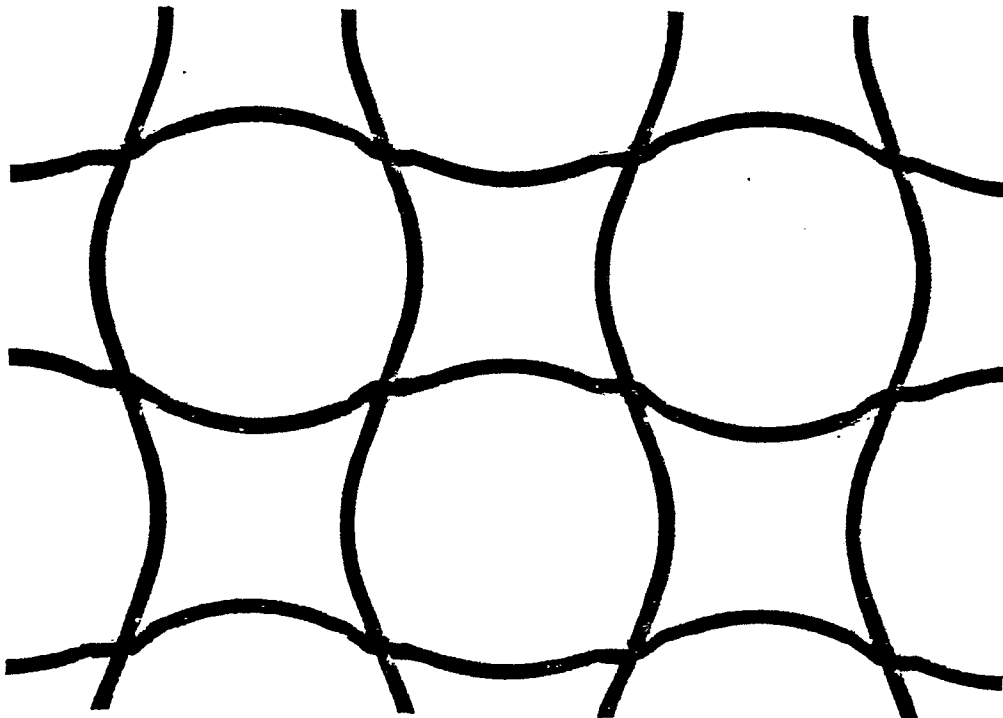


FIG. 7.

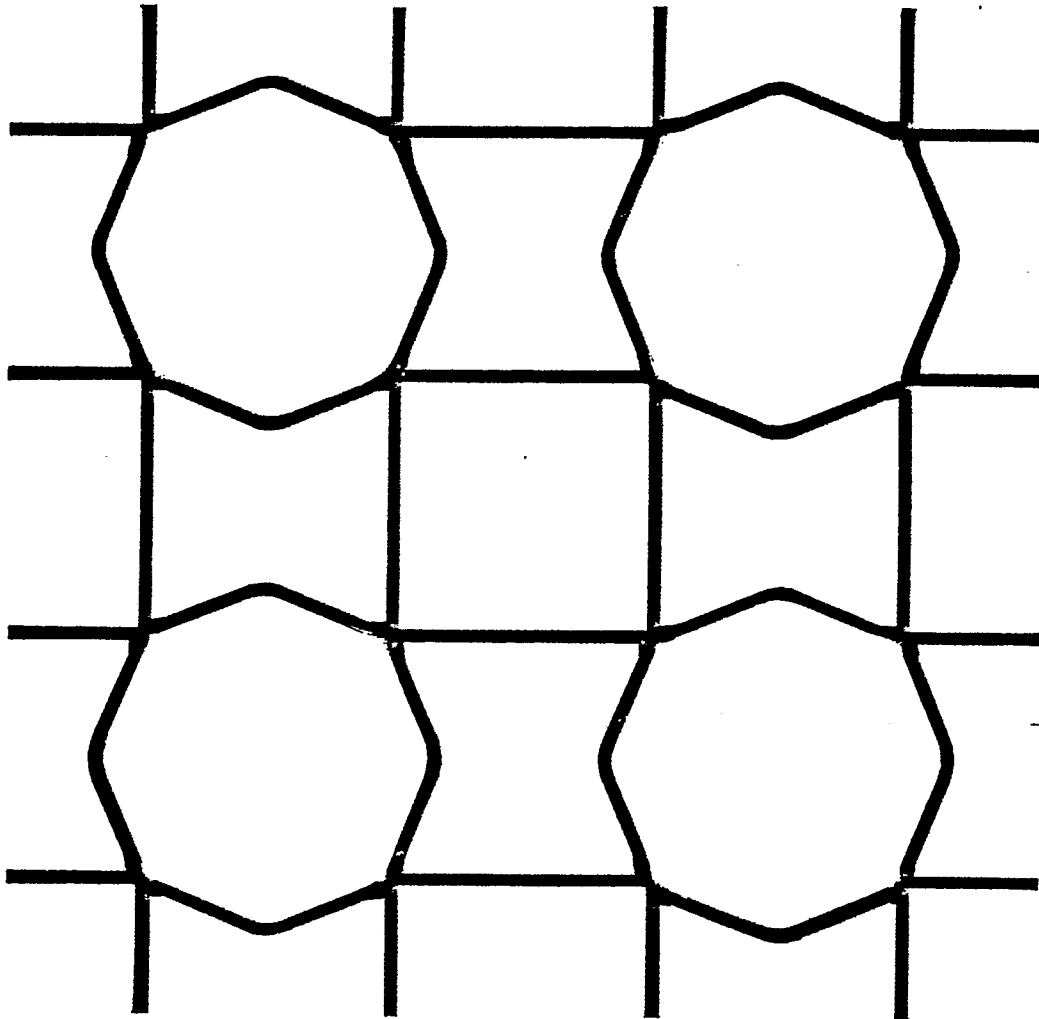


Fig. 8.

FIG. 9.

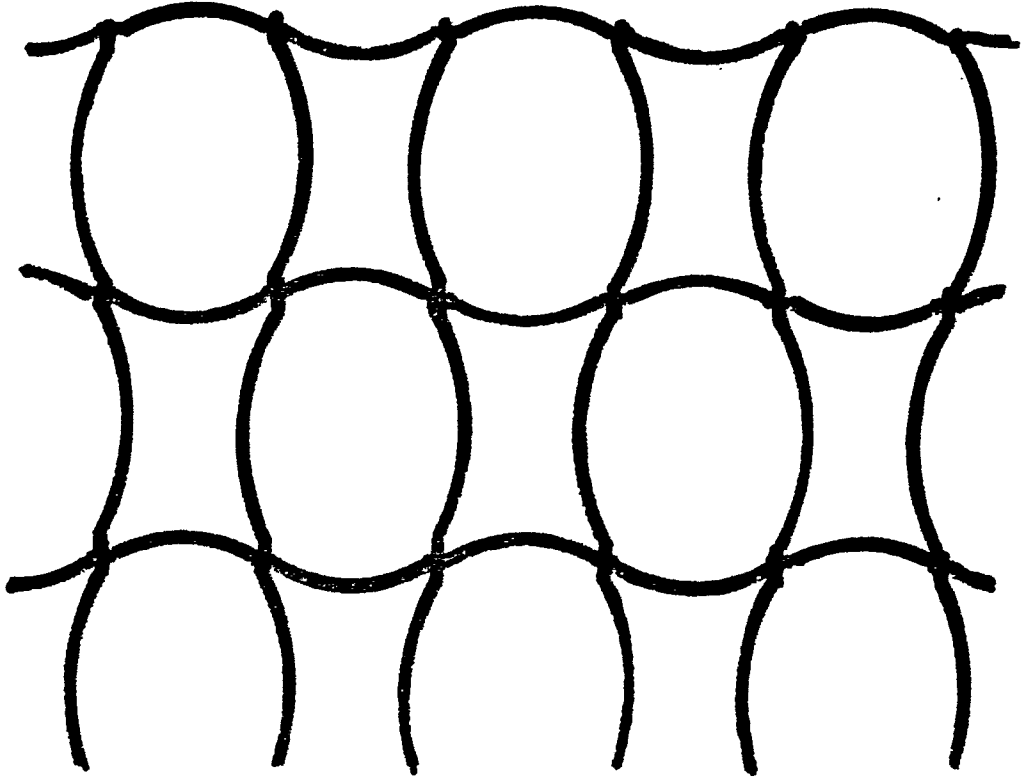
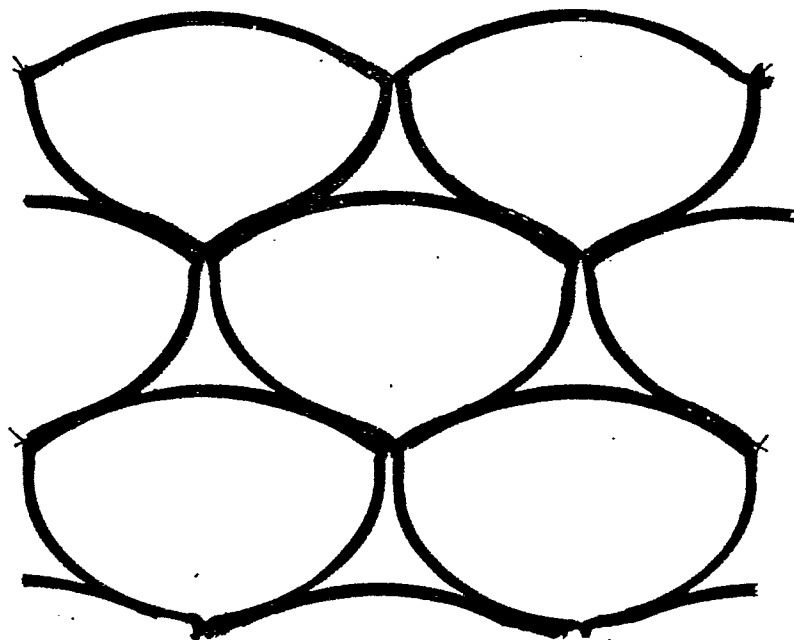


FIG. 10.





DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
X	US-A-2 175 066 (RILEY) * Page 2, left-hand column, lines 20-29,46-75; figures 1-7 *	1-4,6,9	B 21 F 27/10 B 21 F 33/00
X	--- US-A-2 164 481 (WATKINS) * Page 1, left-hand column, line 32 - right-hand column, line 19; page 2, left-hand column, lines 38-64; page 4, left-hand column, lines 46-75; figures 1,4-7 *	1-3,5,7,8,10	
A	--- GB-A-1 494 515 (BEKAERT) * Claims 1-4; figure 1 *		
A	--- DE-A-1 509 046 (BAU-STAHLGeweBE) * Figure 4 *		TECHNICAL FIELDS SEARCHED (Int. Cl.4) B 21 F E 04 H
A	--- US-A-1 816 381 (LAND) * Figures * -----		
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 03-04-1987	Examiner THE K.H.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			